GENERAL INFORMATION

Yellow fever is a viral disease that is transmitted to humans by mosquitoes. The major areas of risk for yellow fever are in parts of Africa (mostly west Africa, with fewer outbreaks in central and east Africa) and South America (mostly in the Orinoco, Amazon, and Araguaia river basins). Yellow fever can be fatal, but it is preventable through the use of yellow fever vaccine, which is nearly 100% effective.

PRIMARY PROTECTION MEASURES

Whether or not you receive yellow fever vaccine, you should take personal protective measures against mosquitoes. (See "Insect Precautions.") Depending on your itinerary, there may be a risk of contracting other mosquito-borne illnesses, in addition to yellow fever.

Wear an effective mosquito repellent (one containing 30-35% DEET or 20% or more picaridin) and stay in air-conditioned or well-screened rooms. If you use a repellent containing DEET on children, do so with care; there is some evidence of a potential for neurological side effects associated with overdoses.

Reduce skin exposure when outdoors by wearing socks, long pants, and long-sleeved shirts. When traveling in rural areas, bring aerosol room insecticides to kill indoor mosquitoes and a portable bed net, which you can buy at backpacking and army-navy surplus stores. Apply permethrin (mosquito repellent/insecticide) to clothing and mosquito netting.

VACCINATION

Yellow fever vaccine is a weakened live-virus vaccine that is prepared in eggs. It is nearly 100% effective in preventing yellow fever. In the U.S., immunization is available only at centers designated by state health departments.

You may need yellow fever vaccine to protect yourself from yellow fever or because proof of vaccination is required by the country to which you are traveling (in order to prevent introduction of yellow fever into that country).

ENTRY REQUIREMENTS

Entry requirements are determined by each country, and there are different types of yellow fever entry requirements. Many countries have no entry requirements, while others require proof of yellow fever vaccination for all arriving travelers. Other countries require proof of vaccination only if you came from or traveled through (including airport transit) a country that has a risk of transmission of yellow fever or that is maintained on a list and regarded as a risk area (although this latter information may be inaccurate).

For countries that require yellow fever vaccination, you need to have proof of immunization before you are allowed into the country. This information must be recorded and validated in an official form called the "International Certificate of Vaccination or Prophylaxis" (ICVP). You must receive the yellow fever immunization at least 10 days before entering the country, but not more than 10 years previously, as the certificate is valid only for 10 years.

If proof of vaccination against yellow fever is required for entry into a country and you do not have valid
documentation of vaccination on the official ICVP, you could be denied entry, quarantined, or vaccinated at the point of entry (which is not desirable, because you risk being vaccinated with contaminated needles or syringes).

Local health and customs officials in some developing countries may require proof of vaccination even when it is not needed and may try to administer yellow fever vaccine to you before allowing you to enter the country. Border officials in a small number of African countries may request a bribe for failure to produce proof of yellow fever vaccination despite the lack of an entry requirement. If you find yourself in this situation, you should make every possible protest against vaccination, because you risk being vaccinated with contaminated needles or syringes; deportation may be preferable to receiving vaccine in this manner.

In the event that you cannot receive yellow fever vaccine due to a medical reason and the vaccine is required for entry, your physician will provide you with an “exemption letter” (sometimes called a waiver letter), which is a signed, dated statement of the reasons you cannot be immunized. This letter should be written on the physician's letterhead stationery, and your physician should make a corresponding entry in your ICVP.

An exemption letter may not be accepted by some countries, and, in this case, deportation might be preferable to vaccination at the destination, if that is what is being proposed. Countries also can quarantine unvaccinated persons, even if you have a valid exemption letter.

WHO SHOULD RECEIVE THE VACCINE

Vaccine may be needed for personal protection against yellow fever or because it is required as a condition of entry into a country. The best way to know if you need the vaccine is to check with your travel medicine provider. Based on your itinerary, your travel medicine provider can review entry requirements, assess potential disease risk, and determine your need for vaccination. You should take precautions against insects whether you receive yellow fever vaccine or not; depending on the itinerary, there may be a risk of other mosquito-borne illnesses.

The following persons should be vaccinated:

- All travelers 9 months of age and older who are traveling to areas of South America or Sub-Saharan Africa that have risk of yellow fever transmission should be vaccinated. (In very rare cases, travelers as young as age 6 months may be vaccinated.)
  - Travelers to non-risk areas of countries where risk exists in some other areas of that country but who do not have fixed travel plans should also be vaccinated.
  - Long-stay travelers to any country, any part of which has risk of yellow fever, should be vaccinated.
  - If you cannot receive yellow fever vaccine due to a medical reason, you should not travel to an area that has a risk of yellow fever transmission.
- Travelers to a country which requires yellow fever vaccine for entry should be vaccinated. (See “Entry Requirements.”)
  - If you cannot receive yellow fever vaccine due to a medical reason and the only reason for vaccination was to meet an entry requirement and you do not plan to travel to a risk area of the country in question, you can be given a waiver letter by your health care provider. (See “Entry Requirements.”)

Note: These recommendations reflect a synthesis of available advice from the Centers for Disease Control (CDC), CDC’s Advisory Committee on Immunization Practices, American Academy of Pediatrics, and the World Health Organization, as well as ongoing global surveillance and the published literature; these recommendations may differ from those of individual countries' public health authorities.

WHO SHOULD NOT USE THE VACCINE

The following persons should not receive yellow fever vaccine:
- persons who have had a previous severe reaction to yellow fever vaccine or any of its components
- persons who are extremely allergic to eggs
- persons with a history of thymus disorders associated with abnormal immune functions, such as thymoma or myasthenia gravis—but not including incidental surgical removal of thymus or distant radiation therapy. (The thymus is the central gland of the lymphatic system; it is separate and different from the thyroid gland.)
- children younger than 9 months of age (except in very unusual circumstances):
  - Infants aged 6 to 8 months may be able to receive the vaccine, but only if they will be unavoidably exposed to an area of risk for yellow fever and the health care provider recommends vaccination after consultation with CDC.
  - Children less than 6 months of age should never receive this vaccine. (See "Risks and Side Effects.")
- persons with primary immunodeficiencies or malignant neoplasms, or who are post-organ transplant
- persons on immunosuppressive therapies or drugs or immunomodulatory drugs, including TNF-a inhibitors, IL-1 blocking agents, monoclonal antibodies targeting immune cells, alkylating agents, antimetabolites, high-dose corticosteroids, radiation therapy, or chemotherapy
- persons with AIDS or other symptoms of HIV infection with severe immunosuppression

The following are "precautions" to receiving yellow fever vaccine:

- pregnancy: Vaccination of pregnant women should be avoided as the safety of the vaccine during pregnancy has not been established.
  - The only circumstance under which yellow fever vaccine should be administered during pregnancy is when the journey is unavoidable and the risk of contracting the disease is very substantial.
  - If possible, postpone travel until 9 months after delivery, at which time both the mother and infant can be immunized.
  - Women should avoid getting pregnant for at least 28 days after receiving this vaccine.
- Breastfeeding: Women who are breastfeeding should not receive this vaccine except in the rare case where travel to an area of high risk is absolutely unavoidable. Yellow fever vaccine virus may be transmitted through breast milk and has caused 1 case of severe neurologic disease in a breastfed infant.
- Persons with an acute or moderate to severe illness (with or without fever) should delay vaccination until they have recovered. Low-grade fever is not usually a reason to postpone vaccination.
- People with HIV infection with moderate immune suppression and no symptoms should discuss the risks and benefits of this vaccine carefully with their health care provider.
- Persons 60 years of age and older, especially those who are being vaccinated for the first time, should discuss the risks and benefits of this vaccine with their health care provider, as they are at higher risk for adverse effects following vaccination. However, if true risk of yellow fever exists, the vaccine is strongly recommended.
- Persons with multiple sclerosis (MS) should not receive this vaccine except in very high-risk circumstances where travel is unavoidable and after thorough discussion with their health care provider.

**RISKS AND SIDE EFFECTS**

Reactions to this vaccine are generally mild and can include pain, warmth, or swelling at the injection site, mild headache, and muscle ache. Most of these reactions occur within the first 2-3 days after vaccination but can occur up to 14 days later.

Serious side effects are rare.

- Children less than 6 months of age are at risk for vaccine-related encephalitis, although this is rare.
- Other neurological reactions or viscerotrophic reactions (fever and multi-organ failure) can also occur but are very rare.
Anaphylaxis can occur, although this is rare.

- tenfold increase in the risk of relapse in persons with MS

However, travelers should be aware of potential risks and should receive yellow fever vaccine only if clearly indicated. Any person who chooses not to receive this vaccine should not travel to risk areas.

There is a rare chance that serious problems or even death could occur after receiving any medicine or vaccine. **As with any serious medical problem, if a person has a significant or unusual problem after receiving a vaccine, the person should call or be taken to a health care provider promptly.**

**TIMING**

Yellow fever vaccine is given as a single injection.

- If a country requires the vaccine for entry, the vaccine must be given at least 10 days before you enter the country. For requirement purposes, the vaccine is valid for 10 years.
- If other live-virus vaccines (such varicella) are necessary for travel, they should be given on the same day as the yellow fever vaccination, if possible; otherwise they must be given at least 30 days apart, in which case travelers might have to allow up to 4-8 weeks before travel for completion of the administration of all live-virus vaccines. Two exceptions are oral typhoid vaccine and measles vaccine, either of which can be given at the same time as yellow fever vaccine or at any time before or after yellow fever vaccine.

A booster dose is needed every 10 years for purposes of fulfilling entry requirements. For personal protection, however, studies have indicated that yellow fever immunity (after 1 dose of vaccine) can persist for 30-35 years and perhaps for life.