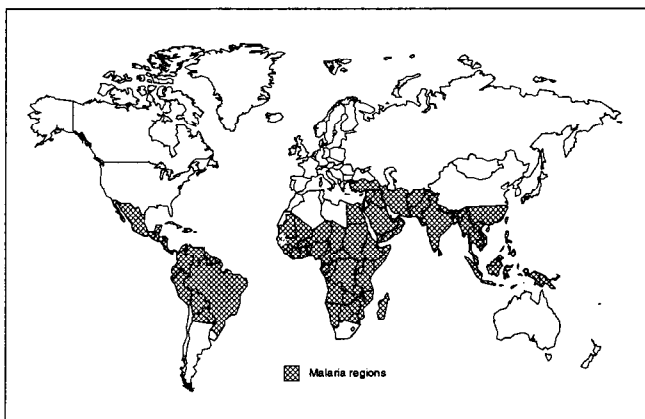


Preventing Malaria in Travelers

A guide for travelers to malarious areas

Many people acquire malaria, a potentially life-threatening disease, during travel to tropical and subtropical countries. Malaria occurs in most of sub-Saharan Africa, southern and southeast Asia, Mexico, Haiti, the Dominican Republic, Central and South America, Papua New Guinea, Vanuatu, and the Solomon Islands. Major cities in Asia and South America are nearly malaria free; cities in Africa, India, and Pakistan are not. There is generally less risk of malaria at altitudes above 1500 meters (4500 feet).

Malaria Regions of the World



Malaria and its symptoms

Malaria is a serious disease that occurs when an infected Anopheles mosquito bites a person and injects malaria parasites into the blood. Although four species of malaria parasites can infect humans and cause illness (*Plasmodium falciparum*, *P. malariae*, *P. vivax*, and *P. ovale*), only falciparum malaria is potentially life-threatening.

Symptoms of malaria are flu-like and may include fever, chills, muscle aches, headache, and, sometimes, vomiting, diarrhea, and coughing. Patients with severe falciparum malaria may develop liver and kidney failure, convulsions, and coma. Although infections with *P. vivax* and *P. ovale* may cause less serious illness, parasites may remain dormant in the liver for many months, causing a reappearance of symptoms months or even years later.

Immediate treatment of falciparum malaria is critical.

At first, symptoms may be mild. Malaria should be suspected if the traveler has fever or any of the above symptoms between 1 week after the first possible exposure to infected mosquitoes and several months after the last exposure. The period between mosquito bite and onset of illness is usually 7 to 21 days, but this interval may be longer when the traveler has taken incomplete or inadequate malaria prevention measures.

If malaria is suspected, medical help must be sought immediately. A blood sample should be taken to check for malaria parasites.

About 2% of patients infected with falciparum malaria die, usually because of delayed treatment. Immediate treatment of falciparum malaria is critical.

Protection against malaria

No vaccine against malaria is available, but travelers can protect themselves by using anti-mosquito measures and by taking drugs to prevent malaria.

Avoiding mosquito bites

Avoiding the bites of Anopheles mosquitoes (which usually bite only between dusk and dawn) is the best way to prevent infection.

To avoid mosquito bites

- Apply insect repellent to exposed skin. The recommended repellent contains 20%-35% DEET (N,N-diethyl-m-toluamide).
- Wear long-sleeved clothing and long pants if you are outdoors at night.
- Use a mosquito net over the bed if your bedroom is not air-conditioned or screened. For additional protection, treat the mosquito net with the insecticide permethrin.
- Spray an insecticide or repellent on clothing, as mosquitoes may bite through thin clothing.
- Spray permethrin or a similar insecticide in your bedroom before going to bed.

Note: Vitamin B and ultrasound devices do not prevent mosquito bites.

Using antimalarial drugs

Travelers to areas where malaria occurs should discuss their travel plans with a physician well before departure. Drugs to prevent malaria are usually prescribed for travelers to malarious areas. Travelers from different countries may receive different recommendations, reflecting differences in approach and availability of medicines in different countries. Travelers visiting only cities or rural areas where there is no risk of malaria may not require preventive drugs; an exact itinerary is necessary to decide the degree of protection required.

**Drugs recommended for prevention of
malaria in travelers**

Mefloquine, Doxycycline, Chloroquine

Strict adherence to the recommended doses and schedules of the antimalarial drug selected is necessary for effective protection.

- Take tablets on the same day each week or, in the case of tablets to be taken daily, at the same time each day.
- Take tablets after meals.
- Take the recommended doses 1 to 2 weeks before travel, throughout the trip, and for 4 weeks after leaving the malarious area.
- Don't stop taking the tablets after arriving home; it is essential to complete the full dosage.

Drug resistance

Choosing antimalarial drugs has become complicated by the appearance of drug-resistant strains of malaria. In Mexico, Central America, Haiti, the Dominican Republic, and the Middle East, the preventive drug of choice is weekly chloroquine. In all other areas of the malarious world the drug of choice is weekly mefloquine (Lariam*). If mefloquine cannot be taken, an effective alternative is daily doxycycline. If neither mefloquine nor doxycycline can be taken, chloroquine (with or without proguanil, a drug not available in the United States) is a third alternative, but this drug is much less effective in most areas. If chloroquine is used in drug-resistant areas, a suitable stand-by treatment (see "Self-treatment") should be carried in case malarial symptoms occur and medical help cannot be obtained within 24 hours.

Side effects of antimalarial drugs

All medicines have some side effects; however, if a serious side effect occurs, the traveler should seek medical help and discontinue taking the antimalarial drug. Mild nausea, occasional vomiting, or loose stools are not adequate reasons for stopping the antimalarial drug. The seriousness of malaria warrants tolerating temporary side effects.

Self-treatment

The antimalarial drug sulphadoxine-pyrimethamine (Fansidar*) can be carried for self-administration when fever and flu-like symptoms occur during travel and prompt medical attention is not available. This is a temporary measure only, and medical advice should be sought as quickly as possible. Travelers who become ill after their return home should never treat their illness themselves. Instead, they should seek prompt medical attention and inform their doctor of recent travel.

*Use of trade names is for identification only and does not imply endorsement by the Public Health Service or the U.S. Department of Health and Human Services.

Prevent Malaria

During travel to areas in which malaria is present,

- Use anti-mosquito measures
- Take a drug to prevent malaria
- Consult a physician if you get sick

The CDC provides current information about malaria and other diseases of concern to travelers by telephone (404-332-4555) and fax (404-332-4565).

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April 1995