

MALARIA

Malaria is a major cause of sickness and death worldwide, resulting in 500 million infections and at least 1 million deaths each year. Over 40% of the world's population lives in areas where they are at risk of contracting malaria. Caused by parasites called *Plasmodium* that are transmitted to humans via mosquito bites, malaria can render an individual extremely ill and, in some cases, may prove to be fatal. Symptoms of infection may include fever, chills, headache, muscle pain, fatigue, nausea and vomiting and usually appear between 10 to 15 days after a person is bitten by an infected mosquito.

Although the disease occurs in many parts of the world, it poses the greatest problem in sub-Saharan Africa, where approximately 90% of malarial deaths occur each year, mostly in children under five years of age. This region of the world is particularly hard-hit by malaria due to several factors: sub-Saharan Africa is home to a species of mosquito that can transmit the malaria parasite very efficiently; most of the region's cases are caused by the *Plasmodium falciparum* parasite, which causes the most severe and life-threatening form of disease; poverty and limited health infrastructure make the mounting of effective prevention and treatment efforts difficult; and drug-resistant strains of the parasite have also emerged in the region, acting as another barrier to malaria control.

In sub-Saharan Africa, the situation is also worsened by the presence of other diseases, especially HIV/AIDS. Both HIV/AIDS and malaria affect similar geographic areas and risk groups, causing dual public health crises. Increasing knowledge regarding the interactions between HIV/AIDS and malaria suggests that HIV-positive individuals may be more susceptible to malaria illness because of their weakened immune systems and may be less likely to respond to standard treatments for malaria. As well, there is evidence to suggest that severe malarial episodes can temporarily lead to an upsurge in HIV viral load, thereby leading to increased morbidity in individuals co-infected with HIV and malaria.

Certain populations are more vulnerable to malaria, particularly pregnant women and children. Women's immune systems are weaker during pregnancy, placing them at increased risk for contracting disease. Malaria during pregnancy is very serious and can lead to severe anemia, malarial infection of the placenta, and, in some cases, maternal death. Children born to women co-infected with malaria and HIV are much more likely to face complications such as having low birth-weight and often die during infancy. Children under five years of age are also at high risk of suffering from malaria-related illness and death because they have not had a chance to build up sufficient immunity to the disease. According to the World Health Organization (WHO), in Africa one in every five child deaths is due to the effects of malaria, with one child dying approximately every 30 seconds. Those who recover from the disease may still suffer from serious conditions as a result of the infection, such as anemia, recurrent fever, blindness and brain damage.

Although causing much morbidity and mortality around the world, illness and death from malaria are largely preventable. Control of mosquitoes is the main way in which malaria transmission can be prevented. During the 1950s and 1960s, the WHO led a global effort to eradicate the mosquitoes that carry malaria. DDT (dichlorodiphenyltrichloroethane) was the main insecticide used during this time. Through the WHO's efforts, malaria was successfully eradicated from North America and Europe. Eventually, outdoor use of DDT for malaria control was discouraged by the WHO because of the insecticide's harmful effects on the environment. Currently, the WHO recommends use of DDT for malaria control through indoor spraying. The WHO also recommends the use of insecticide-treated bed nets. These nets have been shown to significantly reduce death and illness from malaria in endemic regions and are a very important malaria control strategy. Recently, a new kind of long-lasting insecticidal net has been developed which can retain the insecticidal activity of the net for several years without needing to be re-treated.

Medications for prevention and treatment of malaria are also available. A number of anti-malarial drugs exist and are currently in use, including chloroquine, sulfadoxine-pyrimethamine (SP) and amodiaquine. They are known as monotherapies because each medication is generally used alone. Unfortunately, malaria parasites are developing

resistance to many of the available monotherapies. This is true in many parts of Asia and South America, and is a growing problem in Africa as well. Due to concerns over drug-resistance, the WHO now recommends that countries make available combination therapies, which combine two or more medications and are harder for parasites to develop resistance. As a result, since 2001, many countries have changed their treatment policy and have begun endorsing combination treatment in place of monotherapies. However, combination therapy is still not available in many countries where existing drugs are ineffective. The WHO, together with other international organizations is working to support initiatives to expand access to effective combination therapies. In 2004, the WHO revised its malaria treatment recommendation to include artemisinin-based combination therapy (ACT). The compound, found naturally in a Chinese herb, has been used to treat malaria since the 1980s and is currently the most effective measure against the disease.

In 1998, the Roll Back Malaria (RBM) Partnership was created by the WHO, United Nations Children's Fund, United Nations Development Programme and the World Bank. The Partnership aims to coordinate international malaria-control activities by bringing together over 90 public and private organizations, international agencies, malaria-endemic countries and research and academic institutions. The goal of the Partnership is to cut the global burden of malaria in half by 2010. RBM has successfully raised awareness of the disease, mobilized social, political and financial support and coordinated international efforts to combat malaria.

The Global Fund to Fight AIDS, Tuberculosis and Malaria, an independent grant-making organization, is a significant source of funding for malaria-control interventions. Since its establishment in 2002, the Global Fund has become the largest financier of insecticide-treated bed nets and has committed to delivering hundreds of millions of ACT dosages to help reduce the impact of drug-resistant malaria. In 2005, U.S. President George W. Bush announced the creation of a new Presidential Malaria Initiative (PMI) and pledged to increase funding for malaria prevention and treatment by more than US\$1.2 billion over five years and reduce deaths due to malaria by 50% in 15 countries. The Bill & Melinda Gates Foundation, a private, philanthropic organization, also has established major global malaria initiatives, supporting the development of safe, effective, and affordable malaria vaccines, malaria control efforts, the search for new malaria treatments, and expanded access to existing malaria control tools and to new drugs and vaccines.

ADDITIONAL RESOURCES

Kaiser Family Foundation. *Global Health Reporting* website *Malaria FAQs*, <http://www.globalhealthreporting.org/malaria.asp?id=63>

U.S. Department of Health and Human Services (DHHS) Centers for Disease Control and Prevention. *Malaria Facts* (2007), <http://www.cdc.gov/malaria/facts.htm>

Roll Back Malaria. *Brochure: Looking Forward* (2006), http://rbm.who.int/docs/rbm_brochure.pdf

World Health Organization. *Children and Malaria* (2006), http://www.rbm.who.int/cmc_upload/0/000/015/367/RBMInfosheet_6.htm

World Health Organization. *Facts on ACTs* (2006), http://www.rbm.who.int/cmc_upload/0/000/015/364/RBMInfosheet_9.htm

World Health Organization. *What is Malaria* (2006), http://www.rbm.who.int/cmc_upload/0/000/015/372/RBMInfosheet_1.htm

World Health Organization. *Malaria* (May 2007), <http://www.who.int/mediacentre/factsheets/fs094/en/index.html>

The Global Fund to Fight AIDS, Tuberculosis and Malaria. <http://www.theglobalfund.org/en/about/malaria/default.asp>

Bill & Melinda Gates Foundation. http://www.gatesfoundation.org/GlobalHealth/Pri_Diseases/Malaria/default.htm

President's Malaria Initiative (PMI). <http://www.fightingmalaria.gov/>