

BACKGROUND

Malaria is a serious and sometimes fatal disease caused by a parasite that commonly infects a certain type of mosquito which feeds on humans. Five kinds of malaria parasites can infect humans: *Plasmodium falciparum*, *P. vivax*, *P. ovale*, *P. malariae*, and *P. knowlesi*. Recently, it has been recognized that *P. knowlesi*, a type of malaria that naturally infects macaques (a genus of monkey) in Southeast Asia, also infects humans, causing malaria that is transmitted from animal to human, “zoonotic malaria.”

Worldwide, more than 240 million cases of malaria occur each year. According to the World Health Organization (WHO), half of the world’s population is at risk of malaria. In 2021, an estimated 247 million malaria cases and 619,000 malaria deaths were reported. In 2021, 96% of the deaths from malaria occurred in the WHO Africa Region, and children under 5 years of age accounted for 80% of these deaths.

Almost all cases of malaria in the U.S. are imported and occur in people traveling from countries with malaria transmission, many from sub-Saharan Africa and South Asia. Before the COVID-19 pandemic, approximately 2,000 cases of mostly travel-related malaria were diagnosed in the U.S. each year; approximately 300 people experienced severe disease (most *P. falciparum*), and 5 to 10 people with malaria died yearly. Most imported cases of malaria in the U.S. are diagnosed during summer and early fall.

WHO DOES THE ISSUE IMPACT?

Anyone can get malaria. Most cases occur in people who live in countries with malaria transmission. People from countries with no malaria can become infected when they travel to countries with malaria or through a blood transfusion (although this is very rare). Also, an infected mother can transmit malaria to her infant before or during delivery.

Locally acquired mosquito-borne malaria cases occurred in the United States in 2023 in Florida, Texas, and Maryland. Prior to 2023, the last locally reported malaria cases were in 2003 when eight cases of locally acquired *P. vivax* malaria were identified in Palm Beach County, FL. Despite these cases, the risk of locally acquired malaria remains extremely low in the United States. However, *Anopheles* mosquito vectors, found throughout many regions of the country, including Pennsylvania, are capable of transmitting malaria if they feed on a malaria-infected person. The risk is higher in areas where local climatic conditions allow the *Anopheles* mosquito to survive during most of or the entire year or among people who travel to locations where malaria is endemic.

COMPLICATIONS

People who have little or no immunity to malaria, such as young children and pregnant women or travelers coming from areas with no malaria, are more likely to become very sick and possibly die from a malaria infection. Malaria during pregnancy is associated with high risks of both maternal and perinatal morbidity and mortality. *P. Falciparum* and *P. knowlesi* infections can cause rapidly progressive severe illness or death, while the other species, including *P. vivax*, are less likely to cause severe disease.

SIGNS AND SYMPTOMS

- Symptoms of malaria include:
 - ❖ Fevers and flu-like illness including shaking chills, headache, muscle aches and tiredness.
 - ❖ Nausea, vomiting and diarrhea.

- ❖ Anemia and jaundice (yellow coloring of the skin and eyes) due to the loss of red blood cells.
- For most people, symptoms begin 7 to 30 days after infection from a mosquito bite, although a person may feel ill as early as 7 days or as late as 1 year later. If not treated promptly, malaria may progress to severe disease, a life-threatening stage in which mental status changes, seizures, renal failure, acute respiratory distress syndrome, and coma may occur.
- Infection with one type of malaria, *Plasmodium falciparum*, if not promptly treated may cause kidney failure, seizures, mental confusion, coma, and death.
- Two kinds of malaria, *P. vivax* and *P. ovale*, can relapse. In *P. vivax* and *P. ovale* infections, some parasites can remain dormant in the liver for several months up to about 4 years after a person is bitten by an infected mosquito. When these parasites come out of the dormant phase and begin invading red blood cells (“relapse”), the person will become sick.

CAUSES AND TRANSMISSION

Usually, people get malaria by being bitten by an infected female *Anopheles* mosquito. Only *Anopheles* mosquitoes can transmit malaria, and they must have been infected through a previous blood meal taken from an infected person. When a mosquito bites an infected person, a small amount of blood is taken which contains microscopic malaria parasites. About 1 week later, when the mosquito takes its next blood meal, these parasites mix with the mosquito's saliva and are injected into the person being bitten. Because the malaria parasite is found in red blood cells of an infected person, malaria can also be transmitted through blood transfusion, organ transplant, or the shared use of needles or syringes contaminated with blood. Malaria may also be transmitted from a mother to her unborn infant before or during delivery (“congenital” malaria).

TESTS AND DIAGNOSIS

For people who develop symptoms, their healthcare provider can order microscopic examination, rapid diagnostic tests (RTD), or other tests to diagnose malaria. Malaria is a potential medical emergency and should be treated accordingly. People who are suspected of having malaria should be urgently evaluated in a facility that is able to provide rapid diagnosis and treatment, within 24 hours of presentation.

TREATMENTS

Malaria should be treated early in its course before it becomes severe and poses a risk to the patient's life. Several effective anti-malarial drugs are available and should be administered early. The most important step is to think about malaria (provide your travel history), so that the disease is diagnosed and treated in a timely manner. Since different *Plasmodium* species require different types of treatment, it is very important to know the infecting species and to seek care from a health care provider knowledgeable about malaria treatment.

WHAT CAN YOU DO?

If you will be traveling outside the United States:

- Obtain a detailed itinerary including all possible destinations that may be encountered during the trip and check to see if malaria transmission occurs in these locations.
- Visit your health care provider 4-6 weeks before foreign travel for any necessary vaccinations, as well as a prescription for an antimalarial drug, if needed.
- If prescribed, take your antimalarial drug exactly on schedule without missing doses.
- Sleep under a mosquito bed net (preferably one that has been treated with insecticide).

- Purchase all the medications that you need before you leave the United States. As a precaution, note the name of the medication(s) and the name of the manufacturer(s). That way, in case of accidental loss, you can replace the drug(s) abroad at a reliable vendor.

To prevent malaria and mosquito bites:

- Use EPA approved insect repellent.
- Wear long-sleeved shirts and long pants to cover your skin from mosquito bites.
- Treat your clothing and gear with an insecticide.
- Prevent mosquito bites when traveling: Sleep under a mosquito net if you are outside or when screened rooms are not available (DO NOT sleep directly against the net, as mosquitoes can still bite through holes in the net).
- Take steps to control mosquitoes indoors and outdoors:
 - Maintain good screens on windows and doors to keep infected mosquitoes out.
 - Regularly empty any outside containers or drilling drainage holes in their bottoms.
 - Turn over plastic wading pools and wheelbarrows when not in use.
 - Clean clogged roof gutters that may allow the pooling of rainwater.
 - Do not allow water to stagnate in bird baths or ornamental ponds.
 - Clean and chlorinate swimming pools and remove standing water from pool covers.
 - Use landscaping to eliminate standing water that routinely collects on your property.
 - Remove discarded tires from your property as they provide habitat for larva when they fill with water.
 - Use *Bacillus thuringiensis israelensis* (Bti) tablets for standing water that can't be eliminated. These tablets are available at any lawn and garden store and will kill any mosquito larvae present, but the water will remain safe for people, pets, aquatic life, and plants.

If you or a family member might have malaria

- Contact your health care provider immediately

RESOURCES FOR MORE INFORMATION

PA DOH Vectorborne Disease webpage: [Vectorborne Diseases](#)

CDC Malaria website: [CDC - Parasites - Malaria](#)

PA 2023 Health Alert: [2023-707-6-28-ADV-Malaria.pdf \(pa.gov\)](#)

This fact sheet provides general information. Please contact your physician for specific clinical information.

If you have any questions, contact us at 1-877-PA-HEALTH.