

HEALTH & IMMUNIZATION INFORMATION

FUNDACION CENTRO DE ESTUDIOS INTERAMERICANOS (CEDEI)

*This document contains recommendations from the Centers for Disease Control & Prevention (CDC) in Atlanta, Georgia. Some information specific to countries other than Ecuador and Peru has been omitted, and we have added supplementary information where appropriate. This document is intended to assist you and your physician in determining what health precautions you should take and what immunizations you should have. CDC recommends you see your doctor **4-6 weeks before you trip** to allow time for immunizations to take effect.*

THEORY OF IMMUNIZATION

The various recommendations for immunizing infants, children, and adults against diseases are based on medical knowledge, the availability of safe vaccines, other scientific knowledge, and judgments by public health officials and doctors.

Each vaccine has both benefits and risks associated with its use, and no vaccine is completely safe or completely effective. Vaccines are beneficial because they prevent disease and infection, and their associated effects. These effects may be mild symptoms such as a body rash, or they may be more serious problems such as paralysis or death. Depending on the vaccine, the benefits may vary from partial protection to nearly-complete protection against the disease or its effects.

The risks associated with vaccine usage range from common, trivial, and inconvenient side effects, such as mild swelling or low grade fever to (on rare occasions) severe and life-threatening conditions.

The decision to use a particular vaccine is based on its benefits, costs, and associated risks. For each vaccine, recommendations are developed for its use, and these describe who should receive it, when they should receive it, and how it should be administered. These immunization recommendations are developed to apply to a large population; therefore, the recommendations may vary for specific individuals or even between countries.

Finally, the relative balance of benefits and risks may change as diseases are controlled or eradicated. For example, because smallpox has been eradicated throughout the world, the risk of side effects associated with the smallpox vaccine now exceeds the risk of smallpox itself; consequently, smallpox vaccines are no longer routinely given to the general public.

TROPICAL SOUTH AMERICA

Countries in this region: Bolivia, Brazil, Colombia, Ecuador, French Guiana, Guyana, Paraguay, Peru, Suriname, and Venezuela. Travelers to Tropical South America may be exposed to potential diseases from a number of sources. *The most frequently reported illness is traveler's diarrhea, but there are other diseases which are unique to Tropical South America or the tropics. These diseases are transmitted by insects, contaminated food and water, or close contact with infected people. Specific diseases are discussed under each of these topical headings. In order to reduce the risk of infection travelers must (1) protect themselves from insects, (2) ensure the quality of their food and drinking water, and (3) be knowledgeable about potential diseases in the region to be visited.* Finally, diseases are not restricted to cleanly defined geographical areas, i.e. mosquitoes can fly over city or country borders; therefore, all travelers should protect themselves by taking the basic preventive precautions.

DISEASES TRANSMITTED BY INSECTS

Many diseases are transmitted through the bite of infected insects such as mosquitoes, flies, fleas, ticks, and lice. In general, *travelers must protect themselves from insect bites by wearing proper*

clothing, using bednets, applying an insect repellent to exposed skin and clothing, and if possible, avoiding high risk situations, i.e. outdoor activities during night time hours from dusk to dawn when mosquitoes bite, unscreened living accommodations, etc. If a mosquito net is unlikely to be available, consideration should be given to purchasing a portable mosquito net (or you may purchase netting called *tul* at any fabric store in Cuenca).

MALARIA Malaria is a serious parasitic infection transmitted to humans by a mosquito. These mosquitoes bite at night from dusk to dawn. Symptoms range from: fever and flu-like symptoms to chills, general achiness, tiredness. If left untreated, malaria can cause anemia, kidney failure, coma, and death. Drugs are available to help prevent a malaria infection. However, in spite of all protective measures, travelers occasionally develop malaria. Therefore, while traveling, and up to one year after returning home, travelers should seek medical evaluation for any flu-like illness.

Risk: Ecuador- risk in all areas, *except* no risk at altitudes higher than 1,500 meters (4,921 feet). No risk in Guayaquil, Quito, the central highland tourist areas (e.g. Cuenca), and the Galapagos Islands. NOTE: students who choose to travel to Macas for the mid term break will be below 1,500 meters (4,921 feet). Peru: Risk in all departments except Arequipa, Moquegua, Puno, and Tacna. Travelers who visit the city of Lima or the highland tourist areas (Cuzco, Machu Picchu, Lake Titicaca) are not at risk.

Prevention: Travelers to *risk areas* in the countries listed below should take one of the following drugs: mefloquine (brand name Lariam®), doxycycline, or Malarone™.

- Bolivia
- Brazil
- Colombia
- **Ecuador**
- French Guiana
- Guyana
- **Peru**
- Suriname
- Venezuela

Mefloquine (brand name Lariam®)

Directions for use

- The adult dosage is 250 mg salt (one tablet) once a week.
- Take the first dose of mefloquine 1 week before arrival in the malaria-risk area.
- Take mefloquine once a week, on the same day of the week, while in the malaria-risk area.
- Take mefloquine once a week for 4 weeks after leaving the malaria-risk area.
- Mefloquine should be taken on a full stomach, for example, after dinner.

Most travelers who take mefloquine have few, if any, side effects. The most commonly reported minor side effects include nausea, dizziness, difficulty sleeping, and vivid dreams. Mefloquine has very rarely been reported to cause serious side effects, such as seizures, hallucinations, and severe anxiety. Minor side effects usually do not require stopping the drug. Travelers who have serious side effects should see a health care provider.

Do NOT take mefloquine if you have

- Ever had an allergic reaction to mefloquine;
- Epilepsy or other seizure disorders;
- A history of severe mental illness or other psychiatric disorders;
- Been diagnosed or treated for an irregular heartbeat.

Alternatives for travelers who cannot or choose not to take mefloquine include doxycycline or Malarone™.

Doxycycline

Directions for use

- The adult dosage is 100 mg once a day.
- Take the first dose of doxycycline 1 or 2 days before arrival in the malaria-risk area.
- Take doxycycline once a day, at the same time each day, while in the malaria-risk area.
- Take doxycycline once a day for 4 weeks after leaving the malaria-risk area.

Doxycycline side effects and warnings

- Taking doxycycline may cause travelers to sunburn faster than normal. To prevent sunburn, avoid midday sun, wear a high-SPF sunblock, wear long-sleeved shirts, long pants, and a hat.
- Take doxycycline on a full stomach to lessen nausea; do not lie down for 1 hour after taking the drug to prevent reflux of the drug (backing up into the esophagus).
- Women who use doxycycline may develop a vaginal yeast infection. Take an over-the-counter yeast medication with you on your trip for use if vaginal itching or discharge develops.

Do NOT take doxycycline if you are pregnant.

Do NOT give doxycycline to children under the age of 8; teeth may be permanently stained.

Alternatives for travelers who cannot or choose not to take doxycycline include mefloquine or Malarone™.

Malarone is a new antimalarial drug in the United States. Malarone is a combination of two drugs (atovaquone and proguanil) and is an effective alternative for travelers who cannot or choose not to take doxycycline or mefloquine.

Directions for use

- The adult dosage is 1 adult tablet (250 mg atovaquone/100 mg proguanil) once a day.
- Take the first dose of Malarone 1 to 2 days before travel to the malaria-risk area.
- Take Malarone once a day during travel in the malaria-risk area.
- Take Malarone once a day for 7 days after leaving the malaria-risk area.
- Take the dose at the same time each day with food or milk.

Malarone Side Effects and Warnings

Although side effects are rare, abdominal pain, nausea, vomiting, and headache can occur.

Malarone should not be taken by patients with severe renal impairment.

Pregnant women or women breast-feeding infants weighing less than 11 kg (24 lbs) should not take Malarone to prevent malaria.

YELLOW FEVER

Yellow fever is a viral disease found in parts of Africa and South America. It is transmitted to humans by a mosquito bite. Certain countries REQUIRE a yellow fever vaccination. Some countries require a Yellow Fever Vaccination for all travelers, while others require only a vaccination if a traveler is coming FROM either areas infected with yellow fever or areas where yellow fever transmission has occurred (called “endemic” areas).

Risk: Ecuador- provinces of Morona-Santiago, Napo, Pastaza, Sucumbios, and Zamora Chinchipe. Peru- departments of Amazonas, Ancash, Ayacucho, Cusco, Huanuco, Junin, Loreto, Madre de Dios, Puno, Pasco, San Martin, and Ucayali. NOTE: Students planning to travel to Macas (rainforest) for the mid-term break will be traveling in the province of Morona-Santiago.

Prevention: If your travel plans include traveling to or from a South American country that is infected with yellow fever or is located in areas where yellow fever transmission has occurred

(endemic areas), **then the easiest and safest thing to do is to get a yellow fever vaccination and a signed certificate.** Be sure to read the Yellow Fever Certificate information below, the instructions, and the country-by-country requirements on this page.

Yellow fever vaccination, a 1-dose shot, may be administered to adults and to children over 9 months of age. This vaccine is administered only at designated yellow fever centers, usually your local health department. If at continued risk, a booster is needed every 10 years.

In addition to the vaccine, travelers should use measures to reduce exposure to mosquitoes, and protect themselves from mosquito bites. These mosquitoes bite mainly during the evening and morning hours. See the section "*Preventing Insect Bites*" below.

Yellow Fever Certificate: After immunization an *International Certificate of Vaccination* is issued and is valid 10 days after vaccination to meet entry and exit requirements for all countries. The certificate is good for 10 years. You must take the certificate with you. Travelers who have a medical reason not to receive the yellow fever vaccine should obtain a medical waiver. Most countries will accept a medical waiver for persons with a medical reason not to receive the vaccine (e.g. infants less than 4 months old, pregnant women, persons hypersensitive to eggs, or those with an immunosuppressed condition). When required, CDC recommends obtaining written waivers from consular or embassy officials before departure. A physician's letter clearly stating the medical reason not to receive the vaccine might be acceptable to some governments. It should be written on letterhead stationery and bear the stamp used by a health department or official immunization center to validate the *International Certificate of Vaccination*.

DENGUE FEVER Dengue fever is primarily a viral infection transmitted by mosquito bites. The mosquitoes are most active during the day, especially around dawn and dusk, and are frequently found in or around human habitations. The illness is flu-like and characterized by sudden onset, high fever, severe headaches, joint and muscle pain, and rash. The rash appears 3-4 days after the onset of fever. Since there is no vaccine or specific treatment available, prevention is important.

Risk: Dengue fever occurs endemically in many urban centers in South America and as periodic epidemics. It occurs in both rural and urban areas and poses a health hazard to travelers; the risk is highest in urban centers.

Prevention: There is no vaccine for dengue fever, therefore the traveler should avoid mosquito bites. These mosquitoes bite mainly in the daytime. See the section "*Preventing Insect Bites*" listed below.

OTHER INSECT DISEASES

Other diseases spread by mosquitoes, sand flies, black flies, or other insects are prevalent, especially in rural areas. These diseases include: Filariasis (mosquito), Leishmaniasis (sand fly), Onchocerciasis (black flies), American Trypanosomiasis, Chagas' Disease ("cone nose or kissing" bug), Oropouche Virus (gnats or midges), typhus (lice), and Plague (fleas). Details of these and other insect diseases can be found in the document titled *Other Insect Diseases*, on CDC website. Also, read the next section "*Preventing Insect Bites*".

PREVENTING INSECT BITES

To reduce mosquito bites travelers should remain in well-screened areas, use mosquito nets, and wear clothes that cover most of the body. Travelers should also take insect repellent with them to use on any exposed areas of the skin. The most effective compound is DEET (N, N-diethyl meta-toluamide), an ingredient in most insect repellents. However, DEET containing insect repellents should always be used according to label directions and sparingly on children. Avoid applying high-concentration (greater than 35%) products to the skin, particularly on children, and refrain

from applying repellent to portions of the hands that are likely to come in contact with the eyes and mouth. Pediatric insect repellents with 6-10% DEET are available. Toxic reactions or other problems have rarely developed after contact with DEET. Travelers should also purchase a flying insect-killing spray to use in living and sleeping areas during the evening and night. For greater protection clothing and bednets can be soaked in or sprayed with *Permethrin*, which is an insect repellent licensed for use on clothing. If applied according to the directions, permethrin will repel insects from clothing for several weeks. Portable mosquito bednets, DEET containing repellents, and permethrin can be purchased in hardware, back-packing, and military surplus stores.

DISEASES TRANSMITTED THROUGH FOOD AND WATER

Food and waterborne diseases are the number one cause of illness to travelers and are very common in Tropical South America. Traveler's diarrhea is the most frequent health problem for travelers. It can be caused by viruses, bacteria, or parasites which are found universally throughout the region. Transmission is most often through contaminated food or water. Infections cause diarrhea and vomiting (typhoid fever, cholera, and parasites), liver damage (hepatitis), or muscle paralysis (polio). For additional detailed precautions, be sure to read the document *Traveler's Diarrhea & Food and Water Precautions*, CDC website.

CHOLERA Cholera is an acute intestinal infection. Most infected persons have no symptoms or only mild diarrhea. However, persons with severe disease can die within a few hours after onset due to loss of fluid and salts through profuse diarrhea and, to a lesser extent, through vomiting.

Risk: Most recently, cholera outbreaks have occurred in parts of Latin America.

Prevention: Travelers to cholera infected areas should follow the standard food and water precautions of eating only thoroughly cooked food, peeling their own fruit, and drinking either boiled water, bottled carbonated water, or bottled carbonated soft drinks. Persons with severe cases respond well to simple fluid and electrolyte-replacement therapy, but medical attention must be sought quickly when cholera is suspected. At the present time, the manufacture and sale of the only licensed cholera vaccine in the United States (Wyeth-Ayerst) has been discontinued. It has not been recommended for travelers because of the brief and incomplete immunity it offers. No cholera vaccination requirements exist for entry or exit in any country.

TYPHOID FEVER Typhoid fever is an acute, life-threatening febrile illness caused by the bacterium *Salmonella typhi*. The disease is characterized by fever, headache, malaise, anorexia, splenomegaly, and a relative bradycardia. Many mild and atypical infections occur.

Risk: Travelers should be cautioned that typhoid vaccination is not 100% effective and is not a substitute for careful selection of food and drink. Travelers to Tropical South America are at risk for typhoid fever, especially when traveling to smaller cities, villages, or rural areas. Typhoid fever is more common in Brazil, Colombia, **Ecuador**, French Guiana, and **Peru**.

Prevention: By drinking only bottled or boiled water and eating only thoroughly cooked food, a traveler lowers the risk of infection. Currently available vaccines have been shown to protect 70-90% of the recipients. Therefore, even vaccinated travelers should be cautious in selecting their food and water. Two available vaccines provide equivalent protection against typhoid fever if taken at least one week ahead of travel time. The oral vaccine consists of 4 capsules taken every other day over a seven day period and requires a booster every five years. Reactions are rare and include nausea, vomiting, abdominal cramps, and skin rash. The new, injectable ViCPS vaccine consists of 1 shot and requires a booster every two years.

HEPATITIS A Hepatitis A is an enterically transmitted viral disease that causes fever, malaise, anorexia, nausea, and abdominal discomfort, followed within a few days by jaundice. The disease ranges in clinical severity from no symptoms to a mild illness lasting 1 to 2 weeks to

a severely disabling disease lasting several months. Transmission can occur by direct person-to-person contact; through exposure to contaminated water, ice, or shellfish harvested from sewage-contaminated water; or from fruits, vegetables, or other foods that are eaten uncooked, and which can become contaminated during harvesting or subsequent handling.

Risk: Travelers are at high risk for hepatitis A, especially if travel plans include visiting rural areas and extensive travel in the countryside, frequent close contact with local persons, or eating in settings of poor sanitation. A study has shown that many cases of travel-related hepatitis A occur in travelers to developing countries with "standard" itineraries, accommodations, and food consumption behaviors.

Prevention: CDC recommends hepatitis A vaccine or IG for protection against hepatitis A. Two HAV vaccines are currently licensed in the United States: HAVRIX® and VAQTA®. Both HAVRIX® and VAQTA® are currently licensed in two formulations, and the formulation and number of doses vary according to the recipient's age. Immune Globulin (IG) is recommended before travel for persons 2 years of age or older. For persons electing to receive IG, a single dose (0.02 ml/kg of body weight) of IG is recommended for travel of less than three months.

Pre-vaccination testing is not indicated for children because of their expected low prevalence of prior HAV infection. For some adult travelers who are likely to have had hepatitis in the past (i.e., persons older than 40 yrs of age, persons born in parts of the world with intermediate or high rates of hepatitis A, or persons with clotting disorders), screening for hepatitis A antibodies before travel may be used to determine susceptibility and eliminate unnecessary vaccination or IG prophylaxis.

PARASITES Parasitic infections are acquired by eating or drinking contaminated food or water, through direct contact with soil or water containing parasites or their larva, or by contact with biting insects. Symptoms and evidence of infection may include, but are not limited to, fever, swollen lymph nodes, rashes or itchy skin, digestive problems such as abdominal pain or diarrhea, eye problems, and anemia.

Risk: Travelers to Tropical South America are at risk of parasites and infection may occur in several ways: by eating undercooked meats infected with parasites or their larva; by eating food or drinking water contaminated with parasites or their eggs; by contact with soil or water infected with parasites; or through insect bites. Several types of parasites can penetrate intact skin and travelers are advised to wear shoes and avoid swimming, wading, or washing in fresh water (see "Schistosomiasis").

Prevention: Travelers should eat only thoroughly cooked food, drink safe water, wear shoes, refrain from swimming in fresh water, and avoid contact with insects, particularly mosquitoes, biting flies, gnats, and midges.

DISEASES TRANSMITTED THROUGH INTIMATE CONTACT WITH PEOPLE

HIV/AIDS Human immunodeficiency virus (HIV) which causes acquired immunodeficiency syndrome or AIDS is found primarily in blood, semen, and vaginal secretions of an infected person. HIV is spread by sexual contact with an infected person, by needle-sharing among injecting drug users, and through transfusions of infected blood and blood clotting factors. Babies born to HIV-infected women may become infected before, during, or shortly after birth. In the United States blood is screened for HIV antibodies, but this screening may not take place in all countries. Scientific studies have revealed no evidence that HIV is transmitted by air, food, water, insects, inanimate objects, or casual contact. Even though HIV antibodies are normally detected on a test within 6 months after infection, the period between infection and development of disease symptoms (incubation period) may be 10 years or longer. Treatment has prolonged the survival of some HIV infected persons, but there is no known cure or vaccine

available. For additional information, contact CDC website , *HIV Transmission, and Prevention of HIV Infection*.

Risk: The risk of HIV infection for international travelers is generally low. Factors to consider when assessing risk include the extent of direct contact with blood or secretions and of sexual contact with potentially infected people. In addition, the blood supply in developing countries might not be adequately screened.

Prevention: No effective vaccine has been developed for HIV. Travelers should avoid sexual or needle-sharing contact with a person who is infected with HIV. If a blood transfusion is necessary, screened blood should be from an HIV-negative blood donor.

Recommendations: Travelers should be advised to avoid activities known to carry risks for infection with HIV.

HEPATITIS B Hepatitis B is a viral infection of the liver that can cause lifelong infection, cirrhosis of the liver, liver cancer, liver failure, or death. Primarily, hepatitis B is transmitted through activities which result in the exchange of blood or blood derived fluids and/or through sexual activity, either heterosexual or homosexual, with an infected person. Any unscreened blood or blood product, as well as unsterilized needles, or contact with potentially infected people who have open skin lesions due to impetigo, scabies, and scratched insect bites, heightens the potential for infection to the traveler.

Risk: The risk of hepatitis B virus infection is highest in the interior Amazon Region and moderate for the rest of Tropical South America. The risk to the individual international traveler is determined by the extent of (1) direct contact with blood or other body fluids, etc.; (2) intimate sexual contact with an infected person; (3) the duration of travel.

Prevention: Hepatitis B vaccination should be considered for those travelers to countries with high to intermediate rates of hepatitis B. Travelers who will be providing health care and have a reasonable risk of exposure to blood or body fluids containing blood should be vaccinated. Vaccination should ideally begin 6 months before travel, in order to complete the full series. The full three dose series should be completed for optimal protection. There is an alternate four-dose schedule that may provide protection if the first three doses can be delivered before.

Recommendations: CDC recommends vaccination for any of the following people: any health care worker (medical, dental, or laboratory) whose activities might result in blood exposure; any traveler who may have intimate sexual contact with the local population; any long-term (6 months or more) traveler, e.g., teachers, who will reside in rural areas or have daily physical contact with the local population; or any traveler who is likely to seek either medical, dental, or other treatment in local facilities during their stay. Hepatitis B vaccination is not required for travel to any country.

OTHER DISEASES

RABIES Rabies is a viral infection that affects the central nervous system. It is transmitted by animal bites which introduce the virus into the wound. Although dogs are the main reservoir of disease, all warm-blooded animal bites should be suspect.

Risk: For countries in Tropical South America, there is a risk of rabies infection particularly in rural areas, or in areas where large numbers of dogs are found.

Prevention: Do not handle any animals! Any animal bite should receive prompt attention (**if you are bitten while on the Program, contact a Program staff member immediately**). When wounds are thoroughly cleaned with large amounts of soap and water, the risk of rabies infection

is reduced. Exposed individuals should receive prompt medical attention and advice on post-exposure preventive treatment.

Recommendations: There are no requirements for vaccination, but pre-exposure vaccination is recommended for travelers visiting, for more than 30 days, foreign areas where rabies is known to exist; veterinarians and animal handlers; spelunkers; and certain laboratory workers.

Pre-exposure vaccination does not nullify the need for post-exposure vaccine, but does reduce the number of injections. For additional information, contact CDC website; *Rabies Information*.

SUMMARY OF RECOMMENDATIONS FOR TROPICAL SOUTH AMERICA

Travelers should (1) take the appropriate country-specific malaria prevention measures (mefloquine (or equivalent) or chloroquine), (2) follow precautions to prevent insect bites, (3) pay attention to the quality of their drinking water and food, (4) have a dose of Immune Globulin (IG) or the Hepatitis A vaccine, and (5) consider booster doses of tetanus (Td). (6) Depending on the locations to be visited, planned activities, and health of the traveler, the following vaccines should be considered: Hepatitis B, Yellow Fever, Typhoid, Rabies (pre-exposure), and Cholera. Details for these recommendations are found in this document. (7) Finally, the normal "childhood" vaccines should be up-to-date: Measles, Mumps, Rubella (MMR vaccine); Diphtheria, Tetanus, Pertussis (DTP vaccine) [< 7 years of age], and Polio vaccine. Refer to *Vaccine Recommendations*, CDC website. For further information on food and water precautions refer to *Traveler's Diarrhea & Food and Water Precautions*, CDC website. Pregnant travelers or travelers with small children should check the CDC website for additional information.

FOR MORE INFORMATION

This document, and other documents it refers to, can be obtained from the Centers for Disease Control and Prevention (CDC) in Atlanta, Georgia:

Automated Information

(Voice; 24 hours, 7 days): 404-332-4559

FAX: 404-332-4565

World Wide Web

<http://www.cdc.gov/travel/>