

Have a safe trip!

Contact the Travel Clinic if you have questions
before you travel or feel unwell after you
return to Japan.

Protecting Yourself from Malaria

Pocket Guide
2022

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Are you planning to travel to somewhere affected by malaria?



! To have a safe journey:

In locations where malaria is present, other infections and events are often a real concern. Before you depart, learn about the level of public safety and health care at your destination, get the necessary vaccines, and purchase travel insurance. Make an appointment with a travel clinic if you have any concerns.

Preventing malaria requires more than just drugs. Knowing the facts, preventing bites, and promptly seeking treatment are also essential. Use this Pocket Book to keep yourself safe from malaria.

The Four Keys to Malaria Prevention

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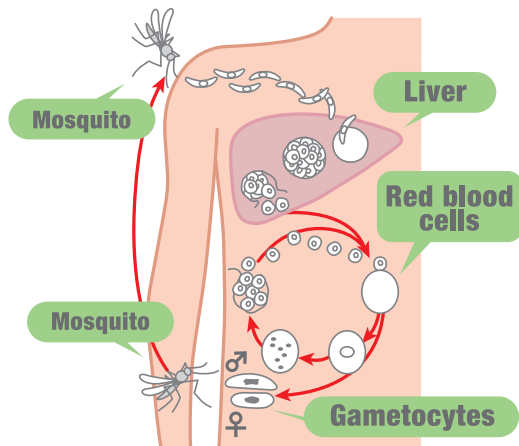
What is Malaria?

Malaria is a disease transmitted by *Anopheles mosquitoes* and caused by different *malaria parasites*.

The parasites are injected into the body when an infected mosquito feeds on the blood of a person. The parasites then travel to cells in the liver, where they multiply for 10 to 30 days. During this *incubation period*, the host is free of symptoms.

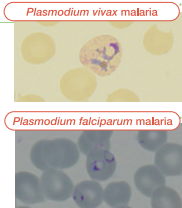
The parasites then invade circulating red blood cells, multiplying further. During this stage, the host experiences symptoms such as fever and headache. Infections caused by one species of malaria parasite (*Plasmodium falciparum*) can be fatal because the parasite multiplies unchecked in the body.

When mosquitoes bite an infected person, one stage of the parasite (called gametocytes) returns to the mosquitoes, completing the cycle. Many residents in locations with malaria have gametocytes in their blood even if they are minimally symptomatic. People cannot get malaria directly from infected people.



Types of Malaria

There are five types of malaria that are classified according to the responsible parasite (table). *Plasmodium falciparum* malaria is also known as malignant malaria. When left untreated, this serious disease can be fatal in travelers who have no immunity. The different types of malaria are indistinguishable based on early symptoms. Only experts looking at blood samples under a microscope can tell which parasite is involved.



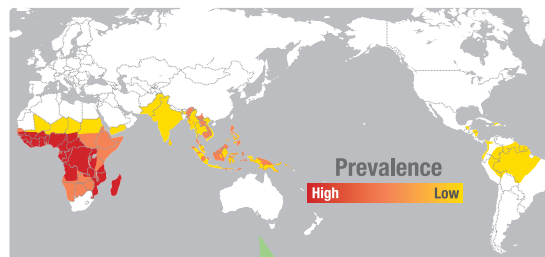
	<i>Plasmodium falciparum</i> malaria	<i>Plasmodium vivax</i> malaria	<i>Plasmodium ovale</i> malaria	<i>Plasmodium malariae</i> malaria
Early symptoms	Fever, headache			
Progression	Multi-organ failure, death	Recurrent fevers every 48 hours	Recurrent fevers every 72 hours	
Affected areas	Africa, Papua New Guinea, etc.	Indonesia, India, Brazil, etc.	Africa, etc.	
	Malignant malaria	Benign malaria		

Plasmodium knowlesi malaria is one other type of malaria.

Dormant Stage of Malaria

- Lasts 10 to 30 days. May in rare cases last more than 6 months.
- Travelers staying for 1 week or less will not have symptoms before returning home.

Areas where malaria is endemic



According to Japan's Expert Committee on Malaria Prevention, antimalarial drug treatment is absolutely indicated if:

- You will be in a **highly endemic location for 1 week or more.**
- You will be in a **location without proper care** for malaria infections.

Risk of Malaria Infection

High	> Risk of malaria infection	> Low
Rural	Setting	Urban
Long	Duration of stay	Short
Latter half of rainy season	Season	Latter half of dry season
Staying with friends/family	Type of trip	Organized tour
Low lying (near water)	Altitude	High (> 2000 meters)
Outdoors	Location of activity	Indoors
Nighttime	Time of activity	Daytime
Budget lodging with open windows	Lodging	Air-conditioned hotel

- Those staying in West Africa for a month without taking antimalarial drugs have a **3% risk of infection.**
- Those staying in tropical Africa for a month generally have a **0.2% risk of infection.**

How to Keep from Being Bitten by Mosquitoes

Anopheles mosquitoes are most active from dusk to dawn. Activity peaks around 2:00 a.m.

Stay indoors at night!

If you must go outside, wear clothing that covers your skin completely.



Carefully choose where you sleep!

Before you travel, ask your hotel if they have mosquito nets.

Mosquito coils can also help keep mosquitoes away.



What is DEET?

DEET is an insect repellent that has been used since the 1950s to repel mosquitoes, ticks, and other insects. DEET is applied to the skin and clothing. DEET products contain anywhere from 4% to 100% DEET. Products sold outside Japan generally contain 20% to 30%. Products sold in Japan contain up to 30% DEET and work for 1 to 8 hours depending on the DEET concentration. Be sure to use DEET products as directed on the label. (Particular care is required for children and pregnant women.) When used with a sunscreen, DEET should be applied on top of the sunscreen.



Be sure your bug spray contains DEET!



Sprays with a low level of DEET must be frequently applied.

Do Mosquitoes Transmit Diseases other than Malaria?

Mosquitoes also transmit dengue fever in Southeast Asia and yellow fever in Africa and South America. These diseases have symptoms similar to malaria. These diseases are transmitted by a species of mosquito called *Aedes aegypti*, not by *Anopheles* mosquitoes. Since this species is active during the day, be sure to protect yourself during the daytime as well.

Antimalarial Drugs Available in Japan

With proper use, antimalarials prevent 90% of disease onset.

Mefloquine



Information about mefloquine

Users must continue taking mefloquine for 4 weeks after leaving areas with malaria because the drug does not work on malaria parasites in the liver. Mefloquine is taken once weekly and is therefore suitable for long stays. In rare cases, the drug can cause severe psychiatric and neurological side effects. Safety data from in and outside Japan dates back to the 1970s. Mefloquine is approved for use in children and pregnant women in the United States and some other countries.

You cannot use mefloquine if:

- **You have depression**
(or have previously had depression)
- **You are being treated for epilepsy**
(or have been treated in the past)
- **You are a child** ● **You are pregnant**

Side effects of mefloquine

- **Dizziness is the most common side effect.**
(One in 10 people are affected.)
- **The drug may also cause diarrhea, nausea, and other gastrointestinal symptoms.**
(One in 25 to 30 people are affected.)
- **Rarely, insomnia, depression, convulsions, and other psychiatric and neurological symptoms occur.**

These side effects occur after several doses have been taken. Side effects rarely require the drug to be discontinued.

Malarone®



Information about Malarone

This combination product contains the 2 drugs atovaquone and proguanil.

Users can stop taking it sooner after leaving an area with malaria than other drugs because it works on malaria parasites in the blood and liver.

It must be taken every day and is therefore suitable for short stays. Extensive long-term safety data is not yet available because Malarone was marketed only fairly recently.

You cannot use Malarone if:

- **You are pregnant**

Side effects of Malarone

- **The drug may cause diarrhea, abdominal pain, and other gastrointestinal symptoms.**
(One in 10 to 20 people are affected.)
- **Rarely, nightmares and other psychiatric and neurological symptoms occur.**


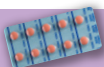
Malarone tends to cause fewer side effects than mefloquine. The frequency of side effects overall was about 70% and the frequency of gastrointestinal and psychiatric/neurological side effects was about half the frequencies associated with mefloquine.

Doxycycline

This drug is not approved in Japan for the treatment or prevention of malaria.



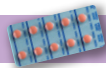
Comparison of Antimalarial Drugs

	Mefloquine 	Malarone® 	Doxycycline
Approval status in Japan	Approved	Approved	Not approved
Long stays	Very suitable for long stays	Somewhat suitable for long stays	Somewhat
Short stays	Suitable for short stays	Very suitable for short stays	Suitable
Dose adjustment	The dose must be adjusted for people who weigh less than 45 kg	The dose must be adjusted for people who weigh 40 kg or less	The dose must be adjusted for people who weigh 45 kg or less
Contraindications	Current or previous depression Current or previous epilepsy	Severe kidney damage	
Use in pregnancy	No (ask the Travel Clinic)	No	No
Use and dosage in children	No (ask the Travel Clinic)	<ul style="list-style-type: none"> ● 11 to 20 kg: 1 pediatric tablet ● 21 to 30 kg: 2 pediatric tablets ● 31 to 40 kg: 3 pediatric tablets ● > 40 kg: Same as adult dosage 	No
Price in Japan (as of 2022)	About 784.4 yen per tablet ● About 6,300 yen for a 2-week trip (8 tablets)	About 507.3 yen per tablet About 246.8 yen per pediatric tablet ● About 11,200 yen for an adult on a 2-week trip (22 tablets)	About 22 yen (1 tablet)



Comparison of Antimalarial Drugs

Malarone®

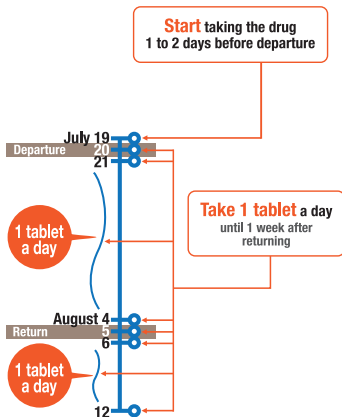


22 day (22 tablet) course

Dosage for Adults

For example:

Figures on the right show dosages for someone planning to travel to Ghana in West Africa for about 2 weeks from July 20 to August 5



● Dosage of Malarone Pediatric Combination Tablets (1 dose a day for malaria prevention)

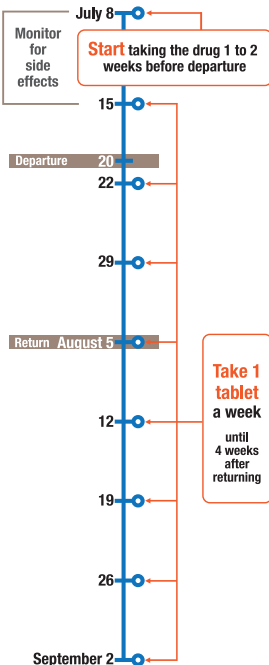
Weight	Malarone Pediatric Combination Tablets
11 to 20 kg	1 tablet
21 to 30 kg	2 tablets
31 to 40 kg	3 tablets
> 40 kg	4 tablets

Mefloquine



8 week (9 tablet) course

Note: Take 3/4 of a tablet if you weigh 30 to 45 kg



Doxycycline

Off-label use

44 day (44 tablet) course



Malaria: Symptoms and Treatment

- There are no specific symptoms other than high fever ($\geq 39^{\circ}\text{C}$) and headache.
- A blood test is required for definitive diagnosis.
- Multi-organ failure and other severe outcomes are rare if proper treatment is started within 3 days of disease onset.

Symptoms Suggestive of Malaria

- Sudden high fever ($\geq 39^{\circ}\text{C}$) and chills
- Headache
- Muscle aches
- Nausea, diarrhea, cough (rare)
- Jaundice, impaired consciousness, no urine production, difficulty breathing (appearing 3 to 5 days after onset of severe *Plasmodium falciparum* malaria)

Another Disease may be Causing Your Symptoms

Many diseases have symptoms similar to those of malaria. Examples are dengue fever, influenza, typhoid fever, paratyphoid fever, leptospirosis, rickettsiosis, acute hepatitis A, and viral hemorrhagic fevers. Other unexplained diseases resolve on their own in a few days. Normally, a blood test is required to properly diagnose these diseases and determine their severity.



How to Get the Best Care

1 Seek care as soon as possible.

Those with malaria may experience a sudden fever of 39°C or higher. Seek medical care soon if you have a sudden fever or similar symptoms. Starting quickly will simplify the treatment process.

2 Tell your doctor that you have traveled abroad.

People do not get malaria in Japan. This means that your doctor will not suspect malaria unless you tell them you've been to an endemic country. In Japan, malaria can be mistaken for influenza, especially during the flu season.

3 Summarize what you did during your trip.

Telling the doctor when you arrived at and departed from your destination will help them guess the incubation period. Try to remember how you traveled (e.g., backpacking, group tour) and what you did in as much detail as possible. Also inform your doctor exactly where you traveled, telling them not only the country but also the city. Any information you have about contact with animals will greatly help the doctor make a diagnosis. Write this information on paper before you see the doctor so it will be easy to convey.

4 Take literature about the vaccines you've gotten and treatment you're receiving.

If you have previously become ill and received treatment when traveling, take relevant referral letters, medical records, drug packages, receipts, and other information with you. If you are currently seeing a doctor, also bring information about the treatment you're receiving.

5 Call the hospital before you visit.

Not all hospitals are able to test for malaria. Even those that are able might not offer testing during the night or on holidays. Your hospital might refer you to another medical institution for proper care.

6 Remember to take your Japanese health insurance card.

Be sure to bring your Japanese health insurance card and travel insurance certificate.

What is Yellow Fever?

Yellow fever is a viral disease transmitted primarily by a mosquito species called *Aedes aegypti*. The initial symptoms of fever and headache are followed by yellowing of the skin throughout the body (jaundice) as the disease weakens the liver. With no effective medications available, yellow fever has a death rate of around 30%.



Yellow Fever Vaccine

The 2005 edition of the International Health Regulations (IHR 2005) requires travelers to certain areas to be vaccinated so as to prevent the spread of yellow fever to other areas. A yellow fever vaccination certificate (yellow card) issued as proof of vaccination may be requested on departure or arrival.

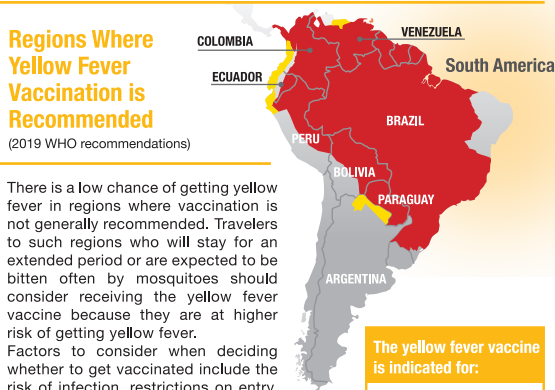
In Japan, the vaccine is available only at quarantine stations and certain medical institutions. The yellow fever vaccine is generally safe but in very rare cases causes encephalitis, organ failure, and other serious side effects.

Be sure to talk with your doctor if you have any of the conditions listed below. If your doctor decides that you should not be vaccinated, you will receive an English waiver instead of a yellow card.

- You have a disease that weakens immunity.
- You take a drug that weakens immunity (e.g., oral steroids).
- You are allergic to eggs.
- You are at least 60 years of age.
- You are an infant.
- You are pregnant or breastfeeding.

Regions Where Yellow Fever Vaccination is Recommended

(2019 WHO recommendations)

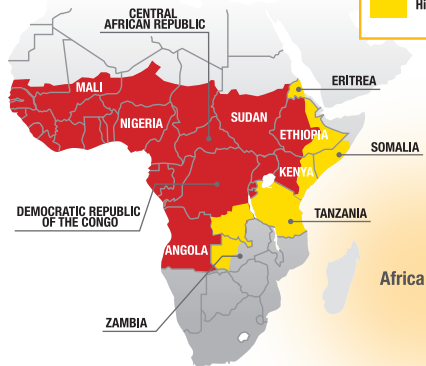


There is a low chance of getting yellow fever in regions where vaccination is not generally recommended. Travelers to such regions who will stay for an extended period or are expected to be bitten often by mosquitoes should consider receiving the yellow fever vaccine because they are at higher risk of getting yellow fever.

Factors to consider when deciding whether to get vaccinated include the risk of infection, restrictions on entry, and the personal risk factors of the traveler.

The yellow fever vaccine is indicated for:

- Travel to a vaccine-recommended region
- High-risk individuals



Viral Hemorrhagic Fevers

Although less common than malaria, viral hemorrhagic fevers can affect travelers. These diseases are caused by a variety of viruses. Initial symptoms, such as fever and headache, resemble those of malaria. Those with a viral hemorrhagic fever often die from bleeding and multi-organ failure within a week. Viral hemorrhagic fevers are included in the Japanese Ministry of Health, Labour, and Welfare's list of Category I Infectious Diseases because the viruses that cause them are passed via the blood and other bodily fluids (see table). Japanese law authorizes prefectural governors to demand hospitalization of those who have an actual or suspected Category I Infectious Disease.

Recent cases of Ebola disease, Lassa fever, and Marburg disease have been reported in European and American travelers. Lassa fever appears to have been transmitted by mice, and Marburg disease is thought to have been transmitted by cave-dwelling bats.

Natal multimammate mouse



This rodent is about 10 cm long. Many natal multimammate mice in West Africa (e.g., Nigeria, Sierra Leone) carry the virus that causes Lassa fever. People can become infected when they touch or inhale secretions that contain the virus. The disease is prevalent during the dry season (December to March). A German traveler died from Lassa fever in 2016.

American and Dutch travelers contracted Marburg disease in 2008. Both had visited the same cave in Uganda. The two appear to have become infected from bats in the cave. Bats that carry the virus are thought to live in other caves in Africa.

Category I Infectious Diseases

Ebola disease
Marburg disease
Crimean-Congo hemorrhagic fever
Lassa fever
South American hemorrhagic fevers
Plague
Smallpox

A cave in Uganda

This cave is in Queen Elizabeth National Park



(Photograph from CDC website)



**FORTH website of Quarantine Information Office,
Ministry of Health, Labour, and Welfare** [Japanese only]

<https://www.forth.go.jp>

Overseas safety website of Ministry of Foreign Affairs [Japanese only]

<https://www.anzen.mofa.go.jp>

Worldwide health care information website of Ministry of Foreign Affairs [Japanese only]

<https://www.mofa.go.jp/mofaj/toko/medi>

Fit For Travel website of NHS Scotland [English website]

<https://www.fitfortravel.nhs.uk>

Travelers' Health website of U.S. CDC [English website]

<https://www.wnc.cdc.gov/travel/>

International Travel and Health online publication of WHO
[in English and Spanish]

<https://www.who.int/publications/i/item/9789241580472>

Learn the latest facts at these sites before you visit the Travel Clinic.