



Global Malaria Overview

President's Malaria Initiative (PMI)

<http://www.fightingmalaria.gov/index.html>

The President's Malaria Initiative is a historic 1.2 billion, five year plan announced by President Bush in 2005 to reduce deaths due to malaria in African countries. PMI is a collaborative U.S Government effort lead by the U.S Agency for International Development (USAID), the Department of Health and Human Services (HHS), the U.S Centers for Disease Control and Prevention (CDC), Department of State, the White House, and others.

The goal of the PMI is to assist national malaria control programs to cut malaria-related deaths by 50 percent in fifteen African target countries. This goal will be achieved by reaching 85 percent of the most vulnerable groups -- children under five years of age and pregnant women -- with proven and effective prevention and treatment control measures. PMI uses a comprehensive approach to prevent and treat malaria supporting four key areas: indoor spraying of homes with insecticides, insecticide-treated mosquito nets, lifesaving anti-malarial drugs, and treatment to prevent malaria in pregnant women.

Roll Back Malaria Partnership

<http://www.rollbackmalaria.org/>

Malaria is a complex and deadly disease that puts approximately 3.3 billion people at risk in 109 countries and territories around the world. Between 350 and 500 million cases of malaria occur annually, and at least one million deaths world-wide, yet malaria can be prevented, diagnosed and treated with a combination of available tools.

To provide a coordinated global approach to fighting malaria, the Roll Back Malaria (RBM) Partnership was launched in 1998 by the World Health Organization (WHO), the United Nations Children's Fund (UNICEF), the United Nations Development Programme (UNDP) and the World Bank. The RBM Partnership has expanded exponentially since its launch and is now made up of a wide range of partners - including malaria-endemic countries, their bilateral and multilateral development partners, the private sector, nongovernmental and community-based organizations, foundations, and research and academic institutions - who bring a formidable assembly of expertise, infrastructure and funds into the fight against the disease.

In September 2008, RBM partners launched the Global Malaria Action Plan (GMAP), the first-ever blueprint for global malaria control and an agreement among all partners around the goals, strategy, and activities that the RBM Partnership will pursue. The plan will maximize the impact of the malaria community's work by guiding the prioritization of resources and by strengthening the alignment across and effectiveness of various initiatives. The GMAP may influence the activities of partners and countries by supporting the definition of normative policy, the creation of country plans, and the development of implementation plans of individual partners.

Global Fund

<http://www.theglobalfund.org/en/>

The Global Fund to Fight AIDS, Tuberculosis (TB) and Malaria is a partnership between governments, civil society, the private sector and affected communities. It is dedicated to increase funding for the world's most devastating diseases including AIDS, TB and malaria. Its purpose is to attract, manage and disburse resources to fight AIDS, TB and malaria. The Global Fund represents an innovative approach to international health financing. It rapidly became the main financial engine behind the scale-up of artemisinin-based combination therapies (ACT) treatment for malaria.



The Global Fund provides two-thirds of all international financing to combat malaria. To date, the Global Fund has approved grants with a total value of US\$2.6 billion over five years to 117 programs in 85 countries to support aggressive interventions against malaria. So far, the fund disbursed US\$833 million. The Global Fund has helped to finance 120 million bed nets to protect families from transmission of malaria, thus becoming the largest financier of insecticide-treated bed nets in the world. The fund also delivered 264 million artemisinin-based combination drug treatments for resistant malaria.

CDC

<http://www.cdc.gov/>

When CDC was established in 1946, it evolved from the wartime infectious disease agency Malaria Control in War Areas (MCWA). More than 60 years later, CDC continues to support the prevention and control of malaria throughout the world in partnership with local, state, and federal agencies in the U.S., medical and public health professionals, national and international organizations, and foreign governments. The malaria program at CDC conducts both international and domestic activities, as well as its work with the cross-agency President's Malaria Initiative.

As part of this initiative, CDC provides consultation, technical assistance, and training to malaria-endemic countries and to multinational and United States agencies and organizations on issues of malaria prevention and control. Through PMI, CDC is also working in collaboration with the global Roll Back Malaria program, the WHO/Global Malaria Program, the World Bank, the Global Fund to Fight AIDS, Tuberculosis, and Malaria, and other NGOs and faith-based organizations and academic institutions engaged in the fight against malaria.

CDC also provides technical assistance for malaria research and control activities to other, non-PMI countries in Latin America and Southeast Asia.

- CDC helped develop and implement cutting-edge survey methods utilizing hand-held computers equipped with global positioning systems to conduct household surveys in remote villages, greatly improving the epidemiological understanding of malaria.
- CDC staff evaluated the performance of health workers who treat patients with suspected malaria, thereby contributing to long-term efforts to strengthen the capacity of local health care workers in malaria-impacted counties.
 - control in pregnancy; better measure malaria transmission so that prevention impact can be better assessed; evaluate novel delivery approaches for ACTs to increase access and coverage; conduct population-based surveillance to assess effectiveness of newly introduced antimalarial therapies; and participate in the world's first late-stage clinical evaluation of a candidate malaria vaccine.
 - Is collaborating in a high-level global consultation to develop the long-term research agenda for malaria elimination and eradication

CDC also provides technical assistance for malaria research and control activities to other, non-PMI countries in Latin America and Southeast Asia.



Fogarty International Center

<http://www.fic.nih.gov/>

The Fogarty International Center is the National Institutes of Health's (NIH) international component. Fogarty works to address global health challenges through research and training collaborations with international partners.

- Fogarty researchers performed work designed to determine what adverse effects might result from a program that administered anti-malarial drugs to infants at the same time they received expanded program of immunization (EPI) vaccinations, regardless of whether or not the infant was suffering from malaria. The researchers found that although this method would likely not result in adverse effects in most areas, it could lead to increased drug resistance in areas with certain patterns of anti-malaria drug use and malaria transmission.
- Fogarty researchers performed work that investigated the efficacy of malaria diagnosis by microscopy, currently the global standard for definitive diagnosis of the disease. The researchers identified in quantitative terms the extent of critical inaccuracies in diagnosis by microscopy. This data that supports efforts to improve clinician training, reference standards, interpretive rigor, and diagnostic tools.
- Scientists at the University of Nairobi supported by Fogarty published a study on the feasibility of controlling malaria by creating and introducing genetically modified mosquitoes that are unable to transmit the malaria parasite to humans, and which would replace wild populations of mosquitoes. The researchers determined that although this strategy has become more feasible in recent years, particularly after the genome of the *Anopheles gambiae* mosquito was sequenced, engineering a mosquito that will both carry an anti-malaria gene and pass this gene on through successive generations remains beyond the reach of scientists using current knowledge and methods.
- Fogarty supported the work of researchers in Ghana and Malawi investigating the misdiagnosis of malaria. These researchers found that malaria is often under-diagnosed in areas where it is rare, and over-diagnosed in places where it is more common. The authors of the study that resulted from this research noted that while misdiagnosis is certainly a problem for patients, it also presents challenges to the accurate collection of data in clinical trials and evaluations of anti-malaria programs.
- Fogarty research led to a significantly increased understanding of the variability of malaria across sub-Saharan Africa in terms of transmission intensity. Fogarty investigators provided quantitative measures of this variability, the understanding of which has the potential to markedly enhance efforts at malaria control on the continent.
- Fogarty supported a study that investigated connections between the malaria parasite's genome and resistance to chloroquine and atemesinin. Resistance to these drugs is a central threat to global efforts to control malaria. Chloroquine resistance contributed to the limited success of earlier efforts to eradicate the disease, and combination therapies involving artemisinin are currently the most effective therapy for many cases of malaria. The study was based on blood samples from malaria patients from South America, the South Pacific, and Asia.



National Institutes of Health – National Institute of Allergy and Infectious Diseases Success Stories

<http://www3.niaid.nih.gov/>

NIAID is the primary entity in the U.S. government supporting malaria research and development. Traditionally, NIAID's focus has been on basic research; more recently, the agency has undertaken a "major shift," announced in its May 2008 "Strategic Plan for Malaria Research," to focus also on down-stream clinical and field-based research.

NIAID has played a central role in the discovery of the main component of RTS,S, the most advanced malaria vaccine candidate in existence. RTS,S is currently undergoing Phase II clinical trials in Mozambique, and early evidence suggests that the vaccine reduces clinical malaria in children by 35 percent, and severe malaria by 49 percent. NIAID funding supported the early studies that made RTS,S possible by identifying an immune response to the malaria parasite.

NIAID is engaged in an active partnership with the PATH Malaria Vaccine Initiative to develop malaria vaccine candidates. One candidate, developed from blood stage malaria parasite antigens, is already undergoing Phase I trials.

NIAID is supporting groundbreaking research being performed at the Seattle Biomedical Research Institute designed to make new types anti-malaria tools. Researchers working with NIAID support are investigating ways to block the propagation of the malaria parasite by altering its genetic material, a technique with tremendous potential to reduce the global toll of this deadly disease.

NIAID has partnered with biotechnology company Sanaria to develop a malaria vaccine based on a live-attenuated whole parasite. This vaccine candidate is based on an irradiation process that leaves malaria parasites alive and whole, but sterile. Initial studies have indicated that being bitten by mosquitoes carrying these irradiated parasites results in a 90 percent efficacy for up to ten months. Phase I clinical trials are expected to begin in 2008.

A recent NIAID-supported study found that the chloroquine resistance that the malaria parasite began to develop in the 1950s, and which currently limits the effectiveness of this once-standard anti-malaria drug, may erode fairly quickly when chloroquine use is temporarily suspended. NIAID-supported researchers in Malawi found that chloroquine was 99 percent effective at treating children with malaria 10 years after the drug was replaced in Malawi in 1993 due to parasite resistance.

The NIAID-operated Malaria Research and Training Center (MRTC), a joint project with the University of Bamako in Bamako, Mali, is one of only three NIAID "International Centers for Excellence in Research."

In 2007, NIAID launched the "NIAID Partnerships with Public-Private Partnerships," which initiated support for product development public-private partnerships (PDPs), which have been created to "address the widening gap in product development for neglected infectious diseases" caused by the "failure of traditional market-driven R&D" in this sector. Already, this innovative collaborative effort has resulted in awards to the PDPs Drugs for Neglected Diseases and Medicines for Malaria Venture.

In May 2008, NIAID launched its *NIAID Strategic Plan for Malaria Research* and its *NIAID Research Agenda for Malaria*, targeting the establishment of "a continuous pipeline of new and effective antimalarial drugs" to



overcome resistance, as well as to develop and deploy new “diagnostics, vector management tools, and effective vaccines.”

World Health Organization - Global Malaria Programme

<http://www.who.int/en/>

The Global Malaria Programme (GMP) is part of the WHO, the foremost global authority on health. GMP is responsible for malaria surveillance, monitoring and evaluation, policy and strategy formulation, technical assistance, and coordination of WHO's global efforts to fight malaria.

WHO works with countries to conduct malaria surveys, assist to strengthen or create a country profile database to evaluate performance and intervention coverage in over 100 countries, provide estimated malaria burden (morbidity and mortality) in countries with different malaria profiles

WHO provides technical assistance to countries for proposal development to the Global Fund to Fight AIDS TB and Malaria. WHO will continue its normative work to develop policy guidelines and recommendations to countries for malaria program scale up including:

- Access to Artemisinin-based Combination Therapy (ACTs) - WHO assists countries to scale up treatment and home case management programs so that persons living in these countries will be provided with ACTs.
- Indoor Residual Spraying (IRS) WHO provides technical assistance to countries so they can scale up coverage by IRS in appropriate target districts.
- Insecticide Treated bed Nets (ITNs) - WHO assists countries to scale up distribution of long lasting insecticide treated bed-nets (LLINs). This will extend protection from vulnerable groups (children <5 and pregnant women) to the whole community.
- Elimination - WHO works with countries who are seeking certification of malaria elimination. (1 country will have malaria elimination certified by 2008 (United Arab Emirates), 2 further countries (Oman, Morocco) will be on-track to be malaria free by 2010, 6 countries will be reducing malaria cases and transmission to eliminate malaria by 2012, 2 countries will be supported to eliminate malaria by 2015

WHO's Global Malaria Programme technical assistance activities will ensure that global investments in malaria such as the GFATM, World Bank Booster Program, US President's Malaria Initiative, and others are most effectively used to help countries achieve their malaria control objectives. Thus far many programs are lagging behind as countries do not have sufficient technical skills or capacity to absorb the funding. GMP, by helping countries with the correct policy and technical advice, strengthening country capacity and coordination with partners to resolve implementation barriers, will help countries to fully utilize available funds and achieve the above-outlined results.

WHO's ability to carry out its mission is based primarily on the extra-budgetary resources that it receives from Member States. For the organization's work on Malaria during the past biennium, these extra-budgetary funds represented almost 87% of the total budget. The Administration, through President's Malaria Initiative, should strengthen its support of the World Health Organization Global Malaria Programme by providing resources, financing and to coordinate country scale-up efforts as indicated by the Hyde Lantos Reauthorization Act of 2008 (Public Law 108-25).



The World Bank

<http://www.worldbank.org/>

The World Bank Booster Program for Malaria Control in Africa is a ten year plan to reduce malaria mortality rates in African countries. The Booster Program is designed to augment and reinvigorate existing programs, and does not constitute an independent initiative. It builds on a revitalized Roll Back Malaria Global Partnership (RBM) and complements the efforts of other partners both at national and regional levels in an effort to bring malaria under control.

In the initial three-year intensive phase the Booster program committed approximately US\$470 million to support countries willing and ready to improve and expand their malaria control efforts. This reflects a nearly nine-fold increase in IDA funding for malaria control in Africa. By the end of 2007, the Booster Program helped distribute nearly 20 million long lasting insecticidal nets (LLINs) and more than 15 million doses of artemisinin-based combination therapy (ACT). In total, more than 21 million LLINs and over 42 million doses of ACT are expected to be distributed under projects in the Booster Program's first phase ending in 2008.

Department of Defense

<http://www.defenselink.mil/>

Infectious diseases have long influenced the success or failure of military operations, the Department of Defense has historically played a central role in U.S. efforts – and indeed global efforts – to combat malaria. With the Army as the lead service, military malaria scientists have made some of this century's most significant malaria research breakthroughs.

- The U.S. military has played a major role in the development of every anti-malaria drug in use today, with the exception of the Chinese-developed drug artemisinin. Drugs such as mefloquine that were originally developed by the U.S. military have saved the lives not only of U.S. servicemembers, but also the lives of literally hundreds of thousands of civilians in the U.S. and abroad. DOD labs also have been central to the development of halofantrine and tafenoquine, and an overseas DOD lab performed study whose results provided evidence that the antibiotic doxycycline is effective in the prevention of malaria. Since this study was produced, doxycycline has become a useful tool in the prevention of malaria.
- Anti-malaria prophylaxis and therapeutics are critical in the ongoing fight to control malaria, but attempts to eradicate the disease globally will not be successful until an effective vaccine is developed. The DOD's malaria vaccine program is among the best in the nation. In cooperation with corporate partner SmithKline Beecham Biologicals, the Walter Reed Army Institute of Research (WRAIR) is developing a multi-antigen, multistage malaria vaccine. This development effort has already produced the RTS,S vaccine, the most advanced vaccine candidate yet developed and one that is already undergoing clinical trials. In addition, Navy malaria researchers at the Naval Medical Research Center (NMRC) are working with several public and private partners to develop a DNA based malaria vaccine.
- DOD plays an integral role in the Malaria Genome Project, an international collaborative effort aimed at sequencing the genome of plasmodium falciparum, the most deadly strain of the malaria parasite. DOD provided the genetic material for the project, and has lent its considerable expertise to it.
- DOD researchers are working to develop a field diagnostic test that will allow deployed troops to quickly determine whether they have been infected with malaria. Currently, field malaria diagnosis is difficult and based primarily on sometimes ambiguous symptoms because definitive diagnosis requires laboratory examination of blood smears, a standard difficult or impossible to achieve under certain field conditions.



DOD research on Rapid Diagnostic Tests (RTDs) will lead to field tests allowing for more reliable diagnosis of malaria, aiding treatment and reducing unnecessary medication.

Success Stories of Malaria Control

Progress in the fight against malaria can be made, often seeing immediate results, with sufficient and sustained investments. The following document highlights malaria success stories in the areas of:

- Child Survival
- Bed Nets
- Indoor Residual Spraying
- Intermittent Preventive Treatment
- Artemisinin based Combination Therapies
- Research
- Vaccine Trial
- Private Sector Engagement
- Faith Based Engagement
- Grassroot Engagement
- Integration with HIV and AIDS programming

Child Survival (PMI)

Each year, nearly a million people die from malaria, 85% of whom are children. Of the 9.2 million preventable child deaths that occur each year, malaria is the fourth leading cause, resulting in the death of one child every 40 seconds. It is estimated that 65 percent of deaths to children under the age of five occur in African countries alone. Many of these deaths are preventable and treatable using insecticide-treated bed nets, indoor residual spraying, intermittent preventive treatment, and artemisinin-based combination therapy drugs. Multiple examples reveal the effectiveness of these prevention and treatment methods in reducing child mortality.

Although most countries are falling short of global malaria goals and coverage of key interventions remains low, evidence suggests progress is being made. In sub-Saharan Africa, under-five mortality decreased by 14 percent between 1990 and 2006. Evidence suggests African countries have expanded coverage of insecticide-treated nets where 16 of 20 countries have at least tripled coverage since 2000. Kenya has started to show promising data with an increase in the percentage of children sleeping under insecticide-treated mosquito nets rising from 3 percent in 2000 to 51.7 percent in 2006. Some 34 percent of children with fever in sub-Saharan Africa are treated with antimalarials, but many children are still using chloroquine, which is less effective. As a result, nearly all African countries have adopted the more effective artemisinin-based combination therapy as the first-line treatment. The percentage of febrile children under five receiving antimalarial medicine is countries like Tanzania have increased to 58 percent. [\[1\]](#), [\[2\]](#)

Bed Nets (PMI)

Long-lasting Insecticidal- nets (LLINs) have proven effective in reducing mortality in areas of endemic malaria and have been a critical tool in the global fight against the disease. The ITNs kill mosquitoes carrying malaria, helping disrupt transmission of the parasite leading to both personal and community wide protection. The use of ITNs show a reduction in transmission of malaria by as much as 90 percent and mortality by about 20 percent in areas with high coverage rates. Consistently sleeping under an



ITN has been shown to decrease all-cause child mortality by 17 to 29 percent. There is also evidence that if more than 80 percent of households in an area sleep under an ITN, there is a protective effect for the entire community and malaria transmission is significantly reduced.

The success of ITNs greatly increased from 2005 to 2006 due in part to the President's Malaria Initiative (PMI). PMI has been able to deliver more than one million insecticide-treated nets, including the distribution of free LLINs to children and pregnant women in camps for internally displaced persons in Uganda. Furthermore, in partnership with the Global Fund to Fight AIDS, Tuberculosis and Malaria, voucher programs in Tanzania, have enabled pregnant women and mothers of infants have been able to purchase mosquito nets at participating retailer outlets. In addition, PMI is also working on retreatment of nets. In Uganda, an insecticide re-treatment program for 505,000 nets is helping to protect residents from malaria in 28 districts. Re-treating nets is an essential interim strategy to continue to provide protection against malaria for owners of traditional nets until existing nets are replaced with LLINs.^[3]

Indoor Residual Spraying

Indoor Residual Spraying (IRS) is one of the primary vector control interventions for reducing and interrupting malaria transmission. It helps to reduce the life span of and kill vector mosquitoes, thus disrupting the cycle of transmission of malaria. For example, malaria incidence was reduced by 90 percent or more in major areas of tropical Asia and Southern America during a previous eradication program through a combination of IRS and other measures. European nations, USSR, and several Caribbean countries were able to eliminate malaria through the use of IRS and other preventative methods.

Scientific evidence of IRS efficacy in reducing or interrupting malaria transmission in different epidemiological settings has been available since the 1940s and 1950s. Numerous studies have shown that IRS has substantially reduced infant and child mortality. In Africa, malaria eradication pilot projects initiated between the 1950s to the 1970s demonstrated that malaria was highly responsive to control by IRS with significant reduction of mosquitoes and malaria.^[4] The initiative was successful in reducing an estimated 7,700 malaria cases in one month, and 200 fewer deaths of children under the age of five in Zanzibar alone.^[5] In 2005, as part of the Zanzibar initiative, 454 community members were hired and trained as indoor residual sprayers and supervisors through PMI, helping to create jobs and livelihoods for both men and women.

Intermittent Preventive Treatment (IPT)

Thirty million women in the malaria endemic regions of Africa become pregnant each year, putting them at high risk of contracting the disease. Pregnant women in endemic areas are at two to ten times more likely to contract malaria than are non-pregnant women, due to decreased immunity. Malaria in pregnancy contributes to twenty thousand newborn deaths each year. Additionally, twenty-five percent of severe maternal anemia cases and twenty percent of low birth-weight babies are attributed to malaria.^[6]

Intermittent preventive treatment for pregnant mothers (IPTp) is a key component of preventing malaria among this vulnerable population. IPTp involves providing all pregnant women with at least two preventive treatment doses of sulfadoxine-pyrimethamine (SP) an effective anti-malarial drug during routine antenatal clinic visits. This intervention is highly effective in reducing the proportion of women with anemia and placental malaria infection at delivery. IPT is safe, inexpensive and effective. A study in Malawi evaluating IPTp showed a decline in placental infection from 32 percent to 23 percent and in the number of low birth weight babies from 23 percent to 10 percent. It also found that 75 percent of all pregnant women took advantage of IPT when offered. Kenya's coverage of IPTp has grown from 30 percent to 75 percent. The benefits of intermittent preventive treatment for both maternal and infant health have been seen in a range of different malaria transmission settings and have proven to be an effective prevention strategy.^[7]



Artemisinin based Combination Therapies

With approximately a million people deaths from malaria each year, 90 percent of which occur in sub-Saharan Africa, Artemisinin based Combination Therapy (ACTs) is a necessary and effective treatment in the fight against malaria. Malaria treatment drugs have been available for years, but increased drug resistance to other mono therapy have rendered such treatments such as chloroquine, sulfadoxine-pyrimethamine and amodiaquine ineffective in some regions. Resistance has not developed among ACTs, which have been show to produce fast recoveries by killing parasites rapidly and reducing the risk of transmission from one treated person to another. ACTs are now being distributed to 29 percent of African countries and 65 percent of countries outside of African that are most affected by malaria.

Countries such as Tanzania have been distributing ACTS since 2006. In a period of two years, the country has obtained and distributed over 600,000 ACT drugs in surrounding communities and refugee camps. Tanzania has been able to provide training to 1,000 health professional and raised awareness of ACTs effectiveness. It also obtained 550,000 rapid diagnostic test (RDTs) to help properly diagnose malaria and thus provide an added defense against the development of malaria resistance. The distribution of ACTs along with other intervention methods have helped to decrease the percentage of positive malaria blood slides in children under the age of 2 by 90 percent. Additionally, it has decreased the percentage of positive malaria blood slides in the Muleba District Hospital in patients of all ages by 37 percent in the period of two years.^[8]

Research

Research has played an integral part in the fight against malaria. It has equipped the anti-malaria effort with new drugs that are highly effective for treatment, new and improved vector control strategies, and a broadening pipeline of promising vaccine candidates. Current research varies across disciplines and concentrations.

New technology is being employed to help increase the availability of life-saving anti-malarial drugs that remain largely unaffordable to the most vulnerable populations. A new collaboration developed between California researchers is setting out to create synthetic ingredients for anti-malarial drugs, which will help decrease the high cost of these treatments. Through cheaper medication, this project has the potential to reduce malaria mortality rates and decrease the pervasiveness of counterfeit drugs. By providing the market with safe, low-cost ACTs, potential profits generated by criminal counterfeiting activities could be substantially lowered.^[9]

New research is also underway to reduce resistance to insecticides used on ITNs and for IRS. Though insecticide research has been under-funded, the Gates Foundation-supported Innovative Vector Control Consortium (IVCC) is working to develop new active ingredients, find public health applications for agricultural pesticides and improve some of the existing malaria control insecticides.

Research initiatives are also being concentrated in finding better and cheaper ACTs, and eventually replacing them with better and completely synthetic combinations. Medicines for Malaria Venture (MMV), a Product Development Partnership, has the largest-ever pipeline of new antimalarials in development. Their first product, a new ACT that is especially formulated for young children, is due to be launched in the beginning of 2009. Two other ACTs which promise to be easier to use, cheaper to produce and that have longer protection against future infections are due to be launched by 2010. A wholly synthetic drug that may be a “one-dose cure” will soon go into human clinical trials.

Vaccine Trials

Approximately 3.3 billion people are at risk of malaria worldwide, yet no vaccine exists to prevent its spread. Vaccines are one of the most effective tools for preventing disease. Most are not only cost effective and easily administered, but have significantly reduced the spread of infectious diseases.



Developing a malaria vaccine would help to prevent millions of deaths worldwide over the course of many years.

Current research and preliminary findings in the development of a malaria vaccine contain promising evidence for the fight against the disease. For example, after 40 years of worldwide efforts to develop a malaria vaccine, the first-ever Phase 3 trial of a malaria vaccine candidate, RTS,S, is scheduled to begin in late 2008 or early 2009. Results of a trial of more than 2,000 children started in 2003 in southern Mozambique demonstrated the feasibility of administering a malaria vaccine in children. Findings from this trial published in 2004 and 2005 in the medical journal *The Lancet* showed that RTS,S was effective for at least 18 months in reducing clinical malaria by 35 percent and severe malaria by 49 percent, thus establishing RTS,S as the most advanced malaria vaccine candidate. Recent data, published on October 17, 2007, showed that RTS,S reduced infection by 65 percent over three months of follow-up, after a full vaccination course in infants, the group most vulnerable to malaria. The vaccine also reduced the risk of clinical malaria by 35.5 percent over a six-month period following the first dose. Importantly, it also displayed a promising safety and tolerability profile similar to standard Expanded Program on Immunization vaccines commonly given to infants, including comparable pain and swelling. The trial is the first proof-of-concept in infants of any malaria vaccine candidate and substantially advances the vision that a vaccine could contribute to reducing the intolerable burden of disease and death caused by malaria.

Private Sector Building Local Capacity

The private sector played a key role in malaria intervention, treatment and prevention by providing new and innovative ideas to fight off the disease. With 90 percent of malaria deaths taking place in sub-Saharan Africa, the local manufacture of Olyset bed nets has helped to address the problem from the ground up through local resources and distribution. Over 3,200 jobs have been created in the venture, supporting at least 20,000 people, 90 percent of which are women. Olyset Net factory in Arusha is a 50/50 joint venture locally based in Tanzanian. The new facilities bring net production capacity in Arusha to 10 million per year. These LLINs have proven to be effective tools in the fight against malaria and have helped to reestablished the communities self confidence by bring health and increased revenues.^[10] Other companies, such as ExxonMobil have worked with many different partners to increase access to ITNs while Marathon Oil, Mozal (BHP Billiton) and AngloGold Ashanti and Konkola Copper Mines, among others, all support IRS programs, training spray teams and building up the expertise needed to sustain these essential programs. Drug companies such as Novartis and Sanofi-Aventis have worked with malaria-endemic country governments and other stakeholders to improve diagnosis and provide training for healthcare workers on best treatment practices. In addition, they have worked to improve knowledge of malaria among populations at risk so as to ensure they seek diagnosis and treatment promptly.

Faith Based

In most of sub-Saharan Africa, church mission health facilities provide 30 percent to 70 percent of total health care provision, especially in remote and isolated locations, making them powerful allies in the fight against malaria. In areas where government infrastructure is unreliable or non-existent, faith based groups help ensure hard-to-reach populations have access to life-saving tools for the prevention and treatment of disease.

An example of such success is the development of the project “Nets for Life” which been able to reach those living in hard to reach places in Africa by capitalizing on much of the infrastructure and relationships between churches. To date, 33,000 nets have been distributed in Angola, Kenya, Uganda, and Zambia through this program. In both Congo and Mozambique, 16,500 nets have been distributed, and an additional 16,500 will be distributed in Ghana and Burundi this year. The expenses for the program include



the cost of the net (average US\$6-7dollars) plus US\$6 dollars per net for monitoring, evaluation, education, vector management, advocacy for parallel effective malaria treatment and prevention methods, including drug access and indoor residual spraying.^[11]

Grassroots Engagement

The fight against malaria has benefited from contributions of grassroots initiatives. Many of these efforts have aided in capacity building, funding education training and distribution of bed nets.

Vietnam was once a country devastated by over 4,000 malaria deaths a year. The country's numerous rice fields and humid climate create a perfect breeding ground for malaria carrying mosquitoes. In a matter of ten years, Vietnam has been able to reduce the number of malaria related deaths to only 40 in 2005. The reduction in deaths has been a combination of strategies including their most successful local health worker campaign. Participants of the program are trained and equipped with basic malaria treatments and detection kits. Provided with these tools, the volunteer health workers go out into their perspective communities twice a week and conduct health tours of the area. They check to see that villagers are sleeping under properly treated nets, provide informational sessions to the village, look for signs and symptoms of the disease and report and monitor any cases. If malaria is suspected, the community workers collect blood samples and transport them via a motorcycle provided by the program to the closest clinic for analysis. ACT treatment is given free of charge and provided to the villagers. Communities all over Vietnam have been successful in organizing and creating change in each of their villages. This community initiative has been aided and sustained by political leadership and newly implemented policies that support such programs.^[12]

Integration with HIV and AIDS programs

Malaria and HIV and AIDS account for approximately 3 million deaths a year and, when combined, form a deadly synergy. People living with HIV and AIDS are more susceptible to malaria infection when bitten by an infected mosquito and more likely to transmit HIV due to increased viral load that often accompanies malaria infection. Those infected with malaria can also be more susceptible to HIV infection. As such, it is important that programs to address these diseases are well integrated.

The RAPIDS consortium in Zambia, comprised of six international NGOs, more than 180 local community-based organizations, the Zambian government, USAID, PEPFAR and other local partners, is an example of successful integration. Partially funded by PEPFAR, RAPIDS is meeting the needs of people living with and affected by HIV and AIDS by providing prevention, treatment and care through more than 15,000 volunteer caregivers at the community level. Relying on the infrastructure and caregiver networks created for AIDS-related activities, and in coordination with PMI, RAPIDS was able to distribute 500,000 LLINs to children and pregnant women at the household level. Not only did this integrated approach enable efficient distribution of LLINs, but evaluation revealed the household delivery approach in place for AIDS programming ensured proper use of the bed nets. Eighty percent of all households who had received training were properly using the LLINs in a follow-up survey.

Contact Information

This overview on US and global malaria programs were compiled by the Global Health Council on behalf of the Malaria Roundtable, a coalition of organizations engaged with combating Malaria and convened in Washington, DC. For further information about the Malaria Roundtable or this document, please contact Joanne Manrique Chair of the Malaria Roundtable at the Global Health Council jmanrique@globalhealth.org or 202-833-5900, x 3232. We hope you will consider us as a resource as you move through the transition. Thank you for your consideration of these early actions.



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