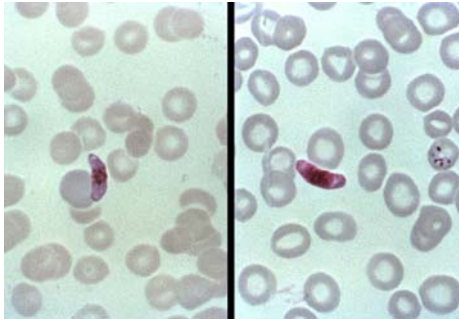


Malaria: A Global Story

Malaria is caused by single-cell parasites of genus *Plasmodium* (*P.*). Four types of *P.* parasites infect humans: *Plasmodium falciparum*, *vivax*, *ovale* and *malariae*. Among these, *P. falciparum*



is the most common and most deadly. Malaria parasites develop through various stages of the life cycle in two hosts—female Anopheles mosquitoes and humans. In humans, the parasite causes various symptoms such as fever, chills, sweats, headaches, body aches, nausea and vomiting, etc., while infecting red blood cells. The parasite's life cycle is complex and multi-layered, and that has presented many challenges in eliminating the disease. Each year an estimated 500 million people suffer from malaria worldwide, and over one million people die from it.

(Above: Sex cells of *Pl. falciparum* developing in red blood cells, Courtesy CDC Public Health Images Library/ Steven Glenn, Laboratory & Consultation Division)

Mosquitoes can breed quickly in a small amount of standing water in warm weather. Malaria-carrying mosquitoes had been a significant problem in the United States, particularly in the southern states and Washington, DC. The first U.S. President, George Washington,



developed malaria when he was 17 years old. He experienced several relapses later in life. President James Monroe was one of several other White House residents to contract the disease. President Monroe caught malaria while visiting swampland along the Mississippi River in 1785. Draining mosquito breeding grounds and the use of the insecticide Dichloro-Diphenyl-Trichloroethane (DDT) helped rid the United States of malaria by the mid-20th century.

(Left: A photo of a canal near the construction of the Capitol building, Washington, DC, 1860, Courtesy National Archives and Records Administration.)

The Centro de Investigação em Saude de Manhica (the Manhica Health Research Centre) is located in southern Mozambique in southeastern Africa. The Centre has been testing a possible vaccine for malaria. The disease is present in all areas of the country, and more than half of children's hospital admissions are due to severe bouts of the disease.



Scientists around the world are studying the development cycle of the parasite as part of a worldwide effort to develop effective vaccines against the disease. Dr. Sungano Mharakurwa, scientific director of the Medical/Malaria Institute at Macha, Zambia in southern Africa, has played an important role in the international effort to map the genetic structure of malaria parasites. He led a team of field workers who trapped mosquitoes and studied the malaria parasites they host. With a team of scientists at the Johns Hopkins Bloomberg School of Public Health in Baltimore, Maryland, Dr. Mharakurwa helped develop a new test for detecting the malaria parasite in urine and saliva in 2006. This test is easier to perform than the standard blood test, which can only be performed by trained

health workers. This test also eliminates the problem of having to safely dispose of needles to prevent the transmission of infectious diseases. The test is also more amenable to young children, who are at risk for malaria.

(Above: Dr. Sungano Mharakurwa, Zambia, Courtesy Sungano Mharakurwa, Ph.D.)