

consultation for a long-term traveler to malaria-endemic areas should stress the severity of the disease, its signs and symptoms, and the need to seek care immediately if signs and symptoms develop. Travelers also can consider bringing a reliable supply of drugs to treat malaria (atovaquone-proguanil or artemether lumefantrine) if they are diagnosed with the disease (see Sec. 2, Ch. 5, Yellow Fever Vaccine & Malaria Prevention Information, by Country, and Sec. 5, Part 3, Ch. 16, Malaria).

### RISK FACTORS CONTRIBUTING TO INFECTION

Data suggest that malaria incidence increases, and use of preventive measures decreases, with increasing length of stay abroad. Among expatriate corporate employees in Ghana, adherence to malaria prophylaxis deteriorated with increasing duration of stay, and all employees who had been on the site for >1 year had abandoned prophylaxis. About half of the cohort only intermittently used insect repellent, and more than one-third never used repellent.

Even though most British expatriates from the UK Foreign and Commonwealth Office had good knowledge about malaria and its prevention strategies, they adhered to malaria prophylaxis <25% of the time; only 25% reported rigorous compliance, and 13% reported having contracted malaria. A recent GeoSentinel Global Surveillance Network analysis found that *Plasmodium falciparum* malaria was the most frequent diagnosis among ill returned expatriate workers, occurring in 6%, and was acquired most commonly in sub-Saharan Africa. Given the high risk for malaria among travelers in Africa, these data on long-term travelers and expatriates highlight worrisome risks and practices.

French service members deployed to the Central African Republic for 4 months in 2013 experienced malaria at a rate of 150 cases per 1,000 person-years. A survey found that prophylaxis compliance correlated positively with use of other prophylactic measures against malaria (e.g., insecticide-treated clothing, mosquito net use, taking prophylaxis at the same time every day), correct perception of malaria risk, favorable perception of prophylaxis effectiveness, and peer-to-peer reinforcement.

### CHEMOPROPHYLAXIS

A traveler residing in an area of continuous malaria transmission should continue to use malaria prophylaxis for the entire stay. Doxycycline has been well tolerated for long-term malaria prophylaxis in the military, and the Centers for Disease Control and Prevention (CDC) has no recommended limits on its duration of use for malaria prophylaxis. Peace Corps volunteers frequently use mefloquine during prolonged stays and have a discontinuation rate of 0.9%. Mefloquine might be appropriate for long-term prophylaxis in chloroquine-resistant areas because of its convenient weekly dosing, but concern has increased regarding its neuropsychiatric side-effect profile, especially because the FDA label indicates that neurologic side effects could persist.

Atovaquone-proguanil has shown good long-term tolerability in post-marketing surveillance, with a discontinuation rate of only 1% because of diarrhea; for long-term use, however, atovaquone-proguanil can be a more expensive option than other antimalarial drugs. Peace Corps volunteers prescribed atovaquone-proguanil adhered to prophylaxis better than did people given doxycycline and mefloquine. If extended (>5 years) use of chloroquine is planned, a baseline ophthalmic examination with biannual follow-up is recommended to screen for potential retinal toxicity.

Because of its convenient weekly dosing, the antimalarial drug tafenoquine appears to be a promising choice for long-term travelers; an association with vortex keratopathy might limit its use. Moreover, tafenoquine use should be avoided in people with documented glucose-6-phosphate-dehydrogenase (G6PD) deficiency, as well as in those who have not been tested for G6PD deficiency. It is also not recommended for use in people with a history of psychotic disorder. Pregnancy is a contraindication to tafenoquine use.

### PREGNANCY

The possibility of pregnancy requires careful consideration for travelers to areas where malaria is endemic (see Sec. 5, Part 3, Ch. 16, Malaria, and Sec. 7, Ch. 1, Pregnant Travelers). Malaria infection during pregnancy can result in severe complications to both mother and fetus. When pregnancy is anticipated, prophylaxis options might need to

be adjusted; explore the possibility of pregnancy with all long-term travelers of childbearing age before departure.

For a person who is pregnant or who plans to become pregnant during long-term travel, mefloquine is considered safe in all trimesters. Data from published studies in pregnant people have shown no increase in the risk for teratogenic effects or adverse pregnancy outcomes after mefloquine prophylaxis during pregnancy. Chloroquine also has been used long-term without ill effects on pregnancy. If a person traveling long-term is taking atovaquone-proguanil, doxycycline, or primaquine, they should discontinue their medication and begin weekly mefloquine (or chloroquine in those areas where it remains efficacious) for at least 3–4 weeks to build up a therapeutic blood level of mefloquine before attempting to conceive.

During the pretravel consultation, advise people of the potential risks associated with becoming pregnant while taking antimalarial drugs. Doxycycline, for example, is associated with fetal toxicity in animal studies, and its use is contraindicated during pregnancy. Primaquine and tafenoquine can harm a G6PD-deficient fetus, so should not be used. The effect of atovaquone-proguanil on the fetus is unknown.

## Other Parasitic Infections

Parasitic infections vary with location and include amebiasis, filariasis, giardiasis, cutaneous leishmaniasis, schistosomiasis, and strongyloidiasis; vectorborne infections (e.g., filariasis, cutaneous leishmaniasis) can be prevented by using insect bite precautions and protective clothing, and by avoiding locations where the vectors are prevalent (see Sec. 5, Part 3, Ch. 9, Lymphatic Filariasis, and Sec. 5, Part 3, Ch. 14, Cutaneous Leishmaniasis). For travelers with appropriate (or potential) geographic exposure risks, consider the possibility of filariasis and cutaneous leishmaniasis.

Travelers can avoid schistosomiasis by not bathing, swimming, or wading in fresh water, guidance that can be difficult to communicate to long-term travelers who, for example, might be living in sub-Saharan Africa and looking forward to river rafting or vacationing at a lake. Travelers can

prevent *Strongyloides stercoralis* and hookworm infections by not walking barefoot through soil or on sandy beaches. The risks for schistosomiasis and strongyloidiasis can increase with long-term travel; consider screening travelers on their return, and suggest that people with access to health care also seek screening during long-term expatriate assignments (for details, see Sec. 11, Ch. 3, ... *perspectives*: Screening Asymptomatic Returned Travelers). Although seropositivity appears to be generally low for many parasitic infections, seroconversion for *Schistosoma* spp. occurred in 6% of Dutch long-term travelers to endemic areas.

Avoiding unwashed or uncooked foods, including greens and vegetables, can help reduce a traveler's chances of ingesting foodborne parasites (e.g., *Ascaris*).

## Travelers' Diarrhea

Because diarrhea and gastrointestinal diseases occur commonly, educate long-term travelers about ways to manage gastrointestinal illnesses (see Sec. 2, Ch. 6, Travelers' Diarrhea), including rehydration, use of antimotility agents, empiric antimicrobial therapy, and knowing when to seek care.

Compared with short-term travelers, long-term travelers experience more chronic diarrhea and postinfectious irritable bowel syndrome, possibly because some become less adherent to food and water precautions over time. Advise travelers of the need to continue food and water precautions to reduce the risk for these conditions (see Sec. 2, Ch. 8, Food & Water Precautions).

## Tuberculosis

In destinations where the burden of tuberculosis (TB) is high, the risk of infection in travelers can rise to that of the local population, depending on their length of stay and closeness of contact with the local population. For long-term travelers, consider a baseline interferon- $\gamma$  release assay or a tuberculin skin test before travel, and repeat the same test after travel. TB screening is particularly important for health care workers or people working in hospitals, prisons, or refugee camps (see Sec. 5, Part 1, Ch. 23, ... *perspectives*: Testing Travelers for *Mycobacterium tuberculosis* Infection).



## INJURY

Because injuries are the leading cause of preventable death in travelers, educate long-term travelers about safety. Stress the importance of road and vehicle safety, and emphasize that travelers should choose the safest vehicle options available (see Sec. 8, Ch. 5, Road & Traffic Safety). Roads are often poorly constructed and maintained, traffic laws might not be enforced, vehicles might not have seatbelts or be kept in good condition, and local drivers might be reckless and minimally trained. See Sec. 4, Ch. 12, Injury & Trauma, for strategies to reduce the risk of traffic and other injuries.

## MENTAL HEALTH

Culture shock and the stress of long-term travel can trigger or exacerbate mental illness. Assess long-term travelers for a preexisting diagnosis of mental illness, depressed mood, recent major life stressors, and use of medications that can adversely affect mental health. Any of these conditions suggest a need for further screening.

Warn all long-term travelers against illicit drug use, and urge them to take care of their physical and mental health by exercising regularly and eating healthfully. Travelers should be able to recognize signs of anxiety and depression and have a plan for coping. Having photographs or other mementos of friends and family at hand, and staying in close contact with loved ones at home, can alleviate the stress of long-term travel (see Sec. 2, Ch. 12, Mental Health).

## LONG-TERM TRAVELERS WITH OPEN ITINERARIES

Offering pretravel care to long-term travelers, especially travelers with no itinerary or who have only vague travel plans, presents unique challenges. These travelers benefit from broad immunization coverage for all potential exposures to vaccine-preventable diseases.

Because their plans are unclear, these travelers must understand that they might need to

diagnose and treat themselves for common ailments, including musculoskeletal problems, upper respiratory tract infections, skin disorders, travelers' diarrhea, urinary tract infections, and vaginitis. For travelers (e.g., backpackers) who might go in and out of malaria-endemic areas, a sensible approach is to provide a supply of atovaquone-proguanil with instructions on how to take it when they visit risk areas.

In addition to strategies to prevent health problems and injuries during their long sojourns, traveler education is imperative regarding health resources, signs and symptoms that require urgent medical evaluation, and medical evacuation.

## SCREENING LONG-TERM TRAVELERS & EXPATRIATES AFTER RETURN

After returning to their country of origin, long-term travelers (e.g., highly adventurous travelers, expatriate workers, Peace Corps volunteers) ideally should have a thorough medical interview to assess potential infectious exposures. A careful itinerary-specific history with detailed questioning about potential high-risk exposures including animal, food and water, and human contacts is the foundation of the posttravel evaluation.

Conduct a physical examination focused on specific signs and symptoms, and a selected array of tests. These tests include a complete blood count with differential, hepatic transaminases, stool ova and parasite examination, and serologic markers depending on types of exposure, but most importantly for schistosomiasis and strongyloidiasis. Serologic testing can detect subclinical infections and help identify instances where treatment would be advised (see Sec. 11, Ch. 3, . . . *perspectives*: Screening Asymptomatic Returned Travelers). The posttravel evaluation also provides an opportunity for preventive counseling for potential future travel.

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# STUDY ABROAD & OTHER INTERNATIONAL STUDENT TRAVEL

Kristina Angelo, Sarah Kohl

Students travel internationally for many reasons, including studying abroad, leisure travel during a gap year, providing health care, or participating in humanitarian activities. During the 2018–2019 academic year, nearly 350,000 US students studied abroad, an increase of 1.6% from the previous year. Study abroad notably declined by 53.1% the following academic year (2019–2020) because of the coronavirus disease 2019 (COVID-19) pandemic. The most common destination for US students to study abroad is Europe, but they also study in low- or middle-income countries, placing them at risk for acquiring infectious diseases that are not endemic at home.

Gap year travel, or travel during a year off from academic studies, is increasingly popular and can also be associated with travel-related health risks. Medical, nursing, or veterinary

students studying abroad can be at increased risk for acquiring bloodborne pathogens or zoonotic infections, and students participating in humanitarian activities could experience stress-related problems and environmental hazards. The purpose of travel and the student's planned activities should be captured at the pretravel consultation as part of the risk assessment.

Resources for students preparing to travel abroad include their institution's study abroad program administrators, health care providers at a pretravel consultation, and other students who have returned from a similar trip (see Table 9-03 for additional, online study abroad resources). Appropriate preparation can help students stay healthy during travel and reduce the chances they will become ill or engage in behaviors abroad that can place their health at risk.



**Table 9-03** Online health & safety information for students, health care providers & study abroad program professionals

ORGANIZATION/SOURCE	RESOURCES PROVIDED	AVAILABLE FROM
Centers for Disease Control and Prevention	Country-specific health information	<a href="https://wwwnc.cdc.gov/travel">https://wwwnc.cdc.gov/travel</a>
	Before, during, and after travel tips for students	<a href="https://wwwnc.cdc.gov/travel/page/studying-abroad">https://wwwnc.cdc.gov/travel/page/studying-abroad</a>
The Center for Global Education, SAFETI (Study Abroad First-Educational Travel Information)	Videos on health issues (alcohol awareness) A–Z index on health and safety issues Course and workshops	<a href="http://globaled.us/SAFETI">http://globaled.us/SAFETI</a>
NAFSA: Association of International Educators	Study abroad program guidance	<a href="http://www.nafsa.org">www.nafsa.org</a>
Pathways to Safety International	Interpersonal and gender-based violence assistance	<a href="https://pathwaystosafety.org">https://pathwaystosafety.org</a>
US Department of State Bureau of Consular Affairs	Country-specific safety guidance Travel advisories with safety and security information	<a href="https://travel.state.gov">https://travel.state.gov</a>
	Special considerations for US students abroad	<a href="https://travel.state.gov/content/travel/en/international-travel/before-you-go/travelers-with-special-considerations/students.html">https://travel.state.gov/content/travel/en/international-travel/before-you-go/travelers-with-special-considerations/students.html</a>
US Department of State Overseas Security Advisory Council	Crime and safety reports Travel guidance Traveler toolkit	<a href="http://www.osac.gov">www.osac.gov</a>

## PREDEPARTURE PREPARATION

### Health Care Providers: Roles & Responsibilities

When conducting pretravel consultations with student travelers, cover the core topics of risk assessment, risk mitigation, and preparation to respond effectively to health and safety problems while abroad (see Sec. 2, Ch. 1, The Pretravel Consultation). Make recommendations about vaccines, prophylaxis and self-treatment medications, provide information on country-specific health risks, and give guidance on how to obtain medical and dental care while abroad. Remind students who will be traveling abroad for >90 days to fill any prescriptions for the duration of their

trip before they leave the United States and to pack a travel health kit (see Sec. 2, Ch. 10, Travel Health Kits).

Other relevant topics to discuss include alcohol and illicit drug use and dependency; blood-borne pathogen precautions (e.g., avoiding acupuncture, blood products, needles, piercings and tattoos, surgeries) while traveling; gender and sex-related health issues, including information for lesbian, gay, bisexual, transgender, queer (LGBTQ+) students; managing stress and other mental health issues associated with international travel (e.g., culture shock, altered sleep patterns, jet lag); and practicing safe sex, including what to do in the event of pregnancy. Share information on how to prevent unintentional injuries



(see Sec. 4, Ch. 12, Injury & Trauma). Provide additional recommendations for students with disabilities or special needs (see Sec. 3, Ch. 2, Travelers with Disabilities), students with pre-existing health conditions (see Sec. 3, Ch. 3, Travelers with Chronic Illnesses), and students participating in humanitarian activities (see Sec. 9, Ch. 5, Humanitarian Aid Workers).

Students should purchase travel insurance that covers major medical, evacuation, and repatriation (see Sec. 6, Ch. 1, Travel Insurance, Travel Health Insurance & Medical Evacuation Insurance); “study abroad” insurance plans might be available through the school or parent institution and could provide a reasonable, cost-effective option. Encourage student travelers planning adventure activities (e.g., kayaking, skydiving) to include extreme sports coverage on their health insurance policy (see Sec. 9, Ch. 11, Adventure Travel). All students should register with the Department of State’s Smart Traveler Enrollment Program (STEP, <https://step.state.gov/step>) and check the Centers for Disease Control and Prevention Travelers’ Health website destination pages (<https://wwwnc.cdc.gov/travel/destinations/list>) for destination-specific advice (e.g., best practices for disease prevention, outbreak information) before departure.

## Study Abroad Programs: Roles & Responsibilities

Study-abroad professionals should share instructions with students about whom to contact in the study abroad program in the event of emergency and nonemergency situations. If telehealth services are planned, the program should address internet connectivity and concerns about legal health jurisdiction prior to departure (see Sec. 2, Ch. 16, Telemedicine). The program might need contingency plans in the event of a disease outbreak or civil unrest. Study-abroad staff also should encourage students to familiarize themselves with codes of conduct for their home and host institutions, as well as local health and safety issues, cultural norms, laws, and political climate. Additionally, program staff should inform students and families about the responsibilities and qualifications of chaperones accompanying a study abroad program.

## SPECIFIC ISSUES

### Alcohol & Illicit Drugs

A lower minimum drinking age and cultural acceptability of alcohol consumption in the host country, combined with stress or mental health issues, can lead to increased alcohol consumption among students when abroad. Use and abuse of alcohol and illicit drugs pose serious health consequences, can increase the risk for accidents and injuries, and make students potential targets for crime and incarceration (see Sec. 3, Ch. 5, Substance Use & Substance Use Disorders). Moreover, availability or use of recreational drugs (e.g., cannabis) by citizens of host countries might not necessarily mean their use is legal for international travelers.

Although cannabis is legal under certain US state laws, its use continues to be illegal under US federal law. US airports and airlines operate under federal jurisdiction and, as such, do not recognize the medical marijuana laws or cards of any state. In countries outside the United States where cannabis is illegal, students found in possession of the drug—even those with a valid US prescription—can be arrested; if found guilty, they could be deported, fined, or imprisoned. The International Narcotics Control Board ([www.incb.org/incb/en/travellers/index.html](http://www.incb.org/incb/en/travellers/index.html)) has country-specific information for students with prescription medications containing controlled substances.

Both health care providers and study abroad program personnel should counsel students about the consequences of alcohol and illicit drug use. Study abroad programs should strongly discourage all illicit drug use. Advise students to drink alcohol responsibly and in moderation, and to seek medical attention if they feel ill after drinking.

### Bloodborne Pathogens

Students planning to provide medical, nursing, or veterinary care overseas should receive hepatitis B vaccination or have evidence of immunity. Inform these travelers about what to do in the event of a needlestick injury. At the pretravel consultation, consider providing postexposure HIV prophylaxis for students to take with them in the event of a bloodborne exposure if they



will be providing care in a country with high HIV prevalence (see Sec. 9, Ch. 4, Health Care Workers, Including Public Health Researchers & Medical Laboratorians). Psychological counseling is essential after an occupational blood-borne exposure. Provide information on blood safety in the event the traveler has an emergency or needs a blood transfusion (see Sec. 6, Ch. 2, Obtaining Health Care Abroad). Warn students of the risks associated with getting acupuncture, piercings, or tattoos while abroad; sterility of needles or ink cannot be guaranteed.

## Emergency Contact Information Card

Students should always carry their personal information and important telephone numbers as hard copies and electronically in their mobile devices. The Center for Global Education offers a printable sample emergency contact card at <http://studentsabroad.com/handbook/emergency-card.php?country=General>. For students with additional mental health or physical needs, provide written documentation of all health issues, prescribed medications, and recommended care plans; students should ensure that this letter gets translated accurately into the local language(s). Students should leave photocopies of all travel documents at home with their emergency contacts and the study abroad program office.

## Gender-Related Issues

Students, including those who self-identify as LGBTQ+, should familiarize themselves with cultural attitudes, local laws, and tolerance of gender identification and sexuality in their host country (see Sec. 2, Ch. 13, LGBTQ+ Travelers). Check the US Department of State website (<http://travel.state.gov>) and specific US embassy or consulate websites in countries and cities around the world ([www.usembassy.gov](http://www.usembassy.gov)) to obtain information on host country laws.

The International Lesbian, Gay, Bisexual, Trans, and Intersex Association (ILGA World) publishes a map of sexual orientation laws by country, including protection against discrimination and criminalization of same-sex sexual acts (<https://ilga.org/maps-sexual-orientat>

ion-laws). Additional research and planning might be needed to identify health care providers in the host country with experience working with LGBTQ+ people, if needed.

## Mental Health

International travel can be stressful for students who might be inexperienced travelers, reliant on their home support systems, or traveling for longer periods of time. Culture shock, fear, insecurity, isolation, and loneliness can exacerbate existing mental health issues or unveil new ones (see Sec. 2, Ch. 12, Mental Health). When deciding on a destination for study, students should consider their preexisting level of mental (and physical) well-being and the availability of local resources. Encourage students to take an active role in planning for care abroad by disclosing all chronic mental health conditions and support needs during the pretravel consultation, and to the study abroad program office before departure.

Advise students to continue their routine medications while abroad; assist with developing a plan to manage a flare of symptoms while traveling (e.g., seeking local care, consulting with current providers, repatriation in the event of severe mental health issues). Students should confirm that mental health services are covered by their travel health insurance. Recommend that students engage in self-care abroad by getting regular exercise, establishing good sleep patterns, joining interest groups, and maintaining contact with family and friends at home.

## Safer Sex

Discuss safer sex practices (e.g., birth control, condom use, emergency contraception, HIV preexposure prophylaxis [PrEP]) with international student travelers and provide information about the prevalence of sexually transmitted infections (STIs) at their destination. Students should follow local social norms about public displays of affection and dating to avoid possible adverse consequences; they also should be empowered to report any episode of sexual harassment or assault to local authorities, emergency contacts, and the study abroad program.

## DURING & AFTER TRAVEL CONSIDERATIONS

During their time abroad, students should seek health care immediately if they become ill, injured, or have a bloodborne pathogen exposure. Students should adhere to food and water precautions (see Sec. 2, Ch. 8, Food & Water Precautions), and use insect repellent (see Sec. 4, Ch. 6, Mosquitoes, Ticks & Other Arthropods) to prevent vectorborne diseases.

Students who become ill after returning home should alert health care providers about their international travel. Students with fever  $\leq 1$  year after returning from study or travel in

malaria-endemic areas (see Sec. 2, Ch. 5, Yellow Fever Vaccine & Malaria Prevention Information, by Country, and Sec. 5, Part 3, Ch. 16, Malaria) merit testing for malaria. Students with new sexual partners while abroad should be tested for STIs, including chlamydia, gonorrhea, HIV, and syphilis if they develop symptoms while abroad; they also should be screened for STIs when they return home.

After returning home, students will undergo a period of readjustment. All students should have access to mental health services after return to help cope with events that occurred overseas and to assist with reverse culture shock.

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# VISITING FRIENDS & RELATIVES: VFR TRAVEL

Danushka Wanduragala, Christina Coyle, Kristina Angelo, William Stauffer

In this book, a “visiting friends and relatives (VFR) traveler” is defined as a person who currently resides in a higher-income country who returns to their former home (in a lower-income country) for the purpose of visiting friends and/or relatives. More broadly, family members (e.g., children, partners) born in the VFR traveler's higher-income country of residence are also included in this traveler category.

Migration patterns to the United States over the past 30 years have resulted in increasing numbers of immigrants arriving from Africa, Latin America, and Asia. Approximately 14% of US residents ( $\approx 45$  million people) are foreign born, and  $\approx 45\%$  of all overseas international travelers

coming from the United States list VFR as their reason for travel.

## DISPROPORTIONATE INFECTIOUS DISEASE RISKS

Compared to other groups of international travelers, VFR travelers experience a greater incidence of travel-associated infectious diseases (e.g., hepatitis A, malaria, sexually transmitted infections, tuberculosis, typhoid fever). Several underlying reasons for this observation have been identified (see Box 9-07). VFR travelers are a heterogeneous and complex group, however, and assumptions based on population generalizations are not appropriate.





## BOX 9-07 **Reported reasons travelers visiting friends and relatives (VFR) are at increased risk for travel-associated infections & diseases**

### **CULTURAL & SOCIETAL BARRIERS**

Cultural and language discordance between local travel health care providers and members of the VFR community.

Immigration status concerns among members of the VFR community.

Lack of awareness of travel medicine among members of the VFR community.

Mistrust of the local medical system among members of the VFR community.

### **HEALTH CARE PROVIDER-DEPENDENT BARRIERS**

Lack of knowledge of malaria prevention, identification, and treatment.

Underlying unconscious bias and racism (negative social-political determinants of health).

### **LOGISTICAL BARRIERS**

Financial barriers, including lack of insurance coverage.

Lack of access (travel health clinics not located in areas where VFR travelers live; less marketing and outreach to VFR communities).

### **UNIQUE ELEMENTS OF VFR TRAVEL**

Duration: VFR travelers might stay at their destination longer than tourists or other travelers going to the same area.

Infectious diseases: VFR travelers might travel more frequently to destinations with high disease endemicity and increased exposure risk.

Last-minute and emergency travel: VFR travelers might need to make sudden travel plans to visit ill family members or attend funerals.

Other features that place VFR travelers at increased risk for travel-associated illness:

- Less likely to use insect bite precautions (e.g., insect repellent, mosquito nets, protective clothing).
- More likely to stay in the community and at homes of friends and relatives.
- Participation in daily family and community activities (e.g., drinking tap or untreated water, sharing locally prepared foods).

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As with any other international traveler, conduct individualized counseling and recommendations after thoroughly discussing and evaluating the VFR traveler's existing knowledge and beliefs about travel health, in combination with their specific travel characteristics and plans. Exploring the nuanced cultural considerations of the individual traveler is instrumental to providing more effective travel recommendations.

## **Malaria**

As noted, several travel-associated infectious diseases occur at disproportionately high rates in VFR travelers. Box 9-07 highlights multiple reasons for this (e.g., barriers to receiving appropriate pretravel care, unique features of VFR travel), reasons that have been best studied for malaria. Although the global burden of malaria has been decreasing, malaria importation into the United States has been increasing in recent years; 2,161 confirmed imported cases were reported in 2017, the highest number in 45 years. Of these cases,

73% occurred among VFR travelers; 86% were imported from Africa, and 67% of African cases originated in West Africa. These figures are supported by data collected from the GeoSentinel global surveillance network clinics during 2003–2016, which showed that 53% of returned travelers diagnosed with malaria were VFR travelers, 83% of whom acquired their disease in sub-Saharan Africa.

Although VFR travelers who were born abroad experience a greater incidence of malaria infection than other international travelers, severe disease and death from malaria among this population has historically been lower than in tourists and business travelers, possibly because of preexisting immunity. VFR travelers are, however, still vulnerable to severe malaria; 55% of malaria hospitalizations in 2017 occurred in this population, and deaths also are reported. For instance, VFR travelers accounted for 5/5 reported malaria deaths in 2014 and 5/11 deaths in 2015.

Timely recognition and prompt delivery of appropriate treatment are critical to improving outcomes in malaria patients. Misdiagnoses by health care providers from nonendemic regions who lack familiarity with the disease have been reported, leading to delays in therapy. Potential misdiagnosis underscores the need for VFR travelers to carefully adhere to chemoprophylaxis and other malaria prevention strategies.

The same factors that lead to a greater incidence of travel-associated infectious diseases among VFR travelers generally, also contribute to an increased risk for malaria in VFR travelers going to Africa. Although VFR travelers' knowledge, attitudes, and practices (KAPs) have been widely reported in the literature, little systematic or rigorous data are published that provide evidence that KAPs differ substantially between VFR and other traveler groups. More recent studies contradict the traditional narrative that VFR travelers are less concerned than other travelers about the possibility of malaria infection. In fact, VFR travelers have equal or more concern about malaria, but existing barriers mean they are less able to act on those concerns.

## Other Infections & Conditions

During 2012–2016, about half of all typhoid and paratyphoid A cases in the United States occurred in VFR travelers, mostly those returning from southern Asia. Most isolates were resistant or showed decreased susceptibility to antimicrobial agents like fluoroquinolones.

VFR travelers aged <15 years are at greatest risk for hepatitis A; children and adolescents often have asymptomatic infections. A Canadian study found that 65% of hepatitis A cases occurred in VFR travelers aged <20 years; and in a Swedish study of 636 cases of imported infection, 52% were in VFR travelers, of whom 90% were <14 years old. Other travel-associated infections (e.g., hepatitis B, measles) also occur more commonly in young VFR travelers.

As a group, VFR travelers may be more likely than others to travel internationally while pregnant or at extremes of age, risk factors that can predispose to more severe outcomes from certain infections. For example, malaria during pregnancy is associated with higher morbidity and mortality,

and exposure to Zika virus during pregnancy can result in serious fetal and infant complications. The very young and the elderly can have unusual clinical presentations of infections and worse outcomes. For instance, infants develop tuberculosis meningitis more commonly than people in other age groups, and older age is associated with more severe coronavirus disease 2019 (COVID-19) outcomes.

## PRETRAVEL HEALTH COUNSELING

VFR travelers are more likely to seek travel health advice from a primary care clinic than from a travel medicine specialty clinic. Primary care clinics should ensure clinical staff are able to provide basic travel health information and services, and should create systems and working relationships with travel health experts for consultation and referral when appropriate. Primary care and travel clinics can employ various strategies to reach and better serve VFR populations (Box 9-08).

In addition, certain health risks and prevention recommendations might vary or deserve special attention for VFR travelers. Increase awareness among VFR travelers regarding their unique risks for travel-associated infections, and develop strategies to help overcome the barriers they face in accessing and acquiring travel health services. One possible approach is to provide VFR travelers with a comparison of the effect and cost of contracting certain diseases versus the cost of taking preventive measures.

## Malaria Prevention

Encourage VFR travelers going to malaria-endemic areas to take prophylactic medications, but also remind them of the benefits of barrier methods of prevention (e.g., insect repellents, mosquito nets, protective clothing), particularly for children (see Sec. 4, Ch. 6, Mosquitoes, Ticks & Other Arthropods). Social pressures from host families can dissuade VFR travelers from implementing effective prevention techniques (e.g., using insect repellents and mosquito nets, staying indoors during periods of peak mosquito feeding). Discuss any potential concerns, and provide viable alternative options (e.g., clothing pre-treated



## BOX 9-08 Improving outreach & service to VFR travelers: recommendations for clinics

**PRIMARY CARE CLINICS** (VFR travelers disproportionately seek care at primary care clinics vs. travel medicine clinics)

Ensure clinicians receive continuing education in travel health and travel medicine.

Provide clinicians access to essential travel medicine information (e.g., CDC Yellow Book, Heading Home Healthy, UpToDate).<sup>1</sup>

Establish systems and relationships with travel medicine experts and infectious diseases specialists for consultation and referral.

### TRAVEL MEDICINE SPECIALTY CLINICS

Conduct outreach to local communities:

- Give talks to community or faith groups on travel medicine with Q&A sessions.
- Meet with VFR community leaders.
- Use various forms of media for outreach (e.g., volunteer for community radio call-in programs to discuss travel health).

Consider adding evening and weekend appointments to the clinic schedule; reserve time slots for last-minute, emergency travel, and returned travelers who are ill.

Create a welcoming clinic environment:

- Decorate with artwork and provide reading materials from countries and cultures of the VFR communities being served.
- Provide an area for prayers.
- Provide language-accessible educational materials.

Encourage patients to “shop around” for the lowest price medications and to purchase in the United States before departing.

Encourage local pharmacies and health systems in areas with greater need to stock appropriate chemoprophylaxis agents.

Ensure VFR travelers have adequate supplies of travel medicines (e.g., malaria chemoprophylaxis):

- Direct pharmacists to call if the VFR traveler is not filling the entire prescription.
- Include travel duration on all travel medicine prescriptions.
- Provide cards to help patients advocate for themselves at pharmacies.<sup>2</sup>

### BOTH PRIMARY CARE & TRAVEL MEDICINE CLINICS

Help patients navigate the healthcare system (e.g., assist in making appointments at appropriate clinics, help arrange transportation).

Increase access to professional medical interpreters; train staff how to use interpreters.

Provide culturally and linguistically appropriate educational materials in audio, video, and written formats.

Train clinical staff and health care providers about conscious and unconscious bias, health equity, and to practice cultural humility.

<sup>1</sup>Centers for Disease Control and Prevention Yellow Book (<https://wwwnc.cdc.gov/travel/page/yellowbook-home>); Heading Home Healthy ([www.HeadingHomeHealthy.org](http://www.HeadingHomeHealthy.org)); UpToDate ([www.uptodate.com](http://www.uptodate.com)).

<sup>2</sup>See the self-advocacy information card developed by the Minnesota Department of Health in collaboration with a West Africa Community Advisory Board to help VFR travelers obtain affordable antimalarial drugs. Available from: [www.health.state.mn.us/diseases/travel/medcost.pdf](http://www.health.state.mn.us/diseases/travel/medcost.pdf).

with insect repellents, odorless repellents, free-standing mosquito nets).

### MALARIA CHEMOPROPHYLAXIS

Due to cost and other disincentives to purchasing malaria chemoprophylaxis in the United States, VFR travelers frequently report they plan to buy these drugs overseas. Substandard malaria chemoprophylaxis drugs are common, however, in certain low- and middle-income countries; in addition, these drugs are a frequent target for drug counterfeiting (see Sec. 6, Ch. 3, . . . *perspectives*:

Avoiding Poorly Regulated Medicines & Medical Products During Travel). Moreover, because of greater familiarity with products available for purchase at their destination, VFR travelers might favor or endorse a drug that is either inappropriate or contraindicated for use. Counsel against using drugs for which there is documented resistance (e.g., chloroquine, proguanil monotherapy) or that are used for malaria treatment (e.g., artesunate, quinine-based drugs) and not prophylaxis.

For all the above reasons, educate travelers about the risks associated with taking medicines

acquired abroad, and advise them to obtain their medications in the United States prior to travel. Recent research has shown the price for the exact same prescription of most common antimalarial drugs can vary greatly among different pharmacies in the same area. Encourage VFR travelers to comparison shop and assist them in finding the best drug price. The Minnesota Department of Health has developed a self-advocacy information card (see [www.health.state.mn.us/diseases/travel/medcost.pdf](http://www.health.state.mn.us/diseases/travel/medcost.pdf)) with a West Africa Community Advisory Board to help VFR travelers obtain affordable antimalarial drugs.

Patients also can contact their health insurance provider to learn whether prescription coverage can be extended due to a longer trip. Clinicians can include a note to “notify the prescriber if entire prescription is not filled,” and assist the pharmacy and patient to resolve any issues.

## Vaccinations

Travel vaccine recommendations and requirements for VFR travelers are the same as those for other travelers. In addition, establish whether VFR travelers, particularly those born outside the United States, have had routine childhood immunizations (e.g., diphtheria-tetanus-pertussis; measles-mumps-rubella) or a clinical history of vaccine-preventable diseases (e.g., varicella).

In the absence of documentation of immunizations, consider adult travelers susceptible and offer age-appropriate vaccinations. Alternatively, perform serologic studies to demonstrate proof of immunity when documentation is lacking (but suspicion of a completed vaccination series is high), or when clinical or epidemiological evidence to suspect prior infection is present.

Although vaccine recommendations for VFR travelers do not differ substantially from those

### BOX 9-09 Vaccinating VFR travelers: caveats & recommendations

#### HEPATITIS A

Hepatitis A infection is common in childhood in low- and middle-income countries (see Sec. 5, Part 2, Ch. 7, Hepatitis A). After infection, natural immunity is life-long. Due to changing epidemiology, however, do not assume immunity to hepatitis A; many young adults and adolescents from low- and middle-income countries are susceptible and should be vaccinated.

#### HEPATITIS B

Hepatitis B infection is common in most immigrant groups. Because of routine immunization recommendations in the United States, at-risk immigrants might have a record of receiving hepatitis B vaccination but might not have been screened for chronic infection prior to vaccination. If a patient is at risk for hepatitis B (born or resided in a country with  $\geq 2\%$  prevalence), and no record of a negative test for hepatitis B chronic infection is available, screen for chronic infection (hepatitis B antigen testing) regardless of vaccine status (see Sec. 5, Part 2, Ch. 8, Hepatitis B).

#### VARICELLA

Varicella infection occurs later in life in the tropics, and rates of death and complications from varicella disease are higher in adults than in children. Do not assume immunity; perform immunization or antibody testing if no clear clinical history of infection is apparent.

#### OFF-LABEL VACCINE USE

Experienced providers familiar with the literature may consider off-label use of vaccines for high-risk pediatric VFR travelers when the benefit is felt to outweigh the risk (e.g., measles-mumps-rubella in children <12 months old, typhoid in children <2 years old). See Sec. 7, Ch. 3, Traveling Safely with Infants & Children, and Sec. 7, Ch. 4, Vaccine Recommendations for Infants & Children.

#### PRETRAVEL SCREENING FOR CHRONIC INFECTIONS

Use pretravel VFR consultations as an opportunity to screen for common chronic infections (e.g., hepatitis B, hepatitis C, HIV, schistosomiasis, strongyloidiasis, latent tuberculosis). For more information, see Guidance for the US Domestic Medical Examination for Newly Arriving Refugees ([www.cdc.gov/immigrantrefugeehealth/guidelines/domestic-guidelines.html](http://www.cdc.gov/immigrantrefugeehealth/guidelines/domestic-guidelines.html)) and Sec. 11, Ch. 11, Newly Arrived Immigrants, Refugees & Other Migrants.

#### ROUTINE HEALTH CARE VISITS: PLANNING AHEAD

Use routine health care visits for children and adults as an opportunity to ask about future travel plans. Offer travel vaccines, advice, and recommendations.



of other travelers, important specific caveats are listed in Box 9-09.

## RESOURCES FOR HEALTH CARE PROVIDERS

### Heading Home Healthy

The Heading Home Healthy program ([www.HeadingHomeHealthy.org](http://www.HeadingHomeHealthy.org)), supported by the Centers

for Disease Control and Prevention, focuses on reducing travel-related illnesses in VFR travelers. The program was developed to provide VFR travelers with resources for safe travel and includes videos, informational resources, and health tools in multiple languages. Heading Home Healthy also offers a clinical support tool for primary care health providers who are preparing their patients to travel home safely.

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## 9

# MASS GATHERINGS

Joanna Gaines, Kristina Angelo

Mass gatherings are typically defined as large numbers of people (>1,000) at a specific location, for a specific purpose. Practically speaking, a mass gathering can be any assembly of people large enough to strain local resources. Travelers to mass gatherings face unique risks because these events are associated with environmental hazards, challenging security situations, and increased opportunity for infectious disease transmission due to the influx of attendees, crowding, and poor hygiene from temporary food and sanitation facilities. Although the coronavirus disease 2019 (COVID-19) pandemic caused the cancellation or postponement of numerous mass gatherings, a growing

number are being held, with mixed public health consequences.

## MASS GATHERING CHARACTERISTICS

International travelers and their medical providers should understand the characteristics of mass gatherings. Some can be spontaneous (e.g., political protests); others are planned events. Some mass gatherings regularly occur at different locations (e.g., the Olympic Games, the Fédération Internationale de Football Association [FIFA] World Cup); other gatherings recur in the same location (e.g., Hajj, the annual Islamic pilgrimage to Mecca [see Sec. 10, Part 1, Ch. 2, Saudi Arabia:



Table 9-04 Examples of international mass gathering events

EVENT TYPE	EVENT NAME	HOST COUNTRY	TYPICAL ATTENDANCE
Religious	Hajj	Saudi Arabia	2.5 million
Sporting	FIFA World Cup 2022	Qatar	3 million
Cultural (arts/music)	Carnival	Brazil (also worldwide)	7 million
Business	EXPO 2023	Argentina	>5 million

Hajj & Umrah Pilgrimages]). Table 9-04 provides a brief representative list of mass gatherings, including type (religious observance, sporting event, or art and music festival), location, and typical attendance numbers. Most mass gatherings can be described effectively in terms of their activities, capacity, duration, location, participants, purpose, size, timing, and venue (see Table 9-05).

MASS GATHERING–ASSOCIATED HEALTH CONCERNS

Attendance at a mass gathering can exacerbate a traveler’s existing medical conditions. Emergency medical services often are involved in preparations for gatherings, and are usually equipped to address acute medical conditions (e.g., asthma, gastrointestinal issues, injuries, myocardial infarction). Onsite healthcare providers are usually capable of handling gathering-associated conditions (e.g., dehydration, heat exhaustion, hypothermia, sunburn).

Catastrophic Incidents

Catastrophic incidents are of particular concern during mass gatherings, especially with extremely dense crowds. Numerous casualties have occurred at mass gatherings due to poor crowd management, structural collapses, fires, and violence. Crush injuries and death can result from crowding and stampedes. At the 2015 Hajj pilgrimage in Saudi Arabia, for example, thousands of pilgrims died in a stampede; in 2021, dozens of pilgrims, including children, were killed during a stampede at an annual Lag BaOmer festival in Israel.

Ensuring personal safety during mass gatherings is necessary. Travelers should remain aware of their surroundings. Although the risk for

large-scale incidents (e.g., terror attacks) are low, they are impossible to predict or eliminate (see Sec. 4, Ch. 11, Safety & Security Overseas).

Infectious Diseases

Mass gathering attendees are at risk for infections, including vaccine-preventable illnesses (e.g., COVID-19, influenza, pneumococcus). Past mass gatherings have been associated with outbreaks of influenza, meningococcal disease, and norovirus. Mass gatherings also have implications for global health security.

Travelers who import infectious diseases to mass gathering host sites can infect both their fellow attendees and local organizers who, in turn, can become sources of infection to others. In this way (and depending on routes of transmission, incubation periods, and other disease-specific factors) concentrations of people attending mass gatherings facilitate the amplification of a disease. Participants can then export the illness internationally to destinations other than the host location. For emerging diseases, little might be known at first about all the various routes of transmission or consequences of infection. When Zika initially emerged in 2015 in Brazil, for example, shortly before the country hosted the Olympic and Paralympic Games, the potential for sexual and vertical transmission of the virus was unknown.

CORONAVIRUS DISEASE 2019

COVID-19 poses a unique risk for both travelers to mass gatherings and for the countries hosting mass gathering events, due to the influx of international attendees, varied country-specific immunization practices and vaccine access, and difficulty enforcing mask use or physical

**Table 9-05** Mass gatherings: characteristic features & potential risks

FEATURE	POTENTIAL RISK CONSIDERATIONS
ACTIVITIES	Some activities can be risky or strenuous (e.g., walking long distances in extreme temperatures) or could involve alcohol or drug use.
CAPACITY	Hosts differ in their ability to detect, respond to, and prevent public health emergencies. Understanding health outcomes previously associated with a recurring mass gathering can help travelers prepare for future events. Security arrangements vary.
DURATION	The longer an event lasts, the more likely local resources will be depleted and become strained.
LOCATION	Environment and infrastructure affect health and safety of events; some host countries and cities have better natural or engineered resources to handle large numbers of people than others.
PARTICIPANTS	Attendees can represent a unique demographic (e.g., religious, political groups), or vary by gender or age (e.g., older adults attempting to complete a religious pilgrimage toward the end of their life).
PURPOSE	Mass gatherings can be political, religious, social, or athletic events. The purpose of an event can determine the activities and affect the mood of participants.
SIZE	The density of crowds, not just the number of attendees, contribute to health and safety risks. More densely packed crowds can facilitate disease spread or induce riots or crowd crush disasters.
TIMING	Mass gatherings and local capacity are affected by the timing of an event. Season / weather can influence the number in attendance which affects the host's ability to organize a safe mass gathering.
VENUE	Indoor versus outdoor events create different sets of challenges for mass gathering organizers. Food, water, housing, and sanitation, can be of varying quality.

distancing. Logistics related to staff safety, visitor safety, site circulation (e.g., queuing), event location (e.g., indoor vs. outdoor), commerce (e.g., food and beverage venues), and sanitation (e.g., availability, location, and number handwashing stations) are among the issues to be considered when planning or visiting an event during the pandemic.

COVID-19 has impacted recommendations and requirements for all international travelers, including mass gathering attendees. Some countries require travelers to demonstrate proof of vaccination (including  $\geq 1$  booster dose) against COVID-19, prior to entry. Others may require

mandatory quarantine periods for those not vaccinated. Travelers should check with local health authorities at their intended destination to ensure they are aware of the most current requirements.

## CLINICIAN GUIDANCE

### Risk Assessment

#### ACTIVITIES & ITINERARIES

Ask travelers about their activities and itineraries. Verify a traveler's itinerary to identify risks at the destination, in addition to those associated with the event itself. Travelers might add side trips or extend travel beyond the mass gathering.

## PATIENT CHARACTERISTICS

Consider the patient's unique characteristics. Chronic health conditions can be exacerbated while participating in a mass gathering. Counsel patients on the importance of having adequate supplies of medication for the duration of their trip, and documentation for any prescriptions.

## Risk Mitigation

### VACCINES

Encourage vaccination. Ensure that travelers have all appropriate pretravel vaccinations, including routine and required vaccines, and are up to date with their vaccinations against COVID-19 ([www.cdc.gov/coronavirus/2019-ncov/vaccines/stay-up-to-date.html](http://www.cdc.gov/coronavirus/2019-ncov/vaccines/stay-up-to-date.html)).

### REQUIREMENTS

Identify requirements for mass gathering attendees beyond those required for entry to a country. For example, whereas Saudi Arabia mandates that all participants in the Hajj be vaccinated against meningococcal disease, this requirement

does not apply to other travelers visiting the country.

## RECOMMENDATIONS

In addition to any host-country requirements, some destinations and venues can have additional recommendations for mass gathering attendees based on public health concerns (e.g., demonstrating proof of COVID-19 vaccination). Be prepared to identify and provide needed pretravel health services based on host-site recommendations.

### PROVIDE EDUCATION & GUIDANCE TO TRAVELERS

Educate travelers on preventive measures, including regular application of sunscreen and insect repellent or advice on how to choose safe food and water from vendors. Emphasize the importance of regular handwashing with soap and water and the use of hand sanitizer with ≥60% alcohol content when sanitation facilities are not available. Box 9-10 is a checklist for travelers to use as they plan to attend a mass gathering.

## BOX 9-10 Mass gathering events: a planning checklist for travelers

### ☐ CHECK HOST NATION REQUIREMENTS

In addition to the entry requirements of the host nation, become informed about all requirements for participating in the mass gathering (e.g., medical tests, proof of vaccination, use of smartphone applications).

### ☐ SEE A TRAVEL MEDICINE PROVIDER

Make an appointment to see a travel medicine specialist at least 4–6 weeks before travel—this should allow enough time for you to receive most of your necessary vaccinations.

Discuss your itinerary and any planned activities with the provider—this will allow your provider to make more accurate recommendations to ensure your health and safety.

Discuss your medical history with the travel medicine specialist—some travel medicines might not be safe to take with medicines you take regularly.

If a travel medicine provider is not locally available, a primary care provider should be able to ensure you have adequate vaccinations and the health information necessary.

### ☐ SEE YOUR REGULAR HEALTH CARE PROVIDER

Work with your regular health care provider to make sure existing medical conditions are well controlled before you leave.

Ensure you have an adequate supply of all your regular prescription medicines prior to departure.

### ☐ REGISTER WITH THE US DEPARTMENT OF STATE'S SMART TRAVELER ENROLLMENT PROGRAM (STEP, <https://step.state.gov/step>)

STEP provides travelers with notifications (e.g., travel warnings, travel alerts, other destination-specific information).

STEP also makes sure that the State Department can find you if you experience serious legal, medical, or financial difficulties overseas.

In case of emergency at home, STEP can help friends and family contact you.

### ☐ VISIT THE CENTERS FOR DISEASE CONTROL AND PREVENTION (CDC) TRAVELERS' HEALTH WEBSITE (<https://wwwnc.cdc.gov/travel>)

Learn more about health and safety issues at specific destinations.

Find out if CDC has posted any Travel Health Notices for your destination or mass gathering event.



## STAY CURRENT

The Centers for Disease Control and Prevention regularly updates its Travelers' Health website (<https://wwwnc.cdc.gov/travel>) with Travel

Health Notices (notifications of disease outbreaks in countries around the world) and information on select mass gatherings (e.g., Hajj, the Olympic Games).

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# ADVENTURE TRAVEL

Christopher Van Tilburg

9

Adventure travel is unique because of challenging terrain, extreme weather, remote locales, and longer durations. Popular adventure travel destinations include trekking to Everest Base Camp, climbing Mount Kilimanjaro, hiking the Inca Trail, sailing the South Pacific, touring the Galápagos, and exploring the North and South Poles. Adventure travel can include activities like

backpacking, cycling, diving, mountaineering, river rafting, skiing, and surfing. Adventure travelers could be conducting scientific research, providing humanitarian relief, or climbing mountains or driving overland as part of an expedition.

As compared to other types of travel, risk for illness and injury with adventure travel is much greater for several reasons (see Box 9-11). Risk for

### BOX 9-11 Adventure travel–associated risk factors for illness & injury

Climate, terrain, and weather can be extreme.

Communication often is limited, even with modern technology.

Destinations can be remote and lack access to care.

Travelers exert themselves physically, increasing caloric, fluid, and sleep requirements.

Trips are often long, spanning several weeks, months, or years.

Trips are often goal oriented, which can cause travelers to exceed safety limits and take increased risks.

Unexpected complications can occur with flight schedules, vehicle breakdowns, weather delays, and other factors.

travel-associated illness and injury is a function of 2 variables: probability and consequence. The probability of a mishap occurring is based on the frequency (“how often”), duration (“how long”), and severity (“how bad”) of the hazards encountered; during adventure travel, each is increased. Objective hazards include difficult environmental conditions (e.g., terrain, weather). Dehydration, poor nutrition, and insufficient sleep are examples of subjective or human-controlled hazards.

Consequence, the second variable, is a measure of the outcome or result of an illness or injury. In adventure travel, where conditions are often austere and access to definitive care is remote, even if the probability of a mishap occurring is low, the consequences are nearly always magnified. Minor injuries or illnesses happening in the wrong setting can be disastrous.

Major accidents are rarely due to a single event. Multiple events usually occur in sequence preceding an accident. Travelers should be vigilant about the probability and consequence of risk, and try to make good decisions before they get into trouble.

## PRETRAVEL CONSIDERATIONS

During the pretravel consultation, in addition to providing routine travel medicine advice, gather extra information and discuss precautions for wilderness and expedition travel. Several excellent wilderness medicine resources exist, including conferences, journals and textbooks, and professional societies (e.g., the Wilderness Medical Society; [www.wms.org](http://www.wms.org)).

### Trip Type

When talking with adventure travelers, obtain details about the type, length, and remoteness of the trip. Guided trips could eliminate some of the need for complex logistics planning on the part of the traveler. Even with guided trips, though, participants should still ask trip organizers about guide experience and medical training; types of medical kits and safety equipment carried by guides; contingency plans for emergencies; recommendations for medications and medical supplies to be carried by participants; and types of recommended insurance.

In a few cases (e.g., Mount Everest expeditions, polar cruises), a formal medical officer with a

comprehensive medical kit might accompany the participants. By contrast, for self-planned trips, travel health providers might need to offer more support with logistics, insurance, evacuation planning, and to augment a comprehensive medical kit with prescription medications.

Confirm that the experience, fitness, and skill level of the participant matches the trip type. Novices at diving, mountaineering, sailing, or skiing should participate in instructional trips. Encourage people with less experience or who are visiting a location for the first time to go on a guided trip. Because many people will consult a travel medicine professional only after they have selected and paid for their adventure, some might need a medical waiver or letter to change the trip to be more in line with their skill, experience, and fitness.

## Personal Health Requirements

Travelers might need medical clearance to participate in a guided trip. For travelers with chronic diseases, the primary care provider (PCP) should complete the medical clearance and provide prescriptions for regular medications, if possible (see Sec. 3, Ch. 3, Travelers with Chronic Illnesses). Travel health practitioners can complete pretravel medical clearance if it is a usual function of their practice, and the patient has no underlying chronic diseases or medications; even so, consider consulting with the traveler's PCP to help determine medical clearance.

Screen travelers for conditions that can be exacerbated by exertion or environmental hazards (e.g., high elevation, temperature extremes). Ask travelers whether they have a history of anaphylaxis-level allergies, asthma, cardiac disease, cerebrovascular disease (e.g., stroke, transient ischemic attack), chronic pain treated with opiates, deep vein thrombosis, diabetes, oxygen-dependent emphysema, joint replacement, pulmonary embolism, recent surgery, or sleep apnea. Any of these conditions could indicate a traveler is at risk for adverse outcomes under physiological stressful conditions. Travelers with a previous history of environmental illness (e.g., altitude illness, anaphylaxis, frostbite, heat exhaustion, hypothermia) could be at risk for recurrence.





Travelers with chronic or major medical issues should carry a medication list, printed copies of their most recent electrocardiogram, chest x-ray, and their medical history; or download electronic copies to their phone in PDF or JPG format. Caution travelers who rely on battery-operated devices (e.g., continuous positive airway pressure [CPAP] machine, insulin pump) about the possibility of device failure, and discuss the need for a backup plan or the possibility that they should avoid adventure travel altogether. Some people with chronic illness, especially those who are medically dependent on electronic devices, who have difficulty ambulating, and who are medically frail, likely are not good candidates for adventure travel.

Adequate hydration, nutrition, and sleep could be in short supply, especially with increased demands due to exertion, weather, and terrain. During the planning stages, travelers should pay attention to how they will obtain water, food, and rest on their journey.

## Travel Insurance

Insurance is widely variable and comes in many forms, and having insurance does not guarantee rescue (see Sec. 6, Ch. 1, Travel Insurance, Travel Health Insurance & Medical Evacuation Insurance). Travelers might need to pay in advance for rescue, evacuation, and repatriation, which can be expensive, especially for aeromedical transport from remote locations. Travelers should bring sufficient emergency cash and a credit card with high credit and cash advance limits.

Coverage can be contingent on preexisting conditions, deductibles, maximum expenditures, and medical control approval. Insurers also might not authorize aeromedical transport. Insurance companies might deny claims involving alcohol or drugs, chronic illness, mental health, pregnancy, and acts of war or civil unrest. Travelers should read policies carefully before purchasing and departing on their trip.

## DOMESTIC HEALTH INSURANCE

Domestic health insurance might or might not be effective outside a home country. Often, travelers need to pay up front for medical care and get

reimbursed from health insurance providers once they return home.

## TRAVEL INSURANCE

Travel insurance, which often includes medical, trip cancellation, evacuation, and repatriation benefits, might exclude coverage for wilderness rescue and adventure sports like diving, mountaineering, and skiing. An adventure sports rider is available with some travel insurance policies.

## WILDERNESS RESCUE INSURANCE

Usually purchased separately from travel insurance, wilderness rescue insurance policies are available through specialty clubs, outdoor and professional associations, and organizations (e.g., the American Alpine Club [<https://americanalpineclub.org>], Divers Alert Network [<https://dan.org>]).

## SHORT-TERM RESCUE INSURANCE

Short-term rescue insurance is available in some destination countries through local helicopter rescue companies, mountaineering clubs, and ski resorts. In Switzerland, for example, travelers can become a member of Rega ([www.rega.ch/en/](http://www.rega.ch/en/)), the aeromedical rescue service.

## COMPREHENSIVE EXPEDITION POLICIES

Comprehensive expedition policies can include travel, medical, rescue, repatriation, and security services.

## First Aid & Safety Training

If travelers have time, they should consider completing basic life support and first aid courses before departure. These can be particularly helpful for regular adventure travelers. Such courses can be found through local community colleges and fire departments, the American Heart Association (<https://cpr.heart.org/en>), and the American Red Cross ([www.redcross.org/take-a-class/cpr/cpr-training/cpr-classes](http://www.redcross.org/take-a-class/cpr/cpr-training/cpr-classes)).

## Emergency Resources

Travelers should always keep their credit cards, money, passport, and other documents on their person because they might need to seek medical care or evacuate urgently without their luggage.

## BOX 9-12 Adventure travel health & safety tips

### ALLERGIES & ANAPHYLAXIS

Bites, stings, food, and other allergens can cause anaphylaxis. Epinephrine and corticosteroids can be lifesaving if administered immediately. See Sec. 3, Ch. 4, Highly Allergic Travelers.

### ALTITUDE ILLNESS

Travelers to high elevations might require acetazolamide, dexamethasone, or other medications to prevent or treat altitude illness. Mental status changes and ataxia are warning signs for high-altitude cerebral edema. Breathlessness at rest is the sign of life-threatening high-altitude pulmonary edema. See Sec. 4, Ch. 5, High Elevation Travel & Altitude Illness.

### BASIC WOUND CARE

Travelers should be aware of basic wound care and self-treatment with antibiotics. Redness, swelling, pus, and warmth are signs of infection that might require medical attention.

### FROSTBITE

Frostbite is treated with rapid rewarming with non-scalding warm water. Warn travelers not to allow a thawed extremity to refreeze (see Sec. 4, Ch. 2, Extremes of Temperature).

### HEAT STROKE

Heat stroke marked by a temperature of 40°C and mental status changes is a medical emergency (see Sec. 4, Ch. 2, Extremes of Temperature).

### HYPOTHERMIA

For hypothermia, cessation of shivering and mental status changes are dangerous signs (see Sec. 4, Ch. 2, Extremes of Temperature).

### RABIES

Rabies is prevalent around the world, and preexposure (pretravel) vaccination should be considered because rabies immune globulin and vaccine might be difficult to find in certain countries (see Sec. 5, Part 2, Ch. 18, Rabies).

### VENOMOUS CREATURES

Jellyfish, scorpions, snakes, spiders, and ticks can deliver toxic venom, inoculate microbes, and cause anaphylaxis. Region-specific antivenoms can be found for certain venomous species around the world (see Sec. 4, Ch. 7, Zoonotic Exposures: Bites, Stings, Scratches & Other Hazards).

Travelers also can store backup copies as a PDF or JPG on a mobile phone.

Before leaving on their adventure, travelers should know embassy contacts, emergency escape routes, local medical facilities, and local rescue resources. Travel medicine practitioners willing to accept emails, phone calls, and text messages from travelers abroad should make sure that travelers understand this is not a substitute for local emergency care (see Sec. 2, Ch. 16, Telemedicine). In a pretravel medicine encounter, physicians might have only a few minutes to educate travelers. Depending on the type, duration, and location of trip, a few key adventure travel health and safety tips (see Box 9-12) might be worth discussing.

## WILDERNESS SUPPLIES

Adventure travelers should pack and carry the following clothing, supplies, and gear.

### Clothing

Remind travelers that clothing helps prevent heat and cold illness as well as bites and stings from

insects and other arthropods. Cold weather clothing should be made of polyester, nylon, Merino wool, or, in some circumstances, down. Layering typically consists of a base layer, insulating layers of heavy-pile polyester or nylon-encased polyester (down suffices if traveling to a location that is dry and cold, but does not function well when it gets wet), and a windproof, waterproof outer layer of tightly woven nylon with a durable water-repellent coating. Gloves, hat, neck warmer, warm socks, and goggles are vital to cover all exposed skin.

For hot weather, sun- and insect-protective clothing is important, including loose-fitting, lightweight clothing made from nylon, polyester, or a cotton blend. Long-sleeve shirts and long pants offer the most protection. A wide-brim sun hat, a sun shirt with a hood, and a bandana or buff protect the head and neck; sunglasses protect eyes. For more details on protection from sun exposure and extreme temperatures during travel, see the respective chapters in Section 4. Clothing should be sprayed with permethrin to



ward off insects and arthropods (see Sec. 4, Ch. 6, Mosquitoes, Ticks & Other Arthropods).

Footwear should be activity-specific boots or shoes, equally important in a marine or mountain environment. Because even a minor foot injury can be debilitating, advise travelers to never go without footwear.

## Communication & Route-Finding Equipment

Travelers should carry a mobile phone enabled with a global positioning system (GPS). Phones can be used to store electronic versions of documents (e.g., embassy and hospital contact information, insurance policies, medical data, passport copies, plane tickets) in email, JPG, or PDF format. Because not all North American mobile phones and service plans are compatible with international networks, travelers should check with their local (i.e., domestic) carrier before departing.

Alternatively, an unlocked (not restricted to any carrier) global-compatible mobile phone can be used with a local SIM card in the country of travel. Inexpensive phones and SIM cards are usually available at stores in airports and major cities. In some countries, registration to obtain a local SIM card requires fingerprinting and a passport.

An emergency satellite communication device is an excellent tool to carry. This device can synch with a mobile phone to send routine and emergency messages, usually via text. Where cellular phone service is not available, travelers might consider an unlocked (no frequency restrictions) VHF/UHF radio or a satellite phone. Several countries worldwide require users of handheld radios and satellite phones to have permits, however; advise travelers that restrictions might exist at their destination, and to learn what they are before departing.

Remind travelers that electronics are not fool-proof; often they are limited by battery power, deep canyons, dense cloud cover, government restrictions, and physical damage caused by extreme temperatures, impact, or water exposure. A backup external battery and external power source (e.g., a solar or dynamo charger) are useful.

For extreme terrain and remote locations, adventurers should carry a GPS app installed on

their mobile phone. Alternatively, they can carry a separate GPS device. Suggest that travelers upload maps to their phones or GPS devices prior to departure. They also might choose to learn how to use and to bring an altimeter, compass, and local topographic map (the latter might need to be acquired in-country).

## Emergency Kits

Adventure travelers often require a comprehensive, yet compact, personal emergency kit for medical care and survival and equipment repair. Beyond a basic travel health kit (see Sec. 2, Ch. 10, Travel Health Kits), adventure travelers should consider packing additional items due to the remote nature of their travel. Standard kits might need to be augmented for specific types of travel (e.g., high elevation, jungle, open ocean, polar, undersea).

If travelers are on guided trips, they might only need a small personal medical kit. Before they depart, travelers should determine whether guides provide group emergency equipment (e.g., comprehensive medical kit, automatic external defibrillator, portable hyperbaric chamber and oxygen, portable stretcher). Be cautious if asked to prescribe medications for guides to stock in the expedition medical kit intended for clients. Third-party use of prescription medication is unlawful in most jurisdictions and best left for the guide company medical director. If prescribing to a guide as a patient, clarify that the medication is for the guide's personal use.

## MEDICATIONS

Provide prescriptions and guidance for self-treatment for febrile illness, gastroenteritis (travelers' diarrhea), respiratory illness, and wound infections. In addition to routine travel medications (e.g., analgesics, antiemetics, motion sickness medication), consider prescribing ophthalmologic antibiotics and anesthetic, nonsedating antihistamines, and altitude illness medicines. Instruct travelers on self-treatment of anaphylaxis, because this can be lifesaving; epinephrine auto injectors are common, but a less-expensive alternative is a vial of epinephrine and a syringe. Diabetics should carry glucagon and glucose gel for hypoglycemia.

## BOX 9-13 Additional safety equipment: a checklist for adventure travelers

- |  |   |
|--|---|
| <input type="checkbox"/> Antibacterial wipes                                   | <input type="checkbox"/> Oral rehydration salts                         |
| <input type="checkbox"/> Chemical heat packs                                   | <input type="checkbox"/> Perlon cord                                    |
| <input type="checkbox"/> Duct tape   | <input type="checkbox"/> Polyurethane straps and plastic cable ties     |
| <input type="checkbox"/> Earplugs and eyeshade                                 | <input type="checkbox"/> Rain poncho and umbrella                       |
| <input type="checkbox"/> Emergency sleeping sack or tarp                       | <input type="checkbox"/> Safety pins                                    |
| <input type="checkbox"/> Eyeglasses (spare pair)                               | <input type="checkbox"/> Satellite communication device                 |
| <input type="checkbox"/> Hand sanitizer  | <input type="checkbox"/> Spare phone power pack or solar/dynamo charger |
| <input type="checkbox"/> Headlight with extra batteries                        | <input type="checkbox"/> Sun hat, bandana, and sunglasses               |
| <input type="checkbox"/> Insect repellent                                      | <input type="checkbox"/> Sunscreen and lip balm                         |
| <input type="checkbox"/> Laundry detergent                                     | <input type="checkbox"/> Water purification tablets                     |
| <input type="checkbox"/> Mobile phone with global positioning system (GPS) app | <input type="checkbox"/> Whistle  |
| <input type="checkbox"/> Multi-tool  | <input type="checkbox"/> Toilet paper                                   |

Consider opioid and prescription nonsteroidal anti-inflammatory pain medication, bearing in mind that in some countries, travelers might be restricted from bringing in opioid drugs, even for their own use. A patient on chronic opioids might consider bringing naloxone for emergency reversal of opioid overdose.

### SAFETY SUPPLIES

In addition to items typically included in a general travel health kit, adventure travelers should consider packing safety equipment that can help in an emergency (see Box 9-13).

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## SEX & TRAVEL

Melanie Taylor, Ina Park

A natural human desire for novel experiences, coupled with the often-experienced loss of inhibition associated with being away from home, can lead some travelers to take greater than usual sexual behavioral risks (e.g., engaging in sex with new, unknown partners; having sex with multiple partners; connecting with sex networks) while

abroad. Any of these behaviors can increase the traveler's risk for exposure to sexually transmitted infections (STIs), including HIV. Use of alcohol or drugs (which further decrease inhibition), or geosocial networking applications ("apps" which increase the efficiency of meeting sexual partners while abroad) can amplify a traveler's



chances of having an at-risk exposure, in some cases substantially.

Clinicians have an opportunity to help patients reduce their risk of exposure to STIs through pre-travel behavioral-prevention and risk-reduction counseling and medical care. Elements of the pre-travel preparation include STI prevention guidance (e.g., advocating for the use of condoms or other barrier methods); STI screening, treatment, and vaccines; and a discussion about HIV pre- and postexposure prophylaxis. Consider providing preexposure prophylaxis (PrEP) to prevent HIV infection in travelers planning to have condomless sex. The pretravel consultation also gives clinicians a chance to review safety recommendations to prevent sexual assault during travel.

## SEX WHILE TRAVELING

Sex while traveling encompasses the categories of casual consensual sex, sex tourism, sexual violence or assault, connection to sex trafficking, and sexual exploitation of children.

### Casual Consensual Sex

Casual consensual sex during travel describes informal, non-transactional sexual encounters with other travelers or locals. Longer duration of travel, traveling alone or with friends, alcohol or drug use, younger age, and being single are factors associated with engaging in casual sex while traveling internationally. Other associations with casual sex are listed in Box 9-14. Two meta-analyses estimated that 20%–34% of male international travelers engage in casual sex abroad, and that 43%–49% of all travelers participating in casual sex abroad have condomless sex.

## MEN WHO HAVE SEX WITH MEN

For men who have sex with men (MSM), conclusions from the literature regarding their sexual behavior when traveling are conflicting. Some studies examining MSM sexual behavior when traveling have concluded that this population is more likely to engage in condomless anal intercourse with partners of unknown HIV status; to have concurrent or multiple sex partners; or to have sex in conjunction with substance use while traveling. These can be particularly true if the reason for travel is to attend group sex events or gatherings (e.g., cruises, circuit parties). Other reports, however, indicate that MSM might adapt their behaviors when traveling to destinations perceived to have a higher risk for HIV. One study found that MSM who travel internationally were less likely to have condomless anal intercourse with partners abroad compared to partners encountered at home or during domestic travel.

### Sex Tourism

Travel for the specific purpose of procuring sex is considered “sex tourism,” and sex tourism destinations frequently are countries where commercial sex is legal. In some countries, sex tourism supports sex trafficking, among the largest and most lucrative criminal industries in the world. Sex tourists have traditionally been men from high-income countries who travel to low- and middle-income countries to pay for sex with local women, including commercial sex workers. Sex tourism among American and European women also has been described, particularly to the Caribbean.

Having condomless sex with commercial sex workers is associated with an increased risk for

### BOX 9-14 Factors associated with higher frequency of casual or unprotected sex abroad

Casual sex at home and during a previous travel experience  
Expectation of casual sex while abroad  
History of previous sexually transmitted infection  
Illicit drug use, alcohol abuse, tobacco use  
Long-term travel (expatriates, military, Peace Corps volunteers)

Male  
Single  
Traveling without a partner (either alone or with friends)  
Younger age  
≥2 sex partners in the last 2 years



STIs. Multidrug-resistant gonorrhea infections have been linked to encounters with sex workers. High rates of HIV are also frequently found among sex workers, with a systematic review describing a global prevalence of 11.8%. Among sex workers in Thailand, however, HIV rates of up to 44% have been described; in Kenya, the rate among sex workers has been reported to be even higher (up to 88%).

## Sexual Violence & Assault

People of any age, gender, or sexual orientation can be victims of sexual violence during travel and should be aware of this risk. The risk for sexual assault is greater among young women traveling alone and in regions of high sexual violence prevalence (e.g., central and southern sub-Saharan Africa, Andean Latin America, Australasia). In addition, some studies have identified that young gay and bisexual males (MSM) traveling internationally might be victims of sexual violence more frequently than females or heterosexual males. Sexual violence can occur more often in association with international recreational travel, but it is also reported in travelers participating in humanitarian aid work. Alcohol and drug use have been shown to increase vulnerability for sexual assault. Unfamiliar cultural norms, environments, language barriers, and safety concerns might also increase the risk.

## POST-SEXUAL ASSAULT MEDICAL CARE

Victims of sexual violence (particularly rape) should seek immediate medical attention. Health care sought after 72 hours could negate the benefits of postexposure prophylaxis for HIV and STIs, lower the effectiveness of emergency contraception, and reduce the value of any collected forensic evidence. Seeking medical care following a sexual assault can, however, be difficult in places where safety is a concern, where health care is not easily accessed, and where language and other barriers might not facilitate appropriate evaluation.

In addition to HIV and other STI postexposure prophylaxis, emergency contraception, and the forensic examination, medical attention after sexual assault should include treatment of injuries and provision of mental health and other

supportive care. Adolescent-adapted services should be available and sought to address the related but different needs of youth who have been victims of sexual violence.

## Sex Trafficking & Sexual Exploitation of Children

Although commercial sex work is legal in some parts of the world, sex trafficking, sex with a minor, and child pornography are always criminal activities according to US law, and travelers can be prosecuted in the United States even if they participated in such activities abroad. The Trafficking Victims Protection Act ([www.state.gov/international-and-domestic-law](http://www.state.gov/international-and-domestic-law)) makes it illegal to recruit, entice, or obtain a person of any age to engage in commercial sex acts or to benefit from such activities.

## SEX WITH MINORS

Federal law bars US residents traveling abroad from having sex with minors; this applies to all travelers, both adult and youth. Travel health providers should inform student travelers and other young people going abroad that according to US law, it is illegal for a US resident to have sex with a minor in another country. The legal age of consent varies around the world, from 11–21 years old. Some countries have no legal age of consent, with local laws forbidding all sexual relations outside of marriage.

## CHILD PORNOGRAPHY

Regardless of the local age of consent, participation in child pornography anywhere in the world is illegal in the United States. US Code Title 18, Chapter 110, ([www.law.cornell.edu/uscode/text/18/part-I/chapter-110](http://www.law.cornell.edu/uscode/text/18/part-I/chapter-110)) prohibits sex with minors, as well as the purchase, procurement, holding, or storage of material depicting such acts. These crimes are subject to prosecution with penalties of up to 30 years in prison. Victims of child pornography suffer multiple forms of abuse (emotional, physical, psychological, as well as sexual), poverty and homelessness, and health problems, including physical injury, STIs, other infections and illnesses, drug and alcohol addiction, and malnourishment.



## SEXUAL EXPLOITATION OF CHILDREN

Sexual exploitation of children in travel and tourism affects all countries of the world regardless of income level. Offenders can include expatriates, humanitarian aid workers, international business travelers, military personnel, people attending large-scale sporting and cultural events, teachers, travelers and tourists, and volunteers. Financial vulnerabilities of families and communities resulting from the millions of travel and tourism jobs lost due to the coronavirus disease 2019 pandemic, the availability of cheap and accessible travel, and expanding access to information and communication technologies are expected to increase opportunities for child sexual exploitation.

### COMBATting SEXUAL EXPLOITATION OF CHILDREN

To combat sexual exploitation of children, some international hotels and other tourism services have voluntarily adopted a code of conduct that includes training their employees to recognize and report suspicious activities. Tourist establishments supporting this initiative to protect children from sex tourism are listed online ([www.thecode.org](http://www.thecode.org)). Providers and travelers who suspect child sexual exploitation occurring abroad can report tips anonymously by calling the Homeland Security Investigations Tip Line (toll-free at 866-347-2423), or by submitting information online to US Immigration and Customs Enforcement ([www.ice.gov/tips](http://www.ice.gov/tips)) or the International Centre for Missing & Exploited Children ([www.icmec.org](http://www.icmec.org)).

In the United States, the National Center for Missing & Exploited Children's Cyber Tipline collects reports of child prostitution and other crimes against children (toll-free at 800-843-5678, <https://report.cybertip.org>).

### PROTECT ACT

Since 2003, when Congress passed the federal PROTECT Act, US Immigrations and Customs Enforcement has arrested >11,000 offenders for child sex tourism and exploitation, including 1,100 outside of the United States. The PROTECT Act strengthens the US government's ability to prosecute and punish crimes related to sex tourism,

including incarceration of ≤30 years for acts committed at home or abroad.

Cooperation of the host country is required to open an investigation of criminal activity, resulting in a much lower than hoped for conviction rate. In some places, the judicial system might be prone to bribery and corruption, or the government is otherwise willing to expand tourism and the money it brings at the expense of children being trafficked for sex. The US Department of State has published a list of 20 ways to fight human trafficking, including recommendations for youth and their parents, attorneys, health care providers, journalists, and other stakeholders ([www.state.gov/j/tip/id/help](http://www.state.gov/j/tip/id/help)).

## SEXUALLY TRANSMITTED INFECTIONS

See Sec. 11, Ch. 10, Sexually Transmitted Infections, for details regarding the management of STIs in returned travelers.

### Epidemiology

In 2019, the World Health Organization estimated that 376 million new infections with curable sexually transmitted pathogens (chlamydia, gonorrhea, trichomoniasis, and syphilis) occur annually. Globally, >500 million adults are estimated to be infected with a genital herpes virus; ≈40 million people are infected with HIV; and >300 million with human papillomavirus infections, the cause of cervical cancer. Over 30 infections are sexually transmitted, several of which are neither curable nor vaccine preventable.

The distribution of STI prevalence and STI resistance to available treatment varies, and some countries and regions have very high rates of STIs. International travelers having sex with new partners while abroad are exposed to different "sexual networks" than at home and can serve as a conduit for importing novel or antimicrobial-resistant STIs into parts of the world where they are unknown or rare. For example, gonorrhea (among the more common STIs globally with ≈78 million new cases in 2016) has become extensively drug resistant in some parts of the world. Multidrug-resistant gonorrhea infections have been associated with unprotected sex and commercial sex during travel. Patients presenting with antimicrobial-resistant gonococcal infections

should prompt providers to inquire about their travel history and the travel history of their sex partners.

## Prevention

STI incidence is increased  $\leq 3$ -fold in people who experience casual sex while traveling internationally, a consequence of new sexual partnerships and unprotected intercourse. Condoms prevent both STIs and unwanted pregnancy. Preventive vaccines (which can be considered as part of pretravel care) are available for some infections transmitted through intercourse (e.g., hepatitis A, hepatitis B, human papillomavirus). HIV PrEP might be appropriate for travelers planning to engage in condomless sex during travel. Travelers should consider packing condoms from their home country to avoid the need to search for them in the countries visited during travel. Women carrying condoms in luggage might need

to conceal these to avoid questions related to sexual activity or assumed behaviors.

## MONKEYPOX

In May 2022, a multinational outbreak of monkeypox began; 3 months later (by the end of August) it involved people from >90 countries ([www.cdc.gov/poxvirus/monkeypox/response/2022/world-map.html](http://www.cdc.gov/poxvirus/monkeypox/response/2022/world-map.html)). During the outbreak, the causative agent, monkeypox virus (see Sec. 5, Part 2, Ch. 22, Smallpox & Other Orthopoxvirus-Associated Infections), spread person-to-person primarily through close (both sexual and non-sexual) skin-to-skin contact. Most cases occurred among gay, bisexual, and other men who have sex with men; international travel played a role in introducing the virus to new countries. Remind all travelers that sex with new partners can increase their risk of contracting infections, including monkeypox.

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# 10

# Popular Itineraries

## THE RATIONALE FOR POPULAR ITINERARIES

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In this section of the CDC Yellow Book, experts who have lived in or frequently visited destinations share their insider's knowledge of those places. Each chapter is intended to help travel health providers feel more comfortable giving

advice about destinations they might never have visited. Editorial decisions about which popular itineraries to include are guided by a variety of factors, including volume of US travel and uniqueness of health risks.



# PART 1: AFRICA & THE MIDDLE EAST

## AFRICAN SAFARIS

Kate Varela, Juliet Kasule, Joseph Ojwang, Aimee Geissler, Karl Neumann

### DESTINATION OVERVIEW

Arguably the ultimate in adventure travel, an African safari is the experience of a lifetime. Safari-goers have options to view wildlife from different vantages: on land (traditional savannah guided car safaris, open trucks, air-conditioned vans, personal vehicles), on the water (in a dug-out canoe), or from the air (private aircraft, hot air balloon). Hiking with trained, licensed guides in well-scouted settings offers another opportunity to see wildlife up close; treks to view chimpanzees or gorillas, for example, are highly popular.

With >150 game parks and reserves across the continent, individual travelers, families, backpackers, and people with similar interests (e.g., serious photographers) have a range of choices and budget options. Some parks are remote and rustic, with long drives to see the animals but with fewer tourists. Other parks are easily accessible with self-drive options. Many safaris accept young children and adolescent participants; gorilla trekking and other more strenuous activities require participants to be ≥15 years of age.

Map 10-01 and Map 10-02 show several major African game parks. In East Africa, the Maasai Mara National Reserve in Kenya is the northern extension of Tanzania's Serengeti National Park game reserve. Together these 2 parks are home to the complete collection of the so-called big 5—Cape buffalo, elephants, leopards, lions, and rhinoceros—the large wild animals for which

Africa is most famous. Other East African game parks that offer exceptional wildlife viewing include Tsavo National Park (Kenya); Akagera National Park (Rwanda); Ngorongoro Crater (Tanzania); and Ngamba Island Chimpanzee Sanctuary, Murchison Falls National Park, Queen Elizabeth National Park, and Ziwa Rhino Sanctuary (Uganda). Travelers can trek to see gorillas at the Virunga National Park (Democratic Republic of the Congo), Volcanoes National Park (Rwanda), and Bwindi Impenetrable National Park (Uganda); “impenetrable” refers to the challenging hiking required in this park.

Game park destinations in Southern Africa include Moremi Game Reserve, Chobe National Park, and Kalahari Desert (Botswana); Etosha National Park (Namibia); Kruger National Park (South Africa); Lower Zambezi National Park and South Luangwa National Park (Zambia); and the Hwange National Park (Zimbabwe). Pendjari National Park in Benin, home to West African lions and elephants, is a major part of the largest intact ecosystem in West Africa, the transnational W-Arly-Pendjari (WAP) complex, which spans Benin, Burkina Faso, and Niger. Mole National Park (Ghana) boasts >93 mammal species, including elephants and hippos.

Although the centerpiece of safari-going remains viewing majestic animals in their natural habitat, many tour operators now also offer programs on local culture and history, ecosystems, and geology. Conservation-based tours promoting responsible tourism give travelers an



MAP 10-01 African game parks & reserves (North)

opportunity to help safeguard wildlife, protect vital habitat, and benefit local people.

## INFECTIOUS DISEASE RISKS

Health, safety, and comfort issues that safari-goers are likely to encounter are mostly predictable and largely avoidable. A pretravel consultation with a travel health care provider is essential. Multiple vaccinations might be required for healthy safari travel. Provide advice specific to each traveler's itinerary, country, and game park. Because vaccines take time to become effective, advise travelers to seek vaccination as early as possible prior to planned departure. For people trekking to see gorillas, certain vaccines are recommended to protect both travelers and animals, including coronavirus disease 2019 (COVID-19), diphtheria-tetanus-pertussis, hepatitis A and hepatitis B, influenza, measles-mumps-rubella, polio, and yellow fever.

## Enteric Infections & Diseases

### HEPATITIS A

Hepatitis A virus is transmitted through ingestion of contaminated food or water or through direct contact with an infectious person. Hepatitis A is among the most common vaccine-preventable infections acquired during travel. Risk is greatest for people who live or visit rural areas, trek in backcountry areas, or frequently eat or drink in settings of poor sanitation. Vaccination is recommended for travelers to sub-Saharan Africa, including safari-goers (see Sec. 5, Part 2, Ch. 7, Hepatitis A).

### TRAVELERS' DIARRHEA

Travelers' diarrhea (TD) is the most predictable travel-related illness and is common on safaris. Prepare travelers by explaining the risks for TD and how best to prevent it through appropriate hand hygiene and careful selection of





MAP 10-02 African game parks & reserves (South)

foods and beverages (see Sec. 2, Ch. 6, Travelers' Diarrhea). Infectious causes of TD include bacteria (e.g., *Campylobacter jejuni*, *Escherichia coli*, *Salmonella* spp., *Shigella* spp.), viruses (e.g., norovirus, rotavirus), and protozoa (e.g., *Cryptosporidium*, *Giardia*).

Most TD cases are mild and self-limiting. Advise travelers to carry antimotility medicine for symptomatic relief of mild TD. Consider prescribing antibiotic therapy to treat moderate to severe TD and providing travelers with clear written guidance about TD prevention and step-by-step instructions about how and when to use medications. Travelers should carry any medications with them on safari, because access to authentic drugs is not guaranteed in remote locations (see Sec. 6, Ch. 3, . . . *perspectives*: Avoiding Poorly Regulated Medicines & Medical Products During Travel). Travelers should consult a physician for moderate, severe, or persistent TD.

No vaccines are available for most pathogens that cause TD. Cholera vaccine is not needed for safari-goers unless they are planning a side trip to work in a refugee camp or do humanitarian aid work in an affected country. Advise travelers to carry alcohol-based hand sanitizer with  $\geq 60\%$  alcohol for use when water and soap are scarce or unsafe, or conditions are generally unhygienic. Travelers should avoid drinking tap water while on safari and only consume adequately disinfected (e.g., commercially bottled) water from an unopened, factory-sealed container (see Sec. 2, Ch. 8, Food & Water Precautions).

### TYPHOID FEVER

Typhoid fever is a bacterial disease caused by *Salmonella typhi* (see Sec. 5, Part 1, Ch. 24, Typhoid & Paratyphoid Fever). Typhoid fever vaccine generally is recommended for safari-goers. Because vaccination does not confer 100% protection, however, even vaccinated travelers should avoid

consumption of potentially contaminated food and water.

## Respiratory Infections & Diseases

Respiratory illnesses (e.g., COVID-19, influenza, tuberculosis [TB]) can spread between people and from people to the wildlife they encounter.

### CORONAVIRUS DISEASE 2019

In zoos and animal sanctuaries, big cats (cougars, lions, pumas, tigers, snow leopards) and mountain gorillas have tested positive for severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2), the virus that causes COVID-19. Special operating procedures are in now place to protect wildlife and travelers; these include mandatory COVID-19 testing, limited group capacity, and required mask use to enter Volcanoes National Park and other gorilla parks; several game parks, including Kruger National Park in South Africa, also require entrants to provide a negative COVID-19 test result before permitting entry. Travelers should check with tour operators and park websites ahead of travel for up-to-date requirements, and follow park requirements to help keep both wildlife and people safe and healthy.

Advise travelers to closely adhere to all international travel guidance for COVID-19 testing, vaccination, and quarantine, including countries transited through and upon return to the United States ([www.cdc.gov/coronavirus/2019-ncov/travelers/international-travel/index.html](http://www.cdc.gov/coronavirus/2019-ncov/travelers/international-travel/index.html)). For current information on COVID-19 at their destination(s), travelers to Africa should consult the US Embassy website (<https://travel.state.gov/content/travel/en/traveladvisories/COVID-19-Country-Specific-Information.html>). For the US government's COVID-19 international travel requirements and recommendations, see [www.cdc.gov/coronavirus/2019-ncov/travelers/international-travel/index.html](http://www.cdc.gov/coronavirus/2019-ncov/travelers/international-travel/index.html). All travelers going to Africa should be up to date with their COVID-19 vaccines ([www.cdc.gov/coronavirus/2019-ncov/vaccines/stay-up-to-date.html](http://www.cdc.gov/coronavirus/2019-ncov/vaccines/stay-up-to-date.html)).

### INFLUENZA & TUBERCULOSIS

While on safari, when trekking, or when visiting local communities, travelers can potentially encounter livestock species susceptible to

influenza (e.g., chickens, pigs, waterfowl) and TB (e.g., cows).

Chimpanzees, gorillas, and other wildlife also are susceptible to influenza virus and *Mycobacterium tuberculosis* infection. Responsible tourism requires ill people to refrain from wildlife trekking or other activities that involve close contact with wildlife.

## Soil- & Waterborne Infections

### SCHISTOSOMIASIS

Freshwater lakes, ponds, and rivers all pose a risk for exposure to *Schistosoma* species, a parasite found in freshwater snails (see Sec. 5, Part 3, Ch. 20, Schistosomiasis). Travelers should consider all freshwater sources to be contaminated and avoid bathing, swimming, wading, or other freshwater contact in disease-endemic countries. River trips (e.g., Nile River white-water rafting) present a risk for schistosomiasis (bilharzia). Swimming in the ocean or well-chlorinated pools is not a risk for schistosomiasis.

## Vectorborne Diseases

Travelers should take steps to avoid arthropod bites to reduce their risk for vectorborne infections (for detailed recommendations, see Sec. 4, Ch. 6, Mosquitoes, Ticks & Other Arthropods).

### CHIKUNGUNYA, DENGUE, ZIKA

Chikungunya, dengue, and Zika are arboviruses transmitted by *Aedes* species mosquitoes in game parks throughout Africa (for details on each of these diseases, see the relevant chapters in Section 5). *Aedes* mosquitoes are aggressive daytime biters, but also bite at night.

### MALARIA

Malaria is endemic in sub-Saharan Africa, and transmission occurs in most game parks. Most infections are caused by *Plasmodium falciparum*. All *P. falciparum* in sub-Saharan Africa is considered chloroquine-resistant. Safari activities often include sleeping in tents and observing animals at dusk or after dark, sometimes near water holes, all of which increase the risk for exposure to malaria-carrying *Anopheles* mosquitoes. Appropriate malaria chemoprophylaxis and personal protection—wearing long-sleeved shirts and pants, using insect repellents, and





sleeping under permethrin-impregnated mosquito netting—are essential (see Sec. 2, Ch. 5, Yellow Fever Vaccine & Malaria Prevention Information, by Country, and Sec. 5, Part 3, Ch. 16, Malaria).

### RICKETTSIAL DISEASES

African tick-bite fever (ATBF) is endemic to much of sub-Saharan Africa; among returning travelers, it is the most commonly diagnosed rickettsial disease (see Sec. 5, Part 1, Ch. 18, Rickettsial Diseases). Travel-associated cases of ATBF often occur in clusters of people exposed while participating in common activities (e.g., bush hiking, game hunting, safari tours). Travelers can protect themselves from infection by taking precautions to prevent tick bites.

### TRYPANOSOMIASIS

Day-biting tsetse flies (*Glossina* species) transmit African trypanosomiasis (sleeping sickness), a disease only rarely seen in travelers (see Sec. 5, Part 3, Ch. 24, African Trypanosomiasis). Several reports document trypanosomiasis in travelers returning from visits to national parks or game reserves, including Kenya's Maasai Mara National Reserve. Advise travelers that neutral-colored clothing seems to deter the flies, and that permethrin-impregnated clothing and insect repellent can reduce fly bites.

### WEST NILE

West Nile virus is an arbovirus transmitted by *Culex* species mosquitoes that are typically more active at dusk and dawn.

### YELLOW FEVER

Travelers going on an African safari should consult a travel medicine professional for the very latest information regarding yellow fever at their destination. Currently, the World Health Organization and the Centers for Disease Control and Prevention recommend yellow fever vaccination for much of sub-Saharan Africa (see Sec. 2, Ch. 5, Yellow Fever Vaccine & Malaria Prevention Information, by Country, and Sec. 5, Part 2, Ch. 26, Yellow Fever).

Some countries require proof of yellow fever vaccination in the form of a valid International

Certificate of Vaccination or Prophylaxis (ICVP), also known as the yellow card, as a condition of entry. Moreover, some safaris cross international borders to include  $\geq 1$  country. Assist travelers by checking the requirements for each country on their itinerary, including countries they only transit through on the way to their destination.

### Viral Hemorrhagic Fevers

Crimean-Congo hemorrhagic fever (CCHF), Ebola virus disease (EVD), Lassa fever, Marburg virus disease (MVD), and Rift Valley fever (RVF) are viral hemorrhagic fevers (VHFs) found in and around some game parks in sub-Saharan Africa. Although travelers are rarely affected, zoonotic exposure to VHFs can occur through direct contact with wildlife (e.g., bats, nonhuman primates, rodents), insect (e.g., mosquito) or tick bites, and contact with blood or body fluid of livestock (see Sec. 5, Part 2, Ch. 25, Viral Hemorrhagic Fevers).

Travelers who touch or come into proximity of bats (e.g., spelunking, visiting bat caves) are at greatest risk for Ebola virus or Marburg virus exposure. Four confirmed cases of MVD occurred in travelers visiting Kitum Cave in Kenya and Python Cave in Maramagambo Forest, Uganda. Caution travelers against visiting locations where VHF outbreaks are occurring, to avoid contact with bats and rodents, and to avoid blood or body fluids of livestock or animal carcasses.

## ENVIRONMENTAL HAZARDS & RISKS

### Animal Bites & Wildlife-Related Injuries

Wild animals are unpredictable. Travelers should follow verbal and written instructions provided by safari operators and guides and should take extra precautions if camping or traveling without a guide in a national park. Wildlife-related injuries usually occur when travelers disregard rules (e.g., when they approach animals too closely to feed or photograph them). People should never try to feed, handle, or pet unfamiliar animals, whether domestic or wild. If bitten or scratched by a monkey, travelers should be evaluated for B virus postexposure prophylaxis (see Sec. 5, Part 2, Ch. 1, B Virus).

Rabies exists throughout Africa; dogs and bats are the primary animal reservoirs (see Sec. 5, Part 2, Ch. 18, Rabies). The estimated rate of rabies exposures in travelers ranges from 16–200 per 100,000 travelers globally. Warn travelers not to enter caves where bats roost and shelter. Advise travelers to consult a physician for rabies post-exposure prophylaxis in case of animal bites or scratches or suspected bat exposures (e.g., sleeping in a cabin or tent where bats are found).

Consider preexposure prophylaxis for people whose planned activities will increase their chances of direct animal encounters (e.g., adventure travelers, animal sanctuary visitors, campers, cave explorers [spelunkers], participants in veterinary care or wildlife management programs). Additional considerations for preexposure prophylaxis might include whether rabies immunoglobulin (RIG) and rabies vaccination are available in the visited country in case of exposure (see [www.cdc.gov/rabies/resources/countries-risk.html](http://www.cdc.gov/rabies/resources/countries-risk.html)).

## Climate & Sun Exposure

Some parks are located at higher elevations and closer to the equator, making proper sun precautions imperative for avoiding sunburn, heat exhaustion, heat stroke, and dehydration. Advise travelers to seek shade, when possible, to avoid the sun during midday hours, and to carry water. In addition, advise travelers to wear sunglasses, protective clothing, and hats, and to use a broad-spectrum (protects against both ultraviolet A and ultraviolet B) sunscreen, SPF ≥15. Recommend travelers bring sunscreen and sunburn remedies with them, because selection can be limited and expensive once in country (see Sec. 4, Ch. 1, Sun Exposure).

## Natural Disasters

Natural disasters (e.g., earthquakes, flooding, landslides, volcanic eruptions) have all occurred and affected international travelers in recent years. During the rainy season, floods and landslides can be more common. Safari-goers should expect sudden road closures, plan alternative routes, and take precautions during storms. Dust storms might occur during the dry season. Poor air quality can exacerbate asthma or other lung

diseases. Encourage all travelers to enroll in the US Department of State's Smart Traveler Enrollment Program (<https://step.state.gov/step>) to receive up-to-date information in the event of a disaster.

## SAFETY & SECURITY

### Crime

Within the game parks, crime is unusual; robberies and car-jackings are more common in urban areas (see Sec. 4, Ch. 11, Safety & Security Overseas). Travelers should check with the US Department of State's Bureau of Consular Affairs (<http://travel.state.gov/travelsafely>) ahead of travel to learn more about safety and security risks before traveling.

### Traffic-Related Injuries

In sub-Saharan African countries, the rates of fatal motor vehicle crashes are among the highest in the world. Travelers should fasten seat belts when riding in motor vehicles, and wear a helmet when riding bicycles or motorbikes (see Sec. 8, Ch. 5, Road & Traffic Safety). Within game parks, serious motor vehicle crashes are rare because poor road conditions generally discourage speeding. Travel in rural areas between parks is high risk, however, especially after dark. If possible, travelers should avoid nighttime driving in sub-Saharan Africa, and pedestrians should take extra care to watch for speeding vehicles. Travelers should avoid boarding overcrowded buses, and avoid driving or riding on motorcycles and motorbikes.

## AVAILABILITY & QUALITY OF MEDICAL CARE

Travelers should work with their primary care provider to ensure any underlying illnesses are managed before travel. Before leaving the United States, each traveler also should be certain they have international health insurance coverage; and because surgical support or other advanced health care might not be available in the destination country, encourage travelers to purchase an additional medical evacuation insurance policy (see Sec. 6, Ch. 1, Travel Insurance, Travel Health Insurance & Medical Evacuation Insurance, and Sec. 6, Ch. 2, Obtaining Health Care Abroad).





Recommend travelers carry a personal medical kit with sufficient medication to treat allergies, chronic conditions, routine health needs, and emergencies (see Sec. 2, Ch. 10, Travel Health Kits). Warn travelers with food allergies that food labels might not reliably indicate potential allergens, and that lack of emergency services and language barriers can compound the risk for any severe allergic reaction that requires emergency medical care (see Sec. 3, Ch.

4, Highly Allergic Travelers). Prescribe an epinephrine autoinjector for highly allergic travelers. Options for feminine hygiene products can be limited on safari—advise travelers to pack an adequate supply.

Symptoms of many diseases acquired in Africa can surface weeks and occasionally months after exposure, sometimes long after the traveler has returned home. Obtain a travel history from all patients presenting for care.

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# SAUDI ARABIA: HAJJ & UMRAH PILGRIMAGES

Salim Parker, Joanna Gaines

## DESTINATION OVERVIEW

Hajj and Umrah are religious pilgrimages to Mecca, Saudi Arabia. Islamic religious doctrine dictates that every able-bodied adult Muslim who can afford to do so is obligated to make Hajj at least once in their lifetime. Hajj takes place from the 8th through the 12th day of the last month of the Islamic year (Dhul Hijjah). The

timing of Hajj is based on the Islamic lunar calendar; its dates shift relative to the Gregorian calendar, occurring ≈11 days earlier each successive year. In 2021, for example, Hajj took place from July 17–22, but in 2022, Hajj occurred from July 7–12. Muslims can perform Umrah, the “minor pilgrimage,” any time of the year; unlike Hajj, Umrah is not compulsory.

Normally, ≈2–3 million Muslims from >183 countries perform Hajj each year, and the Kingdom of Saudi Arabia (KSA) continues its efforts to allow an even greater number of pilgrims (hajjis) attend. In a typical year, >11,000 pilgrims travel from the United States. Due to the coronavirus disease 2019 (COVID-19) pandemic, however, only 1,000 pilgrims received permission to perform Hajj in 2020. In 2021, 60,000 were allowed, and in 2022, 1 million pilgrims made the pilgrimage. In both 2020 and 2021, because no cross-border entry into the country was permitted, KSA limited Hajj pilgrims to residents of Saudi Arabia.

## PERFORMING THE PILGRIMAGE

Most international pilgrims fly into Jeddah or Medina and take a bus to Mecca. Although the actual pilgrimage lasts only 5 days, most foreign pilgrims visit Saudi Arabia for 2–7 weeks.

### Day 1

On the first day of Hajj (8th day of Dhul Hijjah), hajjis travel by foot or by bus ≈5.5 miles (9 km) to Mina, the largest temporary city in the world, where most stay in air-conditioned tents.

### Day 2

At dawn on the 9th day of Dhul Hijjah, hajjis begin an ≈7.75-mile (12.5-km) trip by foot, shuttle bus, or train to the Plain of Arafat (Map 10-03 [all distances shown are approximate]). During the summer months, daytime temperatures can reach 122°F (50°C). The walking route features mist sprinklers, but the risk for heat-related illnesses is high, and ambulances and medical stations are positioned along the way to provide medical assistance.

Hajj climaxes on the Plain of Arafat, a few miles east of Mecca. Pilgrims spend the day in supplication, praying and reading the Quran. Being on Arafat on the 9th of Dhul Hijjah, even for only a few moments, is an absolute rite of Hajj. Any hajji who fails to reach the Plain of Arafat on that day must repeat their pilgrimage. After sunset, pilgrims begin the ≈6.5-mile (10.5-km) journey to Muzdalifah, where most sleep in the open air. Potential health threats in Muzdalifah include breathing the thick dust and inadequate or overcrowded washing and sanitation facilities.

### Day 3

At sunrise on the 10th day of Dhul Hijjah, pilgrims collect small pebbles to carry to Jamaraat, the site of multiple deadly crowd crush disasters. At Jamaraat, hajjis throw 7 tiny pebbles at the largest of 3 white pillars—the stoning of the effigy of the Devil. Afterwards, pilgrims traditionally sacrifice an animal. Some purchase vouchers to have licensed abattoirs perform this ritual on their behalf, thereby limiting potential exposure to zoonotic diseases. Other pilgrims visit farms where they sacrifice an animal themselves or have it done by an appointed representative.

### Day 4

The next morning, on the 11th day of Dhul Hijjah, hajjis go to the Grand Mosque, which houses the Kaaba (“The Cube”), and which Muslims consider the house of God. Pilgrims perform *tawaf*, 7 complete counterclockwise circuits around the Kaaba. Because each floor of the 3-level mosque can hold 750,000 people, performing *tawaf* can take hours. In addition to *tawaf*, pilgrims have the option of performing *sa’i*, walking (sometimes running) 7 times between the hills of Safa and Marwah, then drinking water from the Well of Zamzam. Hajjis can travel between Safa and Marwah via air-conditioned tunnels, which have separate sections for walkers and disabled pilgrims. At the end of the day, pilgrims return to Mina (via Jamaraat) pelting all 3 pillars with pebbles.

### Day 5

The next day, the 12th day of Dhul Hijjah, pilgrims pelt all 3 pillars in Mina with pebbles again and then, after performing a final *tawaf*, some leave Mecca, ending their Hajj. Other pilgrims stay an additional night, pelt the 3 pillars with pebbles once more the next day, perform their final *tawaf*, and end the pilgrimage. Although not required, some hajjis include a trip to Medina, where they visit the Mosque of the Prophet, home to the tomb of Mohammed.

## INFECTIOUS DISEASE RISKS

KSA can elect to restrict the entry of travelers coming from countries experiencing infectious disease outbreaks. In 2012, for example, KSA did not permit anyone from Uganda to attend Hajj





MAP 10-03 Hajj / Umrah pilgrimage

due to an Ebola outbreak in that country; the same restriction applied to Guinea, Liberia, and Sierra Leone in 2014 and 2015.

## Required Vaccines

Current Hajj vaccination requirements are available from the Embassy of the Kingdom of Saudi Arabia in the United States ([www.saudiembassy.net/hajj-and-umrah-health-requirements](http://www.saudiembassy.net/hajj-and-umrah-health-requirements)). As part of the Hajj and Umrah visa application process, KSA requires proof of vaccination against COVID-19 and meningococcal disease (for all pilgrims), polio (for pilgrims coming from countries where the disease is reported), and yellow fever (for all pilgrims arriving from yellow fever-endemic countries).

## CORONAVIRUS DISEASE 2019

In 2020 and 2021, KSA only permitted Saudi residents <65 years old to apply for pilgrimage permits. In 2022, the Saudi government reopened Hajj to pilgrims (<65 years old) from countries outside KSA. Priority was granted to those who had not previously performed the pilgrimage. For the 2020

Hajj, because COVID-19 vaccines were not yet available, KSA required Hajj pilgrims to have a negative PCR test. In 2021 and 2022, hajjis also had to provide proof of immunization with an approved COVID-19 vaccine. The Kingdom recognizes vaccines produced by Johnson & Johnson, Moderna, Oxford/Astra Zeneca, and Pfizer/BioNTech.

For current information on COVID-19 in Saudi Arabia, consult the US Embassy & Consulates in Saudi Arabia website (<https://sa.usembassy.gov/>). For the US government's COVID-19 international travel requirements and recommendations, see [www.cdc.gov/coronavirus/2019-ncov/travelers/international-travel/index.html](http://www.cdc.gov/coronavirus/2019-ncov/travelers/international-travel/index.html). All travelers going to Saudi Arabia should be up to date with their COVID-19 vaccines ([www.cdc.gov/coronavirus/2019-ncov/vaccines/stay-up-to-date.html](http://www.cdc.gov/coronavirus/2019-ncov/vaccines/stay-up-to-date.html)).

## MENINGOCOCCAL

The Hajj has been associated with meningococcal outbreaks. In 1987, serogroup A was responsible for an outbreak and carriage by returning pilgrims to certain countries that resulted in disease

among local contacts. Serogroup W was responsible for similar occurrences in 2000 and 2001.

KSA requires all pilgrims to submit a certificate of vaccination with the quadrivalent (ACYW135) vaccine against meningitis, issued no more than 3 years and no less than 10 days before arrival in Saudi Arabia. The conjugate vaccine is preferred because it is associated with reduced carriage, unlike the polysaccharide vaccine.

The KSA Ministry of Health currently advises people who are pregnant and children not to travel to the Hajj; if these groups choose to travel, however, they should receive meningococcal vaccination according to licensed indications for their age. For more details on meningococcal disease and its prevention, see Sec. 5, Part 1, Ch. 13, Meningococcal Disease.

## POLIO

Although KSA's requirement for polio vaccine does not apply to adult pilgrims from the United States, ensuring full vaccination before travel is best. All pilgrims traveling from countries where polio is reported are required to show proof of vaccination  $\leq 6$  weeks prior to departure. KSA also administers a single dose of the oral polio vaccine to pilgrims coming from countries where polio has been reported, this in addition to any polio vaccine the hajji might have received in their country of origin. About 500,000 doses of polio vaccine are given at ports of entry, representing  $>90\%$  of eligible pilgrims.

## Bloodborne Pathogens

After completing Hajj, men shave their heads. KSA limits barber licenses and requires barbers to use only disposable, single-use blades, to limit transmission of bloodborne pathogens between customers. Remind male travelers to patronize only officially licensed barbers whose establishments are clearly marked. The Centers for Disease Control and Prevention (CDC) recommends all travelers to KSA, particularly health care workers or other caretakers participating in Hajj, be up to date with routine immunizations, including hepatitis B vaccine.

## Enteric Infections & Diseases

Diarrheal disease is common during Hajj. During the pretravel consultation, inform travelers about

prevention, oral rehydration strategies, proper use of antimotility agents, and self-treatment of travelers' diarrhea (TD) with antibiotics. Most TD in hajjis is bacterial ( $\leq 83\%$ ), with smaller proportions caused by viruses and parasites. More information on TD can be found in Sec. 2, Ch. 6, Travelers' Diarrhea.

The World Health Organization recommends that travelers visiting farms, or other areas where animals are present, practice general hygiene measures, including avoiding contact with sick animals and regular handwashing before and after touching animals. Travelers should avoid consuming raw or undercooked animal products, including milk and meat.

## Respiratory Infections & Diseases

Respiratory tract infections are common during Hajj, and pneumonia is among the most common causes of hospital admission. The risk for respiratory infections underscores the need to follow recommendations from the Advisory Committee on Immunization Practices for pneumococcal conjugate and polysaccharide vaccines for pilgrims aged  $\geq 65$  years and for younger travelers with comorbidities.

Although not a requirement, the CDC strongly recommends that hajjis be fully vaccinated against seasonal influenza. Behavioral interventions, including regular handwashing with soap and water, properly wearing a face-mask, cough etiquette, and, if possible, physical distancing and contact avoidance, can help mitigate the risk for respiratory illnesses among pilgrims. Assess travelers for respiratory fitness, administer necessary vaccines, and prescribe adequate supplies of portable respiratory medications (inhalers are easier to transport than nebulizers) as needed.

Crowded conditions, even outdoors (densities can reach 9 pilgrims per square meter), can increase the probability of respiratory disease transmission during Hajj, including COVID-19 and Middle East respiratory syndrome (MERS). At the time of writing, no Hajj-associated cases of COVID-19 or MERS have been reported. Many pilgrims come from areas highly endemic for tuberculosis (TB); some arrive for Hajj with active pulmonary disease. Educate pilgrims





about the risk for TB, and instruct them to follow up with their doctor if they develop symptoms of active TB.

### MIDDLE EAST RESPIRATORY SYNDROME

MERS, caused by the Middle East respiratory syndrome coronavirus (MERS-CoV), was identified in Saudi Arabia in 2012 (see Sec. 5, Part 2, Ch. 14, Middle East Respiratory Syndrome / MERS). Domestic cases in and around the Arabian Peninsula and exported cases, including in the United States, have ranged from mild to severe; ~35% of reported cases have been fatal. Close contact with someone who has confirmed MERS-CoV infection, exposure to camels, and consuming raw or undercooked camel products (e.g., milk, urine, meat) are all considered risk factors for human infection with MERS-CoV.

### Skin Infections

Chafing caused by long periods of standing and walking in the heat can lead to bacterial or fungal skin infections. Advise travelers to keep their skin dry, use talcum powder, and to be aware of any pain or irritation caused by garments. Travelers should disinfect open sores and blisters and keep them covered. As a sign of respect, pilgrims enter the Grand Mosque with the tops of their feet uncovered; while most hajjis perform *tawaf* in their bare feet, encourage travelers with diabetes to wear appropriate, protective footwear.

### Vectorborne Diseases

*Aedes* mosquitoes, vectors for dengue, and *Anopheles* mosquitoes, vectors for malaria, are present in Saudi Arabia. Travelers should follow mosquito bite prevention measures outlined in Sec. 4, Ch. 6, Mosquitoes, Ticks & Other Arthropods. Dengue has been documented in Mecca and Jeddah, but not in association with Hajj. KSA conducts extensive spraying campaigns before Hajj, and especially targets the housing units of pilgrims from malaria- and dengue-endemic areas. The cities of Jeddah, Mecca, Medina, Riyadh (the capital of KSA), and Ta'if have no malaria transmission, and prophylaxis against malaria is neither recommended nor required for pilgrims.

## ENVIRONMENTAL HAZARDS & RISKS

### Animal Bites

Pilgrims bitten by animals should seek immediate medical attention to address any potential rabies exposure (see Sec. 4, Ch. 7, Zoonotic Exposures: Bites, Stings, Scratches & Other Hazards, and Sec. 5, Part 2, Ch. 18, Rabies).

### Climate & Sun Exposure

Heat is a threat to the health and well-being of all travelers; both heat exhaustion and heatstroke can cause incapacitation and death among pilgrims (see Sec. 4, Ch. 2, Extremes of Temperature). Travelers are particularly at risk when Hajj occurs during summer months; the average high temperatures during June–September are  $\geq 110^{\circ}\text{F}$ . High temperatures combined with high humidity can lead to a heat index indicative of an extreme heat warning. High heat alone can exacerbate chronic conditions.

Depending on the exact location of their lodgings within Mina and whether they use trains or shuttle buses to get from one location to another, hajjis might walk up to  $\approx 35\text{--}40$  miles ( $\approx 55\text{--}65$  km) over the 5 days; about 45% of pilgrims walk during the Hajj rituals. Counsel pilgrims to stay well hydrated, wear sunscreen, and seek shade or use umbrellas when possible. Religious leaders have ruled that it is permissible for hajjis to perform some rituals after dark. In addition, except for a pilgrim's required presence on Arafat on the 9th day of Dhul Hijjah, most other compulsory rituals can be postponed, done by proxy, or redeemed by paying a penalty.

## OTHER HEALTH CONSIDERATIONS

### Chronic Health Conditions

Hajj is arduous, even for young, healthy pilgrims. Because many Muslims wait until they are older before performing Hajj, they are more likely to have chronic health conditions. Travelers caught up in the experience of Hajj or Umrah might forget to take their usual medications. People with chronic medical conditions should have a health assessment before traveling to Hajj. Tailor a plan for each traveler's unique risks, including

adjusting the usual medical regimen if necessary, ensuring an adequate supply of medications, and providing education about symptoms that indicate a condition requiring urgent attention.

Pilgrims with diabetes should have a customized management plan that enables them to meet the arduous physical challenges of the Hajj. They should bring adequate amounts of all medications, plus syringes and needles if they are insulin dependent. They also should carry an emergency kit with them on their pilgrimage; the kit should include easily accessible carbohydrate sources, glucagon, a glucometer and test strips, urine ketone sticks to evaluate for ketoacidosis, and a list of medications and care plans. Emphasize the importance of wearing durable and protective footwear to reduce the incidence of minor foot trauma, which can lead to infections.

## Menstruation

Muslim law prohibits a person who is menstruating from performing *tawaf*. All other rituals are independent of menses. Because pilgrims generally know well in advance that they will be making a pilgrimage, those who intend to manipulate their menstrual cycle should consult with a physician 2–3 months before the journey.

## SAFETY & SECURITY

### Fire

Fire is a potential risk during Hajj. In 1997, open stoves set tents on fire, and the resulting blaze killed 343 pilgrims and injured >1,500. In 2015, a hotel caught fire and >1,000 pilgrims were evacuated. KSA no longer allows pilgrims to erect their

own lodgings or prepare their own food; permanent fiberglass structures have replaced formerly makeshift accommodations.

## Traffic-Related Injuries

As in other countries, motor vehicle crashes are the primary safety risk for US travelers to KSA. Remind Hajj pilgrims of the importance of seatbelt use in any vehicle, including buses (see Sec. 8, Ch. 5, Road & Traffic Safety). Encourage pilgrims to be mindful of their own safety when they walk long distances through or near dense traffic.

## Trauma

Trauma is a major cause of injury and death during Hajj. Hajj is associated with dense crowding, leading to crush disasters or stampedes. Thousands of pilgrims were killed during a crush at Mina in 2015, making it the deadliest Hajj disaster on record. Death usually results from asphyxiation or head trauma, and large crowds limit the movement of emergency medical services, making prompt rescue and treatment difficult.

## AVAILABILITY & QUALITY OF MEDICAL CARE

Travelers who become ill during Hajj have access to medical facilities located in and around the holy sites. An estimated 25,000 health care workers are typically in attendance, and medical services are offered free of charge to all pilgrims. For safety reasons, KSA advises that children, the frail elderly, seriously ill, and pregnant people postpone Hajj and Umrah.

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# SOUTH AFRICA

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## DESTINATION OVERVIEW

South Africa is “a world in one country.” Diverse geography that ranges from lush subtropical regions, old hardwood forests, and sweeping Highveld vistas to the deep desert of the Kalahari, along with expansive game reserves, are one part of this world. The people who live in South Africa, whose origins are in Africa, Europe, India, and Southeast Asia, make up another; they bring a vibrant, artistic, and culinary global culture to the country. All these, combined with access to the modern conveniences of a developed infrastructure, make the country truly unique.

South Africa is the only country in the world with 3 capital cities. Cape Town, the seat of Parliament, is the legislative capital. The president and cabinet and most foreign embassies have their offices in the administrative capital, Tshwane (Pretoria). South Africa’s Supreme Court of Appeal is in Bloemfontein, the judicial capital. And although not considered a capital, Johannesburg, the most populous city in the country, is the seat of the Constitutional Court of South Africa.

South Africa has experienced a surge in both business and pleasure travel in the past 2 decades; visitors arrive from within the African continent as well as from North America and Europe. Business travelers typically head to the commercial centers of Cape Town, Durban, and Johannesburg. Tourist itineraries are as diverse as the country itself. From Cape Town, for example, visitors can follow the wine route of the Western

Cape, exploring the many vineyards along the way, or they can drive along the spectacular coast. Going east from Cape Town, travelers can visit the southernmost point of Africa at Cape Agulhas—where the Indian and Atlantic Oceans meet in a roar of foam—and continue on to the small scenic towns of Knysna and Plettenberg Bay. South Africa is also a common destination for humanitarian aid workers, missionaries, and students. A sizable number of South Africans live outside the country; those returning home for a visit are considered VFR travelers (see Sec. 9, Ch. 9, Visiting Friends & Relatives: VFR Travel).

Game reserves located throughout the country attract many tourists (see Map 10-04). The largest, the Kruger National Park, is a world famous, highly accessible game reserve in the far northeast of the country along the border with Mozambique. KwaZulu-Natal has a fair number of game parks, including Hluhluwe Imfolozi Park and Saint Lucia, set inland from Durban; and the Eastern Cape has several parks, including Addo Elephant Park and Shamwari Private Game Reserve, easily accessed from Gqeberha (Port Elizabeth) on the southern coast. Many small, luxury game reserves have emerged to cater to high-end travelers.

## INFECTIOUS DISEASE RISKS

All travelers to South Africa should be up to date on routine vaccinations, including diphtheria-tetanus-pertussis and measles-mumps-rubella.



MAP 10-04 South Africa

## Enteric Infections & Diseases

### LISTERIOSIS

During 2017–2018 a very large outbreak of listeriosis was linked to a contaminated processed meat product from a single producer. The outbreak ended after the plant was closed, decontaminated, and refurbished.

### TRAVELERS' DIARRHEA

As with most destinations, the risk for travelers' diarrhea in South Africa depends on style of travel and travelers' food choices (see Sec. 2, Ch. 6, Travelers' Diarrhea, and Sec. 2, Ch. 8, Food & Water Precautions). In most major cities, tap water is safe to drink, but in more rural areas, travelers should consume only bottled water. The usual spectrum of bacterial, viral, and parasitic infections exists in South Africa. Educate travelers about the prevention and self-treatment of travelers' diarrhea.

### TYPHOID FEVER

Sporadic cases of typhoid are reported in South Africa, but overall, the risk for this disease to travelers is low.

## Respiratory Infections & Diseases

### CORONAVIRUS DISEASE 2019

People planning travel to South Africa can review the most current coronavirus disease 2019 (COVID-19) situation information and guidance from the National Institute for Communicable Diseases ([www.nicd.ac.za](http://www.nicd.ac.za)). They also should consult the US Embassy & Consulates in South Africa website (<https://za.usembassy.gov/>). For the US government's COVID-19 international travel requirements and recommendations, see [www.cdc.gov/coronavirus/2019-ncov/travelers/international-travel/index.html](http://www.cdc.gov/coronavirus/2019-ncov/travelers/international-travel/index.html). All travelers going to South Africa should be up to date with their

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COVID-19 vaccines ([www.cdc.gov/coronavirus/2019-ncov/vaccines/stay-up-to-date.html](http://www.cdc.gov/coronavirus/2019-ncov/vaccines/stay-up-to-date.html)).

## INFLUENZA

Influenza viruses typically circulate during the winter months in South Africa, with peak transmission occurring during June–August. The burden of influenza in South Africa is significant, with ≈40,000 hospitalizations and ≈12,000 deaths each year. Travelers should have an influenza vaccination with the recommended Southern Hemisphere formulation, if available.

## Sexually Transmitted Infections & HIV

South Africa has the largest estimated number of people living with HIV of any country in the world. The prevalence of HIV infection is ≈19% among people aged 15–49 years, and the prevalence among sex workers is considerably higher. Other sexually transmitted infections (STIs) also are present at high rates, including antimicrobial-resistant gonorrhea (ciprofloxacin resistance in 70%–80% of cases). Dual therapy with azithromycin and ceftriaxone is recommended for travelers returning from South Africa who are diagnosed with gonorrhea. Make travelers aware of the significant HIV and STI risks in South Africa and the importance of using condoms when having sex with someone whose HIV or STI status is unknown. Additionally, counsel travelers planning to engage in high-risk sexual encounters while in South Africa about preexposure prophylaxis (PrEP). For more information see Sec. 5, Part 2, Ch. 11, Human Immunodeficiency Virus / HIV; Sec. 9, Ch. 12, Sex & Travel; and Sec. 11, Ch. 10, Sexually Transmitted Infections.

## Soil- & Waterborne Infections

### SCHISTOSOMIASIS

*Schistosoma* spp. parasites, found throughout Africa, can be present in any body of unchlorinated, fresh water (see Sec. 5, Part 3, Ch. 20, Schistosomiasis). *Schistosoma haematobium* is the dominant species in South Africa, but *S. mansoni* occasionally has been detected. Advise travelers to avoid swimming in lakes, streams, and along dams in Limpopo, Mpumalanga, North West, KwaZulu-Natal, the Eastern Cape, and Gauteng

provinces. By contrast, the provinces of Western Cape, Northern Cape, and most of Free State are considered schistosomiasis-free.

## Vectorborne Diseases

### MALARIA

*Plasmodium falciparum* malaria occurs along the border with Zimbabwe and Mozambique in the Mopani and Vhembe Districts of Limpopo Province; in the Ehlanzeni District of Mpumalanga Province; and in the uMkhanyakude District of KwaZulu-Natal Province. Kruger National Park spans 2 provinces, Mpumalanga and Limpopo, and is considered endemic for malaria with seasonal transmission. Visitors to these areas should take malaria chemoprophylaxis and use mosquito bite precautions; preventing mosquito bites is the first line of defense against malaria (see Sec. 4, Ch. 6, Mosquitoes, Ticks & Other Arthropods; Sec. 5, Part 3, Ch. 16, Malaria).

In March 2017, after a seasonal malaria outbreak in Limpopo Province, the Centers for Disease Control and Prevention (CDC) received reports of malaria in the western Waterberg District, an area with historic malaria transmission. Subsequent sporadic cases have been reported there (see Sec. 2, Ch. 5, Yellow Fever Vaccine & Malaria Prevention Information, by Country).

The South African National Department of Health recommends that travelers practice mosquito avoidance year-round in malaria risk areas and take malaria chemoprophylaxis during September–May. CDC, however, recommends chemoprophylaxis at all times of the year. Artemisinin combination therapy remains effective for treatment; artemether lumefantrine is the first-line therapy for uncomplicated infection, and artesunate is widely available for severe malaria treatment. Rare cases of so-called Odyssean, “taxi,” or “suitcase” malaria have been reported in Gauteng province, likely related to relocation of infected mosquitoes from endemic areas.

### RICKETTSIAL DISEASES

African tick-bite fever is common in South Africa (see Sec. 5, Part 1, Ch. 18, Rickettsial Diseases). The disease is characterized by an acute febrile illness,

eschar at the bite site, regional adenopathy, and in some cases a maculopapular or petechial rash. The spectrum of illness varies from mild to, rarely, more severe disease resulting in hemorrhage and multisystem pathology. Campers and hikers in rural areas are especially at risk and should take measures to prevent tick bites (see Sec. 4, Ch. 6, Mosquitoes, Ticks & Other Arthropods). Travelers taking doxycycline for malaria chemoprophylaxis might have some protection against tick-bite fever, but no studies exist to support or refute this viewpoint. Taking doxycycline solely as prophylaxis for tick-bite fever (as opposed to taking it for malaria chemoprophylaxis) is not recommended.

## YELLOW FEVER

There is no risk for yellow fever in South Africa.

### YELLOW FEVER VACCINE REQUIREMENTS

South Africa requires a valid International Certificate of Vaccination or Prophylaxis (ICVP; <https://wwwnc.cdc.gov/travel/page/icvp>) documenting yellow fever vaccination  $\geq 10$  days before arrival in South Africa for all travelers aged  $\geq 1$  year, traveling from or transiting for  $>12$  hours through the airport of a country with risk for yellow fever virus transmission. South Africa considers a one-time dose of yellow fever vaccine (properly documented with an ICVP) to be valid for the life of the traveler. Any traveler not meeting this requirement can be refused entry to South Africa or quarantined for  $\leq 6$  days. Unvaccinated travelers presenting a medical waiver signed by a licensed health care provider are generally allowed entry.

Travelers going to, or transiting through, South Africa are advised to seek the most current information by consulting the CDC Travelers' Health website (<https://wwwnc.cdc.gov/travel/>), the websites of the US embassy and consulates in South Africa (<https://za.usembassy.gov>), and the embassy of South Africa in Washington, DC ([www.saembassy.org](http://www.saembassy.org)).

## Viral Hemorrhagic Fevers

Rare cases of Crimean-Congo hemorrhagic fever have been reported in travelers visiting farms and rural areas of South Africa. It remains an occupational disease in animal health workers, farmers, and hunters.

## ENVIRONMENTAL HAZARDS & RISKS

### Animal Bites & Rabies

Rabies is endemic to South Africa and dogs are the major source for human rabies cases. The KwaZulu-Natal and Eastern Cape provinces have the highest incidence of rabies. Travelers have no way of telling whether an animal is rabid and should avoid all contact with animals. Instruct travelers to wash any bite or scratch from an animal with soap and water immediately and to see a clinician as soon as possible.

Rabies vaccine and rabies immunoglobulin are available for postexposure prophylaxis in the main centers, but access and availability will vary, and these treatments will likely be less available in rural areas. Consider preexposure rabies prophylaxis for travelers spending time in rural areas (see Sec. 4, Ch. 7, Zoonotic Exposures: Bites, Stings, Scratches & Other Hazards, and Sec. 5, Part 2, Ch. 18, Rabies). Most of the new formulations of equine rabies immune globulin (RIG) used in the South African public health system are potent, highly purified, and safe. Some private medical centers stock human RIG.

### Climate & Sun Exposure

Latitude and elevation are major factors in the amount of solar ultraviolet radiation (UVR) that reaches the Earth's surface. South Africa's latitude spans 22°S to 34°S, and its elevation ranges from sea level to 3,482 m ( $\approx 11,500$  ft), although the average height of Highveld plateau in the interior of the country is around 1,200 m ( $\approx 4000$  ft). In some areas of South Africa (e.g., Durban, Pretoria), the UV index exceeds 11 in the summer months, which is considered very high. Given the frequent cloud-free skies, travelers should wear a broad-brimmed hat, sunglasses, a broad-spectrum sunscreen of  $\geq 30$  SPF on exposed skin, and sun-protective clothing to lessen the likelihood of sun damage and sun burn (see Sec. 4, Ch. 1, Sun Exposure, for more guidance).

## SAFETY & SECURITY

### Crime

Over the past several years, South Africa has experienced a rise in violent crime, including armed robberies, car jackings, home invasions, and rape





(see Sec. 4, Ch. 11, Safety & Security Overseas). Stress awareness for personal safety and security with all travelers. Travelers should also seek local guidance on appropriate security precautions to take in specific areas.

## Political Unrest

In mid-2021, in the context of a struggling economy, made worse by the COVID-19 pandemic and the arrest of former President Jacob Zuma, South Africa experienced major political unrest. Violent clashes between protesters and police, along with looting, occurred primarily in metropolitan areas, especially Durban and Johannesburg.

With a significant unemployment rate, especially among youth, unrest is a perpetual threat. To stay informed and avoid being accidentally caught in areas of potential unrest, travelers should enroll in the US Department of State's Smart Traveler Enrollment Program (<https://step.state.gov/step>) before traveling, and follow the local news while in South Africa.

## Traffic-Related Injuries

South Africa has a modern road system, which frequently leads to travel at high speeds. Drivers should be alert for dangerous driving practices, stray animals, and poor-quality roads in remote rural areas (see Sec. 8, Ch. 5, Road & Traffic Safety).

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## AVAILABILITY & QUALITY OF MEDICAL CARE

Although South Africa has a wide range of living standards, most visitors experience standards comparable to those in high-income countries. Fewer visitors go to rural areas or to the lower-income townships found outside most towns and cities. Adventure-seekers, hikers, and missionaries will experience a wider range of living standards. Similarly, the availability and quality of health care is variable. Middle- and upper-income South Africans have a standard of health comparable to that of North Americans, with access to private sector, world-class medical facilities, many of which also cater to an increasing number of visitors coming to South Africa for medical tourism. By contrast, many South Africans live in areas with limited amenities, experience significant disease transmission, and rely on frequently under-resourced public sector facilities for treatment.

## Medical Tourism

Because of the affordable and high-quality private health sector in South Africa, medical tourism is steadily on the rise. Travelers to South Africa for medical tourism frequently access cancer treatment, cosmetic surgery, dental, fertility, or transplant services (see Sec. 6, Ch. 4, Medical Tourism).

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