

Malaria in Post-Earthquake Haiti: CDC's Recommendations for Prevention and Treatment

Malaria is found in all areas of Haiti at a relatively low prevalence. The predominant malaria species being transmitted, *Plasmodium falciparum*, can lead to severe disease. Symptoms of malaria are nonspecific and can include fever, chills, headache, nausea, and vomiting. There are several drug options for the prevention and treatment of malaria, including chloroquine (CQ). There is no evidence of prophylactic or treatment failures with CQ in Haiti. One study¹ found 6% of *P. falciparum* isolates collected in the Artibonite Valley in Haiti in 2006 and 2007 carried a mutation known to confer parasite resistance to CQ. The study authors noted that these findings do not serve as a basis for broad prophylaxis and treatment policy change, but do point out the need for heightened awareness of potential failure of CQ in persons in or returning from Haiti. CDC is monitoring the malaria situation in Haiti and will update recommendations as needed. For more information on malaria go to www.cdc.gov/malaria or e-mail malaria@cdc.gov.

Malaria Prevention (for relief workers and staff deployed to Haiti)

Take medications to prevent malaria. Recommended drugs (and dosing):

Atovaquone-proguanil	1 pill daily, 1-2 days before departure, while there, and 7 days after return
Chloroquine	300mg base or 500mg salt weekly, 1 wk before departure, while there, and 4 wks after return
Doxycycline	100mg daily, 1-2 days before departure, while there, and 28 days after return
Mefloquine	228mg base or 250mg salt weekly, 2 wks before departure, while there, and 4 wks after return

If starting medications <1 week before departure or while already in Haiti, use atovaquone-proguanil or doxycycline. **Avoid mosquitoes.** Use insect repellent containing 10-50% of DEET, picaridin (KBR 3023), oil of lemon eucalyptus/PMD, or IR3535 on exposed skin. Wear long-sleeved shirts and pants, treat clothing and tents with permethrin, sleep under an insecticide-treated bed net, and use insecticide to clear your sleeping area of mosquitoes.

Malaria Diagnosis and Treatment

Identify resources for malaria diagnosis and treatment. All persons with suspected malaria should seek immediate medical attention, receive a diagnostic test (malaria smear or rapid diagnostic test) for malaria, and may require referral to a nearby clinic, hospital, or field medical site. If timely diagnosis is not available, treat presumptively.

For relief workers and staff deployed to Haiti who develop symptoms of malaria, follow U.S. guidelines:

- Uncomplicated malaria: For malaria in those adherent to prophylaxis, use an alternate drug.

Chloroquine	600mg base (1000mg salt) immediately, then 300mg base (500mg salt) at 6, 24, and 48 hrs
Artemether-lumefantrine	4 tablets per dose, first dose immediately, second dose at 8 hrs, then 1 dose twice/day for 2 days
Atovaquone-proguanil	4 adult tablets daily for 3 days
Quinine AND one of the following: doxycycline, tetracycline, clindamycin	Quinine (542mg base or 650 mg salt three times a day for three days); doxycycline (100mg twice a day for 7 days), tetracycline (250 mg four times a day for 7 days), or clindamycin (20mg/kg/day divided into three doses a day for 7 days)

- If treating with CQ, consider quickly switching to other recommended drugs for uncomplicated malaria if evidence of poor response to treatment (e.g., increasing parasite density 24 hours after start of treatment, persistent parasitemia 48 hours after start of treatment, or clinical deterioration).
- Severe malaria: Initiate treatment, consider immediate medical evacuation, and call CDC's Emergency Operations Center (770) 488-7100 to speak with a malaria clinician. First-line treatment of severe malaria in the U.S. is intravenous quinidine and one of the following: doxycycline, tetracycline, or clindamycin. This treatment requires an intensive care unit setting. If immediate treatment is needed in the field, treat with any of the recommended antimalarials before transfer to more definitive care.

For residents of Haiti who develop symptoms of malaria, follow Haiti's national guidelines:

- Uncomplicated malaria: CQ (see treatment dose above) and one dose of primaquine (0.75 mg/kg). (If primaquine, used primarily to prevent malaria transmission, is not available, CQ can be given alone.)
- Severe malaria: Intravenous quinine infusion (loading dose 20mg/kg, then 10mg/kg every 8 hrs at an infusion rate not to exceed 5mg/kg/hr). Follow with a full treatment course of CQ when oral medications are tolerated.

1. Londono BL, Eisele TP, Keating J, Bennett A, Chattopadhyay C, Heyliger G, Mack B, Rawson I, Vely JF, Désinor O, Krogstad DJ. Chloroquine-resistant haplotype *Plasmodium falciparum* parasites, Haiti. Emerg Infect Dis. 2009;15:735-40.