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PMI | U.S. PRESIDENT'S MALARIA INITIATIVE

LED BY

USAID FROM THE AMERICAN PEOPLE

CDC

MESSAGE FROM U.S. GLOBAL MALARIA COORDINATOR DR. DAVID WALTON

Photo credit: PMI

As U.S. Global Malaria Coordinator, I am privileged to lead an initiative that is at the forefront of the world's crucial fight to end malaria. The U.S. President's Malaria Initiative (PMI) exemplifies what can be achieved when the United States and other countries partner together to take on the world's toughest challenges.

Thanks to the generosity of the American people and steady support from Congress, PMI has helped lead global efforts that have saved 11.7 million lives and prevented more than 2 billion malaria infections since 2000. These are truly impressive numbers, reflecting not just precious lives saved but also healthy children who can go to school and pursue their dreams, parents who can work to feed their families and live in dignity, and businesses that have the staff to grow and prosper—essential elements of thriving communities, contributing to a world that is also safer and more prosperous for Americans.

While much has been achieved, we have more to do before parents in countries with malaria no longer fear that a mosquito bite could end their child's life. We face multiple complex challenges, such as drug and insecticide resistance, an invasive mosquito in Africa, climate

PHOTO: *A student receiving an insecticide treated net at school in Tanzania.*
Photo credit: Johns Hopkins University - TVCA

change, conflict, and threats from other diseases such as COVID-19 and Ebola, that are complicating efforts to eliminate malaria.

Despite these significant hurdles, there is cause for hope. In 2021, countries around the world largely held the line against further setbacks to malaria control and elimination. Malaria cases rose, but at a slower rate than from 2019 to 2020, and malaria deaths fell slightly, reversing the devastating trend of just a year earlier.

While no death from malaria is acceptable, a reduction in deaths is a welcome sign that investments in malaria programs remain effective, even in the most challenging environments. Through our strategy for 2021–2026, PMI is collaborating closely with partner country governments to help ensure those not previously covered by malaria prevention tools and treatment are no longer left behind. We are investing in the immense potential that exists in our partner countries to lead the fight against this disease. By working with communities around the globe to identify and implement local solutions, PMI is saving lives and rekindling hope. With strong support from Congress, I am confident that we can turn the tide in this fight and end malaria in our lifetime. ■

ABOUT THE U.S. PRESIDENT'S MALARIA INITIATIVE

PHOTO: Community Health Worker Erdoo Aondover providing medicine to prevent malaria to the mother of a young child in Benue State, Nigeria. Photo credit: Valentine Edoziem, Breakthrough Action Nigeria

PMI is the U.S. government's largest program leading the fight against malaria. Since its creation in 2005, together with its partners, PMI has saved millions of lives and contributed to healthy and productive communities around the world.

Thanks to the bipartisan support of Congress and the generosity of the American people, PMI works in 24 partner countries in sub-Saharan Africa and three programs in the Greater Mekong Subregion in Southeast Asia—countries that account for almost 90 percent of the world's malaria cases and deaths. Led by the U.S. Agency for International Development (USAID) and co-implemented with the U.S. Centers for Disease Control and Prevention (CDC), PMI partners with countries to support stronger, more resilient health systems that combat malaria and protect against current and future pandemics, strengthening global health security.

PMI has invested approximately $9 billion to help partner countries fight malaria. Our work began in 2006 in just three high-burden countries, with a budget of $30 million. In FY 2022, PMI invested $746 million across 27 countries.

My Administration is committed to making the vision of a malaria-free future a reality. Together, we can build a safer, more prosperous, and more equitable world for everyone.

—President Joe Biden

We focus our attention on all who suffer from this terrible disease – especially the millions on the continent of Africa. We remember the millions more who died from this entirely preventable and treatable disease. As a compassionate nation, we are called to spread awareness about malaria – and we're called to act.

—Former President George W. Bush

PHOTO: *Karim Kane and his wife Konimba Bagayoko with their 21-day-old daughter at their home in Mali. Photo credit: Mwangi Kirubi, PMI Impact Malaria*

The U.S. government, through PMI and the U.S. contribution to the Global Fund, plays a leading role in helping partner countries and saving lives. Together with our partners, PMI has helped save **11.7 million** lives and prevent **2 billion** malaria infections since 2000.

In FY 2022, PMI benefited more than **700 million** people.

Since 2006, in countries where PMI works, global efforts have supported:

- **42.6%** Average decrease in child death rate from all causes[1]
- **27.2%** Decline in malaria case rates[2]
- **45.6%** Decline in malaria death rates[2]

PMI DELIVERED:

- **50.7m** mosquito nets (ITNs) — TO PROTECT: **101.4m** people
- Insecticide to spray **5.3m** homes (IRS) — TO PROTECT: **19.2m** people
- **48.1m** seasonal preventive treatments (SMC) — TO PROTECT: **12m** children
- **21.6m** preventive treatments in pregnancy (IPTp) — TO PROTECT: **7.2m** women
- **94.9m** rapid diagnostic tests (RDTs) — TO PROTECT: **94.9m** people
- **80m** malaria medicines (ACTs) — TO PROTECT: **80m** people

PHOTO: *A community health worker records doses administered to young children during a malaria prevention treatment campaign in Cameroon. Photo credit: Souleymanou, PMI*

HEALTH WORKERS who deliver malaria prevention and treatment services are at the heart of PMI's work with partners around the world.

In FY 2022, PMI funded **176,700 trainings** for health workers.

28,359 on indoor residual spray

22,324 on preventive treatment in pregnancy

49,790 on seasonal preventive treatment for children

33,818 on diagnosis

42,410 on clinical care

MALARIA: ONE OF THE WORLD'S OLDEST AND DEADLIEST DISEASES

PHOTO: *Two community health workers in DRC demonstrating how to install a mosquito net for a baby. Photo credit: Aimé Tshibanda, USAID IHP*

Malaria is the world's deadliest mosquito-borne illness. It was eliminated in the United States by 1951, but almost half of the world's population is still at risk from the disease. Malaria is transmitted through the bite of an infected female *Anopheles* mosquito. While anyone can get malaria, pregnant women and children have lower natural immunity and are more vulnerable to the disease. Today, malaria is preventable and treatable, but if not treated promptly the illness can become severe and rapidly progress to death. ■

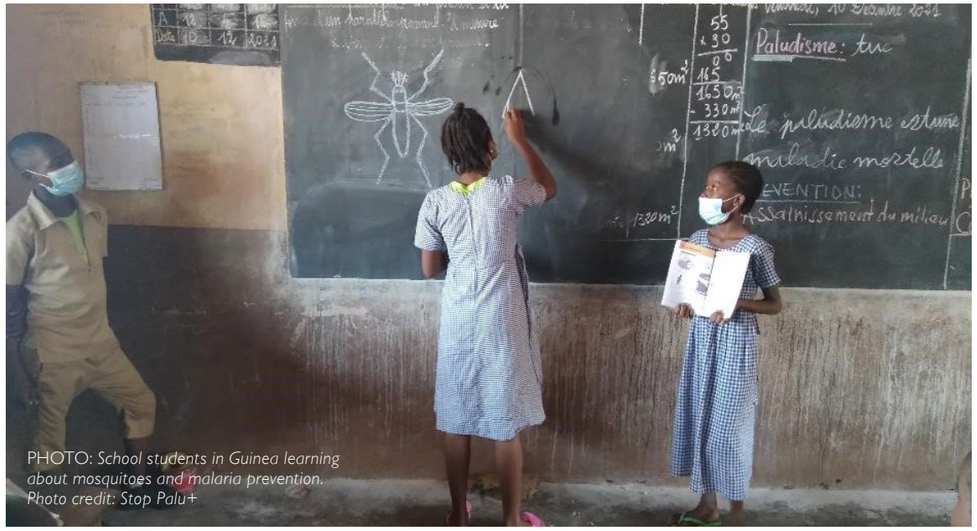


PHOTO: *School students in Guinea learning about mosquitoes and malaria prevention. Photo credit: Stop Palu+*

CONTRIBUTING TO A SAFER AND MORE PROSPEROUS WORLD: The devastating impact of malaria extends beyond health and well-being; it can also be economically ruinous, draining over one quarter of the income of many affected families and accounting for up to 40 percent of health spending in some countries.[3] It is estimated that in some African countries, malaria reduces GDP growth by approximately 1.3 percent each year.[4]

Missed workdays mean lost income and shuttered businesses.

Missed school days limit child development and a country's future.

By fighting this disease, the United States is helping unlock the productivity and well-being of countries around the world while contributing to a stronger world economy, with enhanced trade opportunities for the United States.

MALARIA TODAY

PHOTO: *Change agents in Zambia facilitating a radio listening group that emphasizes the benefits of using bed nets and malaria tests and treatments for malaria elimination. Photo credit: Dr. Webby Phiri, PATH*

The World Health Organization (WHO) estimates that there were 247 million malaria cases globally in 2021, an increase of around 2 million cases compared with 2020, signifying a slower rate of increase than the year before. Malaria deaths, which increased by 10 percent from 2019 to 2020, declined slightly in 2021 with a total of 619,000. Africa accounted for around 95 percent of all cases and 96 percent of deaths. Almost 80 percent of deaths were of children aged under five years. The dramatic gains achieved in the fight against malaria from 2006 to 2015 have leveled off, and the world is now up against major threats to progress. ■

The population at risk for malaria has almost doubled since 2000 and global funding has plateaued, resulting in a $3.8 billion deficit in the amount the WHO estimated was needed to fight malaria just in 2021.[5] The United States contributed 36 percent of global malaria funding in 2021; malaria endemic countries contributed 33 percent.

COMPLEX AND INTERSECTING CHALLENGES ARE MAKING IT MORE DIFFICULT AND MORE COSTLY FOR COUNTRIES TO PROTECT THEIR POPULATIONS FROM MALARIA

Between 2019 and 2021, an estimated additional 13.4 million malaria cases were attributed to health service disruptions during the **COVID-19 pandemic**;[6]

Malaria parasites, which continue to develop **resistance to drugs**, are also starting to **evade detection** through the most common rapid malaria test, while mosquitoes' widespread and increasing **resistance to insecticides** threatens to undermine the effectiveness of key malaria prevention tools;

An invasive mosquito that can dwell in urban settings is threatening to upend gains against malaria in Africa;

Climate change brings warmer and wetter weather that can make it easier for malaria-carrying mosquitoes to breed and spread disease, while severe weather disrupts malaria programs; and

Conflict causes breakdowns in health infrastructure, interruptions in supply chains, and the movement of people, making it difficult to provide malaria prevention and treatment services.

REGAINING MOMENTUM IN THE FIGHT AGAINST MALARIA

PHOTO: *A child receiving seasonal malaria prevention medicine in Mali. Photo credit: Impact Malaria Mali*

We are at a critical point in the fight against malaria and there is no time to lose. Across the world, a young child dies of malaria almost every minute.

In October 2021, PMI launched its strategy for 2021–2026, *End Malaria Faster*, which outlines how PMI will work with national malaria programs in partner countries to drive toward saving more than four million lives and averting over one billion malaria cases by 2025. The strategy shifts towards a more tailored approach that meets each country where they are in their journey to end malaria.

Through a focus on **reaching the unreached, strengthening community health systems, keeping malaria services resilient, investing locally, and leading and innovating,** and with continued support from Congress, PMI and our partners can regain momentum in the battle to end one of history's deadliest diseases. ■

REACHING THE UNREACHED

PHOTO: *Community health worker Margaret Beetsel making her way through flood waters to administer malaria medicines to children in Makurdi, Benue state, Nigeria.*
Photo credit: Nomtai Tukur, GHSC-PSM, Nigeria

Many people living in remote and rural communities are not reached by lifesaving malaria prevention and treatment services. They may be an hour or days away from a health clinic. Malaria prevalence is also higher in rural areas. PMI is working to make sure everyone at risk has access to the critical tools and medicines they need.

PMI is reaching the unreached by bringing care to people where they live. For example, PMI supported the development of service delivery centers in 40 hard-to-reach communities in some of Zimbabwe's highest malaria burden provinces. Making insecticide-treated nets available through these centers led to a 137 percent increase in nets distributed in one of the districts, showing that removing barriers to obtaining malaria prevention tools can significantly increase the number of those covered and save lives. Liberia expanded its net delivery strategy by distributing almost 50,000 insecticide-treated nets through schools to reach children and raise their awareness about preventing malaria. For some communities in Nigeria, a country that accounts for a major portion of the world's malaria burden, the closest source of medical care

PHOTO: *Staff using geospatial data tools to implement insecticide spraying of homes in Zambia. Photo credit: Akros*

is a private sector pharmacy. PMI trained more than 1,000 private sector pharmacy assistants in remote communities on how to test for malaria, treat uncomplicated cases, and refer more severe cases to health facilities, expanding the reach of services to communities previously lacking this critical care. In Zambia, PMI developed micro planning maps down to the village level and a mobile application to guide and track the delivery of indoor residual spraying to protect households from mosquitoes and ensure no communities or structures are missed. By implementing targeted, community-specific approaches like these, PMI can get the right tools to the right places at the right time to reduce malaria cases and deaths. ■

PHOTO: *Malaria medicines being transported to Karyo Dispensary, which serves 6,400 people in northwest Nigeria. Photo credit: Global Health Supply Chain Program-Procurement and Supply Management, Nigeria*

PHOTO: *PMI supported transforming regular bed nets into extra large nets to cover the group sleeping spaces for children in schools in Senegal. Photo credit: Olivier Le Blanc, USAID Senegal*

PHOTO: PMI social and behavior change specialists provide information on how to prevent malaria to forest goers and migrant populations in Cambodia. Photo credit: Ren Sophearth, Partnership for Development and Action

Cambodia has maintained zero malaria deaths since 2018. Today, malaria cases in Cambodia usually occur among hard-to-reach populations, such as forest workers and migrant populations. PMI provides malaria information and preventive, diagnostic, and treatment services to help these populations stay healthy.

Photo credit: Marcelino Uyango, PSI Angola

PMI provided insecticide-treated nets to more than 6.5 million people in Angola during a mass distribution campaign in FY 2022. Distribution teams forded rivers and crossed mountains to hand-deliver the nets to even the most remote communities, ensuring that people have access to this potentially lifesaving tool regardless of where they live.

Photo credit: Alberto Zingany, PSI Angola

Photo credit: Marcelino Uyango, PSI Angola

Photo credit: Marcelino Uyango, PSI Angola

STRENGTHENING PRIMARY AND COMMUNITY HEALTH SYSTEMS

PHOTO: *A mother brings her sick baby to a community health worker in Benin. Photo credit: Ashley Garley, PMI*

PMI is working with partner countries to tackle malaria head-on at the community level where outbreaks of malaria and other pandemics often start and can be stopped. Community health workers on the front lines of the disease bring vital, lifesaving care to millions of people. By investing in training, supervising, and equipping health workers at health facilities and in communities, PMI is helping partner countries transform and extend community and frontline health systems to end malaria and improve the quality and reach of primary health care.

Malaria services are not delivered in isolation; they are delivered through holistic primary health care systems that provide prenatal care, fever management, treatment for pneumonia, diarrhea and malnutrition, family planning, and much more. Malaria services present opportunities to strengthen systems to deliver other essential services. In Guinea, for example, the distribution of medicines to prevent malaria provided an opportunity for children and pregnant women to catch up on missed routine vaccinations for diseases such as diphtheria, yellow fever, and tetanus. In this way, PMI's support for malaria prevention and treatment strengthens wider frontline and community health systems.

In many PMI partner countries, host governments and other partners supply the same community health workers who test and care for patients with malaria with oral rehydration salts, zinc, and antibiotics to save children from other deadly diseases such as diarrhea and pneumonia. This integrated approach to providing care means that health workers caring for children with fevers that could be caused by malaria can also help children with other common childhood illnesses.

In FY 2022, PMI supported case management of malaria at the community level in **25 countries**, most often through integrated platforms, providing an estimated **$33 million** to support approximately **100,000 community health workers** through training and supervision, equipment, and, in some countries, payment.

PHOTO: *An Integrated Community Malaria Volunteer performing a malaria test in Burma. Photo credit: URC/ Defeat*

PMI helps national malaria programs strengthen the quality of care provided by health workers through support for programs in which trained supervisors observe health care providers interacting with patients and provide tailored feedback. In countries with established programs, such as Ghana, Kenya, and Zambia, around 90 percent or more of observed health workers met the competency threshold for management of uncomplicated malaria after several rounds of supervision and training. Ensuring that health workers have the digital tools they need to provide timely and effective treatment is another way that PMI contributes to stronger health systems. In Madagascar, for example, PMI leveraged the USAID-supported CommCare application so that almost 4,000 community health workers can record health data and access information on how to treat malaria.

ADVANCING GLOBAL HEALTH SECURITY: PMI's investments in health workers, disease surveillance, laboratories, community engagement, and commodity supply chains will enable countries to be better prepared when the next pandemic hits.

Training community health workers to test for diseases and rapidly spread information and care

+

Building disease surveillance systems and supporting the analysis and use of data for evidence-based responses to disease threats

Strengthening the skills of laboratory technicians

+

Making supply chains more **adaptable and resilient**

=

Countries detecting and responding to future pandemics more quickly and effectively.

KEEPING MALARIA SERVICES RESILIENT

PHOTO: *Spray operators in Rwanda conducting a malaria awareness walk before spraying homes in 2022. Photo credit: VectorLink Rwanda*

PMI is adapting malaria services to respond and stay resilient despite ever-evolving complex and widespread challenges.

COVID-19 RESPONSE CREATES STRONGER HEALTH SYSTEMS

PMI's activities have proven resilient in the face of COVID-19, adapting to mitigate risk by distributing insecticide-treated nets door to door, providing health workers with personal protective equipment, and increasing the use of online tools for training health workers and tracking malaria services. Sustained support for community health systems to tackle malaria enables more rapid and effective national responses to a new threat like COVID-19, which, like malaria, has fever as a common symptom. Health workers trained to track and diagnose malaria fevers find people with COVID-19 and other diseases. Laboratory technicians testing for malaria apply their skills and knowledge to detect other health threats. From developing testing and treatment guidelines to differentiate COVID-19 from other febrile diseases (such as malaria, typhoid, and pneumonia) to training health workers on risk communication and community engagement, PMI and our partners are building on lessons learned from the COVID-19 pandemic to build stronger and more resilient health systems.

In a world where the next disease outbreak is only a plane ride away, PMI helps countries build critical capabilities to identify and stop health threats close to the source through funding to the CDC's Field Epidemiology Training Program.

In 2022, approximately **370 field epidemiologists**, or "disease detectives," were engaged in the program across **14 PMI partner countries**.

Some participants not only contributed to malaria surveillance and control but also provided critical assistance with investigations of other outbreaks, including—but not limited to—COVID-19, dengue, and Ebola.

In the long term, many of these trainees move into leadership positions in their respective countries.

In FY 2022, PMI supported **242 sites** monitoring insecticide resistance, **63 sites** monitoring parasite drug resistance, and **252 sites** monitoring mosquito behavior.

COUNTERING DRUG AND INSECTICIDE RESISTANCE WHILE BOLSTERING LAB AND SURVEILLANCE CAPACITY

Widespread use of artemisinin-based combination therapies (ACTs) has contributed to tremendous reductions in malaria cases and deaths over the past fifteen years. Today, these gains are threatened, as partial **resistance to artemisinin** has been confirmed in three countries in East Africa (Rwanda, Uganda, and Tanzania). Since 2014, PMI has brought malaria experts across Africa and the U.S. together to quickly identify emerging resistance and adapt treatment practices if necessary. Through this network, PMI is helping numerous laboratories in partner countries enrich their skills to independently monitor for antimalarial drug resistance, in collaboration with CDC's Malaria Lab in Atlanta. In 2022, the Bill & Melinda Gates Foundation and the CDC Foundation supported a PMI initiative that provides training to identify antimalarial resistance and conduct sample analysis at the Cheikh Anta Diop University of Dakar in Senegal. The new hub hosted trainees from two countries

PHOTO: *A scientist from Cameroon participating in training at Cheikh Anta Diop University in Senegal*
Photo credit: Irene Cavros, CDC

(Guinea and Cameroon) and plans to train scientists and analyze samples from two additional countries (Niger and the DRC) in 2023. PMI also supports local research institutions and universities in conducting therapeutic efficacy studies to monitor whether drugs remain effective in treating malaria parasites, and contributed to the development and drafting of the WHO strategy to respond to antimalarial drug resistance in Africa.

Insecticide resistance—a reduction in the ability of an insecticide to kill mosquitoes—has been detected in all 27 PMI partner countries. PMI continues to support monitoring, largely implemented by local institutions, of malaria-carrying mosquito populations to detect insecticide resistance among mosquitoes and ensure that the right tools are used to combat them. With PMI support, countries are expanding their surveillance capabilities to stay ahead of the ever-evolving mosquito. Côte d'Ivoire, for example, expanded its entomological surveillance sites from 18 to 32 districts in FY 2022. Mosquitoes in Africa are also developing resistance to standard pyrethroid insecticides, so new nets with additional chemicals are being used to provide protection in areas with pyrethroid resistance. In FY 2022, of all the nets provided by PMI to partner countries, more than 60 percent were the newer nets.

PHOTO: *A healthcare worker in Zambia conducts a RDT test on a child suspected to have malaria. Photo credit: Jennifer Somtore, PMI*

REMAINING VIGILANT TO ENSURE THE EFFECTIVENESS OF OUR TOOLS

Rapid diagnostic tests (RDTs) have transformed malaria control by providing a quick and reliable way to diagnose malaria even in remote locations and with only a few hours of training. However, parasites have evolved that evade detection by the most common type of RDT, which means a patient may not be correctly diagnosed and treated. While there is strong evidence of these parasites in the Horn of Africa, surveillance is needed elsewhere in Africa. Working in partnership with CDC's Malaria Branch laboratory and the Bill & Melinda Gates Foundation, PMI is supporting surveillance efforts in Angola, Benin, Madagascar, and Rwanda. PMI also supports procurement of alternative, more expensive tests in places where parasites evading the test are well documented, such as Ethiopia.

SOUNDING THE ALARM—an invasive mosquito threatens to undo progress against malaria in Africa: *Anopheles stephensi*, the main mosquito responsible for malaria in South Asia, has recently been detected in six countries in Africa.

Most malaria in Africa exists in rural environments but *An. stephensi* thrives in urban environments, which could transform the malaria landscape on the continent. **If the mosquito continues to spread, an additional 126 million people in rapidly urbanizing Africa could be at risk.** A PMI-supported study provided the first epidemiological evidence linking *An. stephensi* with increases in malaria in Ethiopia and also found that the mosquito is resistant to the insecticides most commonly used to control malaria in Africa. PMI-supported modeling found that in Ethiopia alone, mosquito control efforts would need to increase by an estimated $72 million dollars per year just to mitigate this invasive species.

PHOTO: *A property owner in Ethiopia observing the measurement of an* Anopheles stephensi *breeding habitat found in a tire. Photo credit: PMI VectorLink*

PMI's work in Ethiopia is helping to lead the world in collecting data and responding to the invasion:

Surveillance conducted in Ethiopia to understand *An. stephensi* behavior is being shared with the global community to allow for **early detection and rapid response to the mosquito in new locations.**

A pilot is underway to assess the effectiveness of adding larvicide (a chemical used to kill mosquito larvae but safe for humans) to the water where *An. stephensi* breed, targeting **79,000 residential properties in 8 towns.**

Training in mosquito collection and analysis is strengthening the region's capacity to distinguish *An. stephensi* from other types of mosquitoes.

PHOTO: A Community Vector Control Technician spraying a shallow pond with larvicide in Ethiopia.
Photo credit: Alemu Dugo, PMI VectorLink

ADDRESSING CLIMATE CHANGES THROUGH ADAPTIVE PLANNING AND CLEAN ENERGY APPROACHES—AND RESPONDING WHEN CRISES HIT

Warmer temperatures and more rain may provide the ideal conditions for mosquitoes to breed and for parasites to survive. By 2030, increased temperatures could put roughly 22–36 million additional people in Africa at risk from exposure to malaria.[7] PMI is working to make climate data, including on rainfall, more accessible to partner countries through both PMI data systems and country repositories. Countries can use the data alongside malaria patterns to determine optimal timing to deploy campaigns such as indoor residual spraying and malaria prevention medicines for children. In Madagascar and Tanzania, PMI is piloting the use of solar power to cool the storerooms where insecticides are stored and to charge mobile devices that track and manage indoor residual spraying campaigns, making malaria programs less susceptible to power outages while embracing cleaner energy. PMI also responds quickly to provide malaria services to countries that are affected by severe weather. When Tropical Cyclone Ana hit Malawi, for example, PMI supported the distribution of rapid malaria tests and malaria treatments to cyclone-affected areas and nearly 38,000 insecticide-treated nets to internally displaced people (IDPs).

Greening the commodity supply chain: PMI's supply chain activities reduced their greenhouse gas emissions by over **50 percent** and generated **$28.7 million** in cost savings from FY 2019 to FY 2021.

PMI **transitioned from primary reliance on air freight to using sea and land freight,** which generate fewer greenhouse gas emissions per ton-mile than air freight and are cheaper.

Through improved packaging and loading, PMI increased the number of units that can be loaded into a 40-foot container, further lowering carbon emissions.

PHOTO: *Malaria products being delivered in Malawi.*
Photo credit: GHSC-PSM

HELPING CONFLICT-AFFECTED PEOPLE STAY SAFE FROM MALARIA

Conflict makes it more difficult to deliver malaria prevention and treatment services due to breakdowns in health infrastructure, interruptions in supply chains, security challenges, and moving populations. By the end of 2020, nearly 21.8 million people across sub-Saharan Africa were IDPs as a result of conflict and violence,[8] the highest figure to date. PMI works with partner countries to make sure populations affected by conflict continue to have access to malaria prevention tools and treatment. During FY 2022, PMI Ethiopia trained community members to conduct indoor residual spraying in refugee camps and districts that contain IDPs, protecting over 725,000 people, and trained and equipped health workers to distribute 2.9 million insecticide-treated nets within their communities when conflict made travel dangerous and difficult. In the Democratic Republic of the Congo (DRC), PMI coordinates with humanitarian organizations to deliver malaria commodities to health zones in conflict areas and pre-positions a 6-month supply (instead of the conventional 3-month supply) of malaria commodities in areas where road conditions and high insecurity make access very difficult and sometimes impossible. ■

INVESTING LOCALLY

PHOTO: *Community members in Mali with certificates of recognition and prizes to celebrate their advocacy for, and completion of, antimalarial treatment for pregnant women. Photo credit: PMI Impact Malaria*

Local communities know best the challenges they face fighting malaria and what they need to beat the disease. PMI's approach from the start has been to work hand in hand with national malaria programs and other stakeholders, such as local civil society organizations, to design and implement malaria programs. Under PMI's current strategy and in alignment with USAID priorities, we are deliberately working to shift more leadership, decision-making, and implementation to local partners to ensure sustainable, effective, and equitable malaria services and stronger health systems over the long term.

To that end, PMI intends to progressively increase funding to local organizations through subawards and provide technical assistance to local partners with the goal of positioning local organizations to be future prime award recipients. For example, in 2022 PMI Tanzania made an $18 million, five-year award, subject to availability of funds, to its local partner the Ifakara Health Institute, which had previously been a subaward recipient, to support PMI's work in case management and the prevention of malaria in pregnancy.

PHOTO: *Spray operators in Malawi practice their indoor residual spray technique. Photo credit: Abdoulaye Bangoura, PMI VectorLink*

People are at the heart of PMI's work with partners around the world. By investing in people closest to those we serve, PMI is strengthening the capacity in our partner countries to lead and implement malaria programs. PMI trains and equips those working across the breadth of the health system, including community health workers, doctors, nurses, pharmacists, entomologists, laboratory technicians, supply chain logisticians, and social scientists. After seven years of working with partners in Zanzibar, PMI fully transitioned indoor residual spraying to the Ministry of Health's Zanzibar Malaria Elimination Programme in 2022, exemplifying how investing locally in people and programs enables countries to reach their goal of planning and implementing malaria services independently.

PMI also partners with research institutions in malaria endemic countries to develop knowledge about malaria and strengthen local capacity to find new tools and approaches to combat the disease. For example, PMI supports the Center for Research in Infectious Diseases in Cameroon, an institution that is conducting critical research to understand diseases such as malaria while training the next generation of scientists in Cameroon and other countries in Africa.

PHOTO: *An insecticide-treated net being delivered to a household in Angola. Photo credit: Alberto Zingany, PSI Angola*

PHOTO: *An IRS spray operator speaking with community members in Zambia. Photo credit: Yvonne Noombo, Zambia News and Information Services*

In addition, PMI is adjusting its procurement policies and leveraging its procurement volume to ensure a larger share of our purchases are medicines and other commodities made in Africa, shifting production closer to demand. Despite 95 percent of malaria cases and 96 percent of deaths occurring in sub-Saharan Africa, regional production of quality-assured malaria medicines is minimal. PMI efforts have led to an estimated 30 percent of PMI's 2023 standard mosquito net procurement being sourced from African-based manufacturers and to agreements with two African pharmaceutical manufacturers to procure antimalarial treatments. Efforts such as these support growth in the medical-manufacturing sector in Africa and a more resilient health system that can better absorb global supply chain disruptions. ■

LOCAL VOICES

PMI invests in people and partners closest to those we serve. These health heroes play a critical role in preventing, detecting, and treating malaria so that their communities can thrive.

Photo credit: GHSC-PSM

I am happy that I never have to turn back clients diagnosed with malaria. My facility is always resupplied with the needed malaria commodities; I am fulfilled as a health worker.

— *Gloria Samuel* is the officer in charge of Karyo Dispensary in a remote, hard-to-reach area of northwestern Nigeria. PMI trained Gloria to use a logistics system that helps her manage and order the malaria medicines needed to keep her community healthy.

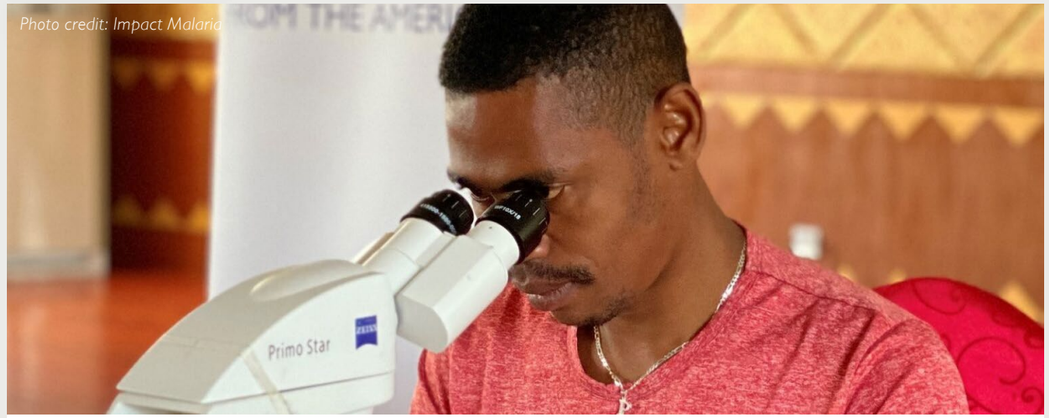


Photo credit: Impact Malaria

It is critical for a physician to know which type of malaria parasite is causing the disease to prescribe the correct treatment. I look forward to sharing my expertise with technicians all over the country and beyond.

— *Patrick Raharinandrasana* is a laboratory technician at a regional public health directorate in Madagascar. Patrick completed PMI-supported training to become a WHO-accredited malaria microscopist

LOCAL VOICES

Photo credit: Impact Malaria

I solve problems with my colleagues to offer quality and improved health service delivery to pregnant women who visit our facility. Now all pregnant women receive the proper prevention tools, such as nets and antimalarials.

— *Hagar Koomson* is a senior midwifery officer at the Effia Nkwanta Regional Hospital in Takoradi, Ghana.

Photo credit: PMI VectorLink

PMI engages community members in mosquito collection activities. Community members are trained to do the collections themselves. This has helped a lot with the community's understanding and acceptance of vector control interventions and a reduction in mosquito bites.

— *Mohamed Bayoh* is an entomologist whose work supports evidence-based campaign planning and implementation in Zambia.

LOCAL VOICES

Photo credit: Impact Malaria

I've spent years working on malaria intervention. This is my passion. I feel proud when I use my skills to save a life. I want to contribute and see Laos be malaria free.

— *Chansamone Yotvilay* is a technical officer in Champasak Province in Lao PDR. She uses the "1-3-7" approach in her work to report confirmed malaria cases in one day, investigate and classify the confirmed cases in three days, and follow up with necessary actions within seven days.

Photo credit: Dr. Fatuma Manzi, Ifakara Health Institute

We are identifying ways to ensure health workers are properly trained and have sufficient supervision to do their job well. This will help make great strides towards malaria control and elimination.

— *Yusufu Kionga* is a social scientist at the Ifakara Health Institute in Tanzania.

INNOVATING TO SAVE LIVES

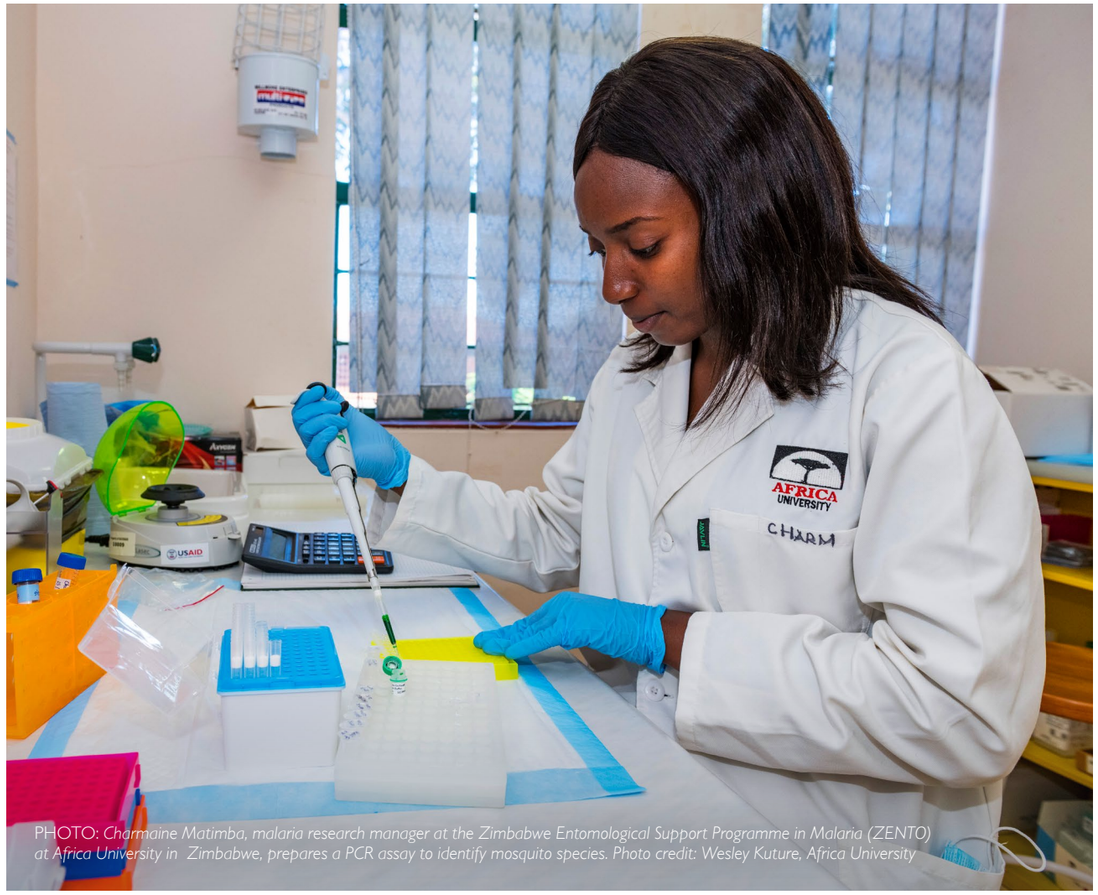


PHOTO: *Charmaine Matimba, malaria research manager at the Zimbabwe Entomological Support Programme in Malaria (ZENTO) at Africa University in Zimbabwe, prepares a PCR assay to identify mosquito species. Photo credit: Wesley Kuture, Africa University*

The key to driving towards malaria elimination is constant innovation and optimizing the use of existing tools to extend the reach and impact of malaria services in diverse environments. In FY 2022, USAID continued to advance the development of nonartemisinin-based medicines to combat drug resistance through investing in the Medicines for Malaria Venture, and funded the Innovative Vector Control Consortium to develop new insecticides and insecticide-based technologies.

Another way that PMI invests in innovation is through funding operational research studies to scale up new tools and improve current tools for greater impact. For example, PMI-supported studies in Benin and Malawi are helping develop a net durability test to make it easier to determine how well nets perform. One of the primary tools for malaria prevention, nets often last less than the expected three years due to physical degradation. PMI is working with partners, including the Nonwovens Innovation & Research Institute, the Innovative Vector Control Consortium, Innovation to Impact, and CDC's Entomology Branch in the Division of Parasitic

PHOTO: *Uganda Housing Modification study engineer Richard Kamya (far right), and local masons installing eave tubes in a village in Jinja District. Photo credit: Infectious Disease Research Collaboration, Uganda*

Diseases and Malaria, to help manufacturers optimize the nets they produce and enable PMI and other donors to identify the best products to use.

Operational research also tests the effectiveness of new tools and investigates the potential of long-existing tools to be applied in new contexts. PMI funded a pilot study that began in Uganda in 2021 to assess the feasibility of housing modifications to prevent mosquitoes from entering homes. The trial outcomes, expected in mid-2023, could have significant implications for malaria control and elimination and, if found effective, could reintroduce an important long-term and sustainable malaria intervention that was historically key to reducing malaria in the United States and Europe. A study in Burma assessing the impact of distributing topical repellents to forest workers showed that using the repellents can contribute to malaria prevention and elimination efforts among hard-to-reach populations, especially in situations where use of other tools that protect people from mosquitoes—such as insecticide-treated nets—is challenging. ■

ROLLING OUT THE WORLD'S FIRST MALARIA VACCINE: Following the historic WHO recommendation of the RTS,S/AS01 malaria vaccine in late 2021, PMI has worked with global and national partners to translate that recommendation into reality so that the children at risk can receive this lifesaving vaccine.

Working closely with international partners such as the WHO and Gavi in FY 2022, PMI helped develop an **expedited process for supporting countries to develop quality vaccine applications** and led the development of clear global guidance for introducing the malaria vaccine.

Gavi has approved the plans for continued malaria vaccine access in Ghana, Malawi, and Kenya, and will expand to support more countries this year.

USAID also continues to invest in new vaccine candidates to ensure there is a robust pipeline of malaria vaccines to prevent infection and save lives.

LEVERAGING PARTNERSHIPS TO END MALARIA FASTER

PHOTO: *Community health volunteers on the front line of the fight against malaria in Madagascar. Photo credit: Rajo Andriambeloson, MSH*

Malaria remains a U.S. foreign assistance priority and a critical component of the U.S. government's global health efforts. Success against malaria depends on strong partnerships between the U.S. government and international governments, international organizations, the private sector, and local civil society and faith organizations. Given the growing population at risk for malaria, new threats to progress against the disease, and the impact of the current economic environment worldwide on global funding for malaria response, leveraging partnerships is crucial for extending malaria services and forging towards elimination.

Developing robust partnerships across all sectors of society is essential for accelerating the fight against malaria. With collaboration from PMI, Zambia established its innovative End Malaria Council, convening senior government, business, and community leaders to mobilize domestic resources and keep malaria elimination high on public- and private-sector agendas. With PMI advocacy and advice, the Rotary Club in Zambia is supporting the training of health facility staff and providing training and supplies to community health workers, with the

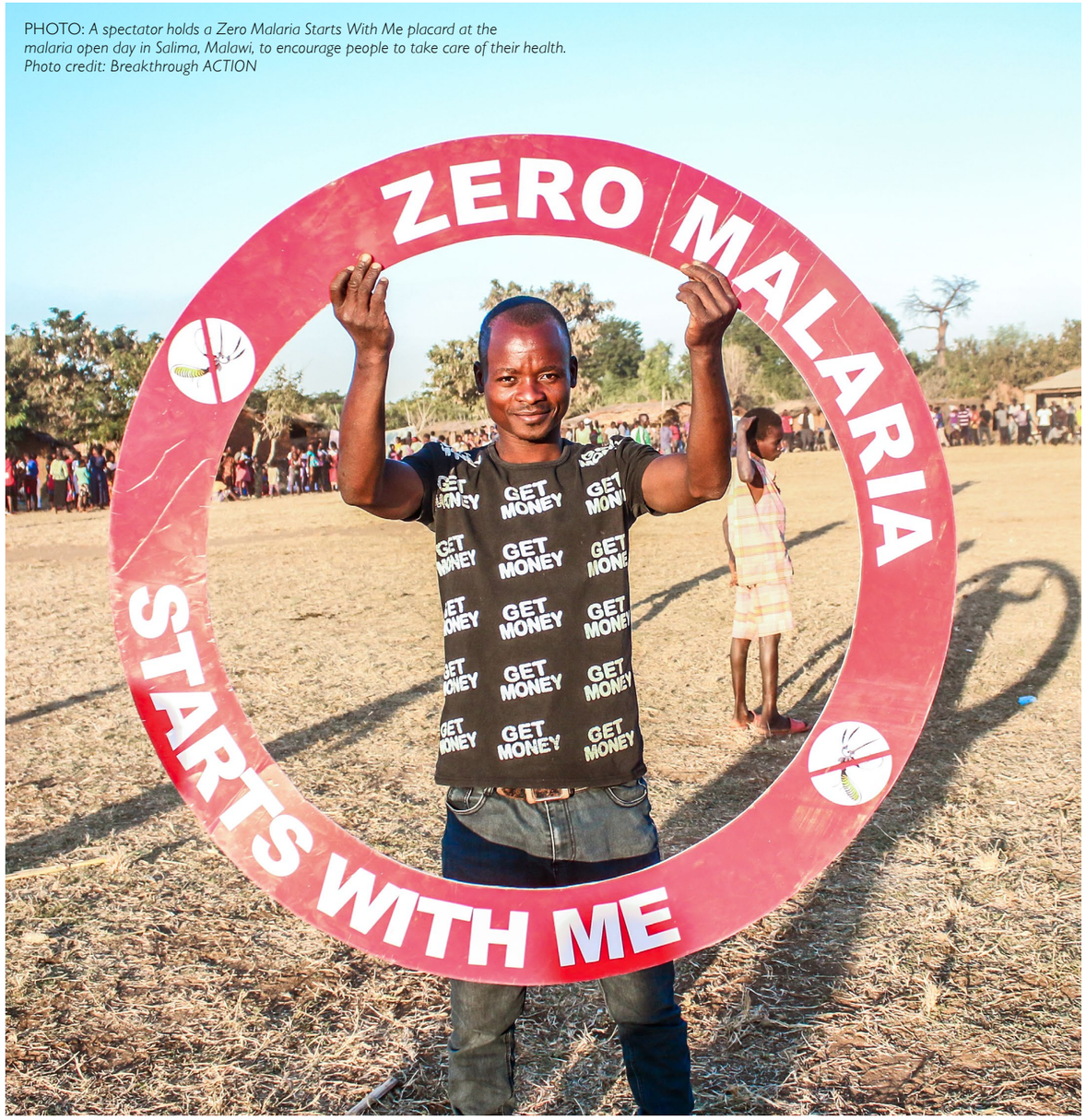


PHOTO: *A spectator holds a Zero Malaria Starts With Me placard at the malaria open day in Salima, Malawi, to encourage people to take care of their health. Photo credit: Breakthrough ACTION*

aim of increasing access to malaria diagnosis and treatment for more than 1.3 million people. The Rotary Foundation's $2 million grant to support these efforts was matched by the Bill & Melinda Gates Foundation and World Vision for a total of $6 million.

Engaging the private sector is critical for bridging the global malaria funding gap. In 2021, PMI signed a five-year memorandum of understanding with Nigeria LNG (NLNG) Limited, a global producer of natural gas, with the aim of making Bonny Island, where the gas producer has a facility, Nigeria's first malaria-free zone. In 2022, PMI provided 273,500 insecticide-treated nets for distribution to communities on the island; NLNG funded the net distribution campaign. PMI is also providing technical assistance to help the Bonny Malaria Elimination Project optimally deploy its malaria programs. ■

A LIFESAVING PARTNERSHIP WITH THE GLOBAL FUND TO FIGHT AIDS, TUBERCULOSIS AND MALARIA: President Biden hosted the Global Fund's Seventh Replenishment Conference in 2022, which resulted in total pledges of **$15.7 billion** from numerous donors to fight AIDS, tuberculosis, and malaria over the next three years—the largest replenishment in the history of the Global Fund.

Through close collaboration, PMI and the Global Fund **maximize the cost-effectiveness and impact of investments in malaria.**

PMI's on-the-ground technical assistance complements and leverages the Global Fund's investments, making sure **insecticide-treated nets and medicines reach more people and save more lives.**

For example, in FY 2022 PMI and the Global Fund together provided Mozambique with around **24 million** rapid diagnostic tests (RDTs) and **12.5 million** artemisinin-based combination therapies (ACTs) treatments.

PMI then **supported the delivery of kits containing the tests and treatments** to supply community health workers throughout the country.

STRIVING FOR A WORLD WITHOUT MALARIA

PHOTO: *Esther Ometi received a long lasting insecticide-treated net when she brought her baby for immunization at a hospital in Homabay County in Kenya. Photo credit: Afya Ugavi*

A world without malaria is PMI's driving vision, and one that is achievable. Globally, between 2000 and 2021, the number of countries with fewer than 10 indigenous cases increased from 4 to 25. Countries in the Greater Mekong Subregion are entering the last mile towards elimination. Eradicating malaria can be done.

No child should die from a mosquito bite. Investing in the fight to end malaria is not only the right thing to do—with the chance to save millions of lives and unlock untapped human potential—it is also the smart thing to do. Every $1 invested in malaria control returns $19 in economic growth,[9] enhances countries' stability, prosperity, and prospects as trading partners, and advances global health security.

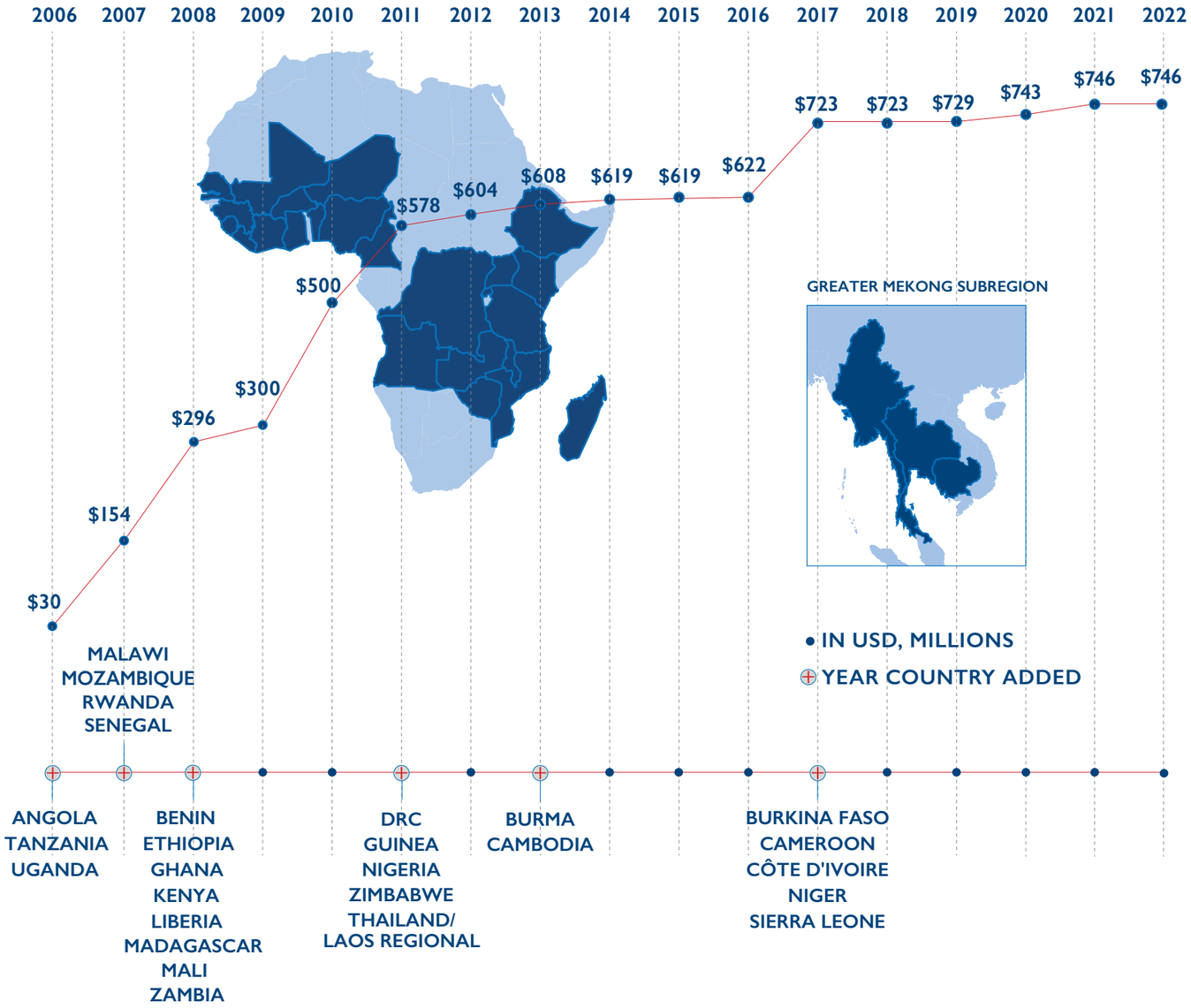
It is going to take unwavering commitment, leveraging all available resources, and broad global cooperation to end malaria. The world is constantly developing new knowledge and better tools to make malaria a disease of the past. We must redouble our efforts and finish this fight. ■

ANNEX 1

COUNTRY INVESTMENTS MADE BY THE U.S. PRESIDENT'S MALARIA INITIATIVE

Reducing malaria enables countries to unlock economic growth and realize greater human potential, paving their path out of poverty and fostering more productive partnerships with the United States. Thanks to the bipartisan support of Congress and the generosity of the American people, PMI invested $746 million across its partner countries in FY 2022.

(1) This graphic has investments rounded to the nearest million and does not include funding programmed for malaria beyond PMI's partner countries. (2) $25 million plus-up funds include $22 million allocated to 15 PMI focus countries ($19.2 million for Round 2 countries and $2.8 million for jump starts in Round 3 countries). In FY 2005, USAID provided a total of $4,250,775 in jump-start funds to Angola ($1,740,000), Tanzania ($2 million), and Uganda ($510,775). (3) In FY 2006, USAID also provided a total of $35,554,000 in jump-start funds to Benin ($1,774,000), Ethiopia ($2,563,000), Ghana ($1,478,000), Kenya ($5,470,000), Madagascar ($2,169,000), Malawi ($2,045,000), Mali ($2,490,000), Mozambique ($6,259,000), Rwanda ($1,479,000), Senegal ($2,168,000), and Zambia ($7,659,000). (4) In FY 2007, USAID also provided a total of $42,820,000 in jump-start funds to Benin ($3,600,000), Ethiopia ($6,700,000), Ghana ($5 million), Kenya ($6,050,000), Liberia ($2,500,000), Madagascar ($5 million), Mali ($4,500,000), and Zambia ($9,470,000). (5) Levels in FY 2008 after USAID 0.81 percent rescission. (6) In FY 2010, USAID also provided a total of $36 million in jump-start funding to the DRC ($18 million) and Nigeria ($18 million), and provided funding for malaria activities in Burkina Faso ($6 million), Burundi ($6 million), Pakistan ($5 million), South Sudan ($4.5 million), the Amazon Malaria Initiative ($5 million), and the Mekong Malaria Programme ($6 million). (7) In FY 2011, USAID also provided funding for malaria activities in Burkina Faso ($5,988,000), Burundi ($5,988,000), South Sudan ($4,491,000), and the Amazon Malaria Initiative ($4,990,000). (8) In FY 2012, USAID also provided funding for malaria activities in Burkina Faso ($9 million), Burundi ($8 million), South Sudan ($6,300,000), and the Amazon Malaria Initiative ($4 million). (9) In FY 2013, USAID also provided funding for malaria activities in Burkina Faso ($9,421,000), Burundi ($9,229,000), South Sudan ($6,947,000), and the Amazon Malaria Initiative ($3,521,000). (10) Starting in FY 2011, PMI funding to the Greater Mekong Subregion was programmed through the Mekong Regional Program (Burma, Cambodia, Lao PDR, and Thailand). With FY 2013 funding, PMI began supporting activities in Burma and Cambodia directly. In addition, PMI continued to provide FY 2013 funding to the Mekong Regional Program (Lao PDR and Thailand) for activities in the region outside the PMI Burma and PMI Cambodia bilateral programs. (11) In FY 2014, USAID also provided funding for malaria activities in Burkina Faso ($9,500,000), Burundi ($9,500,000), South Sudan ($6,000,000), and the Amazon Malaria Initiative ($3,500,000). (12) In FY 2015, USAID also provided funding for malaria activities in Burkina Faso ($12 million), Burundi ($12 million), South Sudan ($6 million), and Latin America and the Caribbean region ($3,500,000). (13) In FY 2016, USAID also provided funding for malaria activities in Burkina Faso ($14 million), Burundi ($9,500,000), South Sudan ($6 million), and Latin America and the Caribbean region ($5 million). (14) In FY 2017, USAID also provided funding for malaria activities in Burundi ($9 million) and Latin America and the Caribbean region ($5 million). (15) In FY 2018, USAID also provided funding for malaria activities in Burundi ($9 million) and Latin America and the Caribbean region ($5 million). (16) In FY 2019, USAID also provided funding for malaria activities in Burundi ($8 million) and Latin America and the Caribbean region ($5 million). (17) In FY 2020, USAID also provided funding for malaria activities in Burundi ($8 million) and Latin America and the Caribbean region ($5 million). (18) In FY 2021, USAID also provided funding for malaria activities in Burundi ($7.5 million) and Latin America and the Caribbean region ($5 million). Please refer to the funding table for more information.



FUNDING FOR THE U.S. PRESIDENT'S MALARIA INITIATIVE

	PMI Funding Start	FY 2022 ($ million)	All Years ($ Million)
ANGOLA	2006	19	396
BENIN	2008	17	251
BURKINA FASO	2017	26	155
BURMA	2013	10	94
CAMBODIA	2013	10	79
CAMEROON	2017	23.5	135
CÔTE D'IVOIRE	2017	25	150
DRC	2011	54.5	579
ETHIOPIA	2008	36	544
GHANA	2008	28	411
GUINEA	2011	17	165
KENYA	2008	33.5	497
LIBERIA	2008	15	203
MADAGASCAR	2008	26	383
MALAWI	2007	24	364
MALI	2008	25	364
MOZAMBIQUE	2007	29	445
NIGER	2017	20	111
NIGERIA	2011	73	841
RWANDA	2007	19	292
SENEGAL	2007	24	365
SIERRA LEONE	2017	16	92
TANZANIA	2006	44	703
THAILAND/LAOS	2011	3	56
UGANDA	2006	34	515
ZAMBIA	2008	30	382
ZIMBABWE	2011	15	176
HEADQUARTERS	2006	49.9	592
TOTAL	—	**746**	**9,339**

Cumulative ("all years") funding numbers and overall totals have been rounded to the nearest million. In FY 2022, USAID also provided funding for malaria activities in Burundi ($11 million) and Latin America and the Caribbean region ($5 million). In addition, the U.S. government is the largest donor to the Global Fund to Fight AIDS, Tuberculosis, and Malaria (Global Fund). The Global Fund was the other leading source of donor funding for country malaria programs over the same period. *Burkina Faso also received $66 million in USAID funding for malaria activities between 2010 and 2016.

ANNEX II

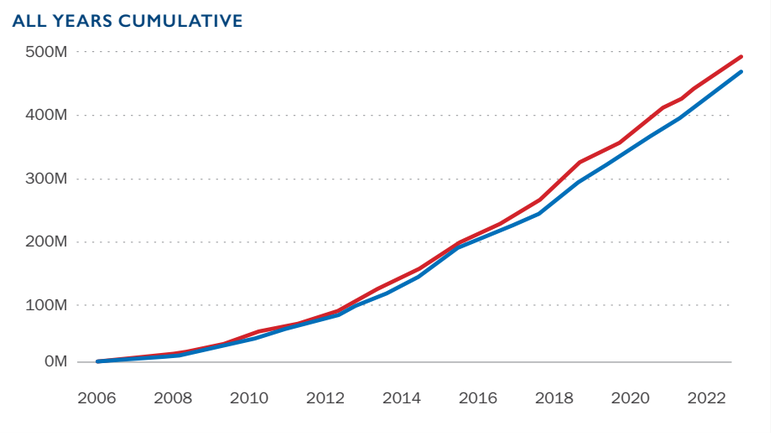
U.S. PRESIDENT'S MALARIA INITIATIVE COMMODITY AND TRAINING INVESTMENTS

PHOTO: *An education session on insecticide-treated net use in Rakhine State, Burma. Photo credit: URC/Defeat Malaria*

- The reporting timeframe is the 2022 federal fiscal year (FY), which ran from October 1, 2021, to September 30, 2022.
- PMI counts commodities as "procured" once the procurement service agent has released a purchase order or invoice for those commodities. PMI reports commodities as "delivered" once PMI receives proof of delivery to the partner country.
- Intervention packages are tailored and depend on many factors, including demographics, national policies, climate, resistance patterns, mosquito/parasite type, and available contributions by partner governments and other donors. PMI only delivers commodities where they are recommended and needed. Therefore, commodities and training provided will differ by country and from year to year. PMI works closely with national malaria programs and other donors to optimize coordination and avoid duplications or gaps.
- Procurements and deliveries may be listed as "zero" because they occurred just outside (before or after) the fiscal year. Differences between these numbers are also expected because of factors such as production timelines, shipping duration, stocks held temporarily in reserve before delivery, and other factors.

INSECTICIDE-TREATED NETS (ITNs)

ITNs kill mosquitoes that land on them and physically block mosquitoes at night when they are most likely to bite. PMI maintains ITN coverage through a combination of mass distribution campaigns and continuous distribution via health clinics, schools, and other channels.



FY 2022 HIGHLIGHTS:

45,373,217
ITNs Procured

50,667,965
ITNs Delivered

ALL YEARS CUMULATIVE

495,593,046
ITNs Procured

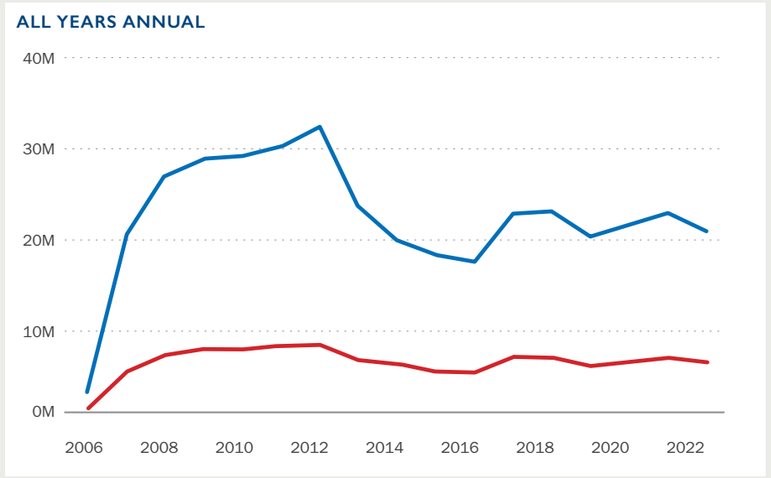
472,511,298
ITNs Delivered

Notes: This table reports the number of ITNs procured and delivered with PMI funding. In some cases (due to lead time, etc.), ITNs procured in a given fiscal year are not delivered until the subsequent one. In addition, PMI coordinates with other donors to distribute commodities purchased with non-PMI resources. During FY 2022, PMI also provided support for ITN activities in Colombia and Burundi. In Colombia, 3,000 ITNs were procured. In Burundi, 730,335 ITNs were procured and 836,804 ITNs were delivered.

	ITNs Procured	ITNs Delivered
ANGOLA	-	3,453,800
BENIN	1,157,103	550,000
BURKINA FASO	1,286,550	1,979,227
BURMA	250,000	-
CAMEROON	153,552	500,594
CÔTE D'IVOIRE	172,304	346,374
DRC	3,046,800	1,594,383
ETHIOPIA	5,956,289	2,965,684
GHANA	1,343,040	2,391,865
GUINEA	3,345,550	3,580,450
KENYA	2,187,253	2,926,829
LIBERIA	300,000	279,000
MADAGASCAR	1,300,000	1,300,000
MALAWI	993,150	660,000
MALI	1,864,000	1,864,000
NIGER	302,500	402,500
NIGERIA	8,187,719	13,446,620
RWANDA	3,368,785	3,809,348
SENEGAL	-	1,832,845
SIERRA LEONE	738,696	333,000
TANZANIA	2,967,583	3,235,605
THAILAND/LAOS	150,300	270,314
UGANDA	5,002,043	1,600,527
ZAMBIA	600,000	-
ZIMBABWE	700,000	1,345,000

INDOOR RESIDUAL SPRAYING (IRS)

IRS treats the inside walls of homes with long-lasting insecticides. It is an effective way to kill mosquitoes and disrupt the transmission of malaria.



FY 2022 HIGHLIGHTS:

5,267,327
Houses Sprayed

19,235,377
Residents Protected

28,359
IRS Spray Personnel Trained

ALL YEARS ANNUAL

Houses Sprayed

Residents Protected

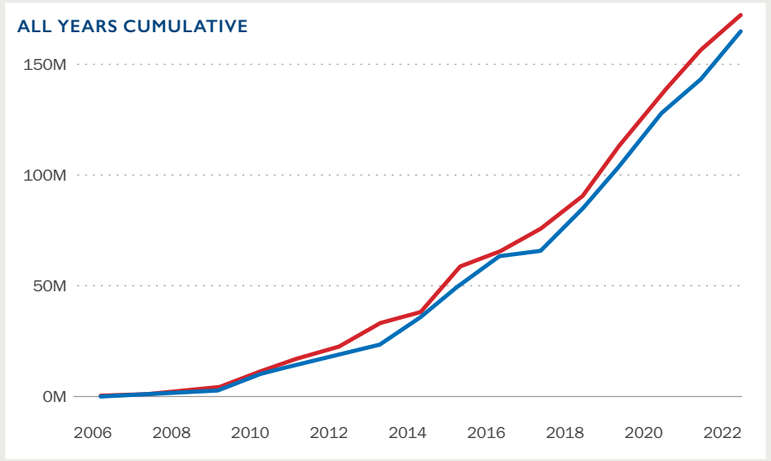
Notes: PMI defines "spray personnel" as spray operators, supervisors, and ancillary personnel. It does not include the many people trained to conduct information and community-mobilization programs for IRS campaigns.

PMI also offers technical assistance to non-PMI IRS campaigns.

	IRS Houses Sprayed	IRS Residents Protected
CÔTE D'IVOIRE	70,392	228,432
ETHIOPIA	684,490	1,792,345
GHANA	355,940	961,413
KENYA	413,985	1,614,938
MADAGASCAR	213,922	885,814
MALAWI	120,097	481,075
MALI	72,106	273,831
MOZAMBIQUE	309,547	1,408,179
RWANDA	354,669	1,358,152
SENEGA	138,752	570,283
SIERRA LEONE	143,509	652,232
TANZANIA	568,484	2,081,886
UGANDA	1,104,083	3,894,239
ZAMBIA	717,351	3,032,558

INTERMITTENT PREVENTIVE TREATMENT IN PREGNANCY (IPTp)

Malaria is dangerous for pregnant women and their babies. Ensuring that women receive IPTp at prenatal visits after the first trimester can prevent malaria. Ideally, women receive at least three doses.



FY 2022 HIGHLIGHTS:

15,777,466
IPTp Doses Procured

21,553,333
IPTp Doses Delivered

22,324
Health Workers Trained in IPTp Use

ALL YEARS CUMULATIVE

172,887,559
IPTp Doses Procured

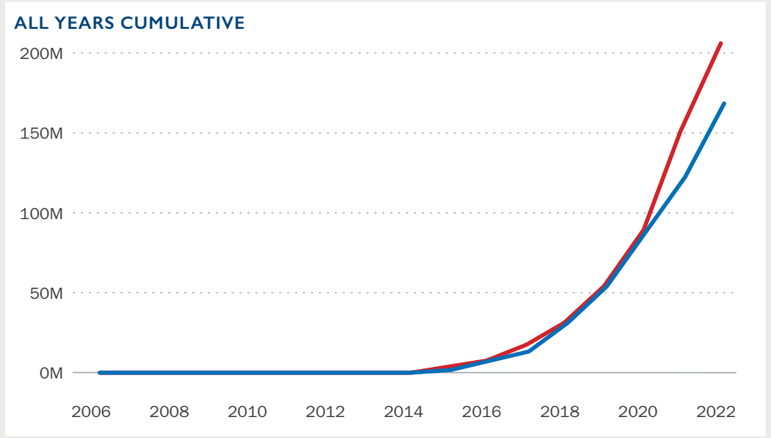
165,744,226
IPTp Doses Delivered

Notes: This table reports the number of IPTp doses purchased and delivered with PMI funding. In some cases (due to lead time, etc.), Doses procured in a given fiscal year are not delivered until the subsequent one. Each dose comprises three sulfadoxine-pyrimethamine tablets. PMI also funds the provision and promotion of ITNs, as well as the prompt diagnosis and appropriate treatment of malaria and anemia as part of a multipronged approach to preventing malaria in pregnancy.

	IPTp Doses Procured	IPTp Doses Delivered
ANGOLA	636,000	-
BENIN	1,030,000	1,165,000
CAMEROON	1,364,300	2,006,350
DRC	6,506,300	8,067,250
GHANA	-	970,000
LIBERIA	726,133	653,333
MADAGASCAR	1,000,000	2,150,000
MALAW	2,500,000	2,100,000
MALI	300,000	1,426,667
NIGER	-	1,000,000
ZAMBIA	1,543,333	1,543,333
ZIMBABWE	171,400	471,400

SEASONAL MALARIA CHEMOPREVENTION (SMC)

SMC is a monthly preventive treatment given to children under five years of age that protects them from contracting malaria during peak transmission season.



	SMC Doses Procured	SMC Doses Delivered
BENIN	580,000	580,000
BURKINA FASO	-	4,254,150
CAMEROON	9,807,700	9,180,050
GHANA	-	2,795,300
MALI	8,596,900	9,300,050
NIGER	6,200,050	6,014,250
NIGERIA	23,001,850	11,501,850
SENEGAL	6,551,050	4,515,450

FY 2022 HIGHLIGHTS:

54,737,550
SMC Doses Procured

48,141,100
SMC Doses Delivered

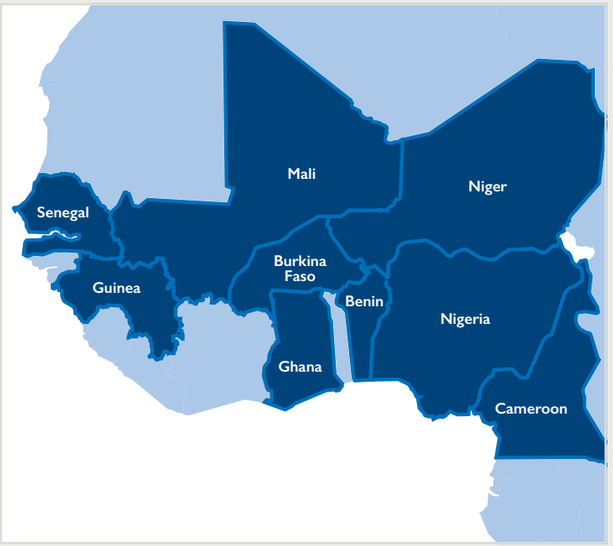
49,790
Health Workers Trained in SMC

ALL YEARS CUMULATIVE

214,861,171
SMC Doses Procured

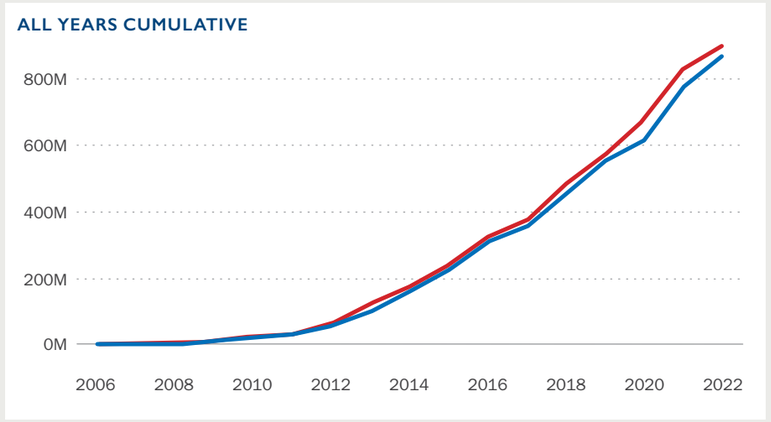
175,688,621
SMC Doses Delivered

Notes: SMC is only recommended in certain geographic regions. PMI funds SMC in all eligible countries it supports, shown in the map below. On average, four cycles of treatment are recommended per child. (A cycle consists of a treatment dose given once every 28 days during the rainy season.) In some cases (due to lead time, etc.), SMC commodities procured in a given fiscal year are not delivered until the subsequent one.



RAPID DIAGNOSTIC TESTS (RDTs)

RDTs are a quick, easy, and inexpensive way to test a suspected malaria case. As other common diseases can cause symptoms similar to those for malaria, testing helps ensure patients get the right diagnosis.



FY 2022 HIGHLIGHTS:

74,946,525
RDTs Procured

94,933,950
RDTs Delivered

33,818
Health Workers Trained in Malaria diagnosis
(RDTs and/or microscopy)

ALL YEARS CUMULATIVE

893,315,680
RDTs Procured

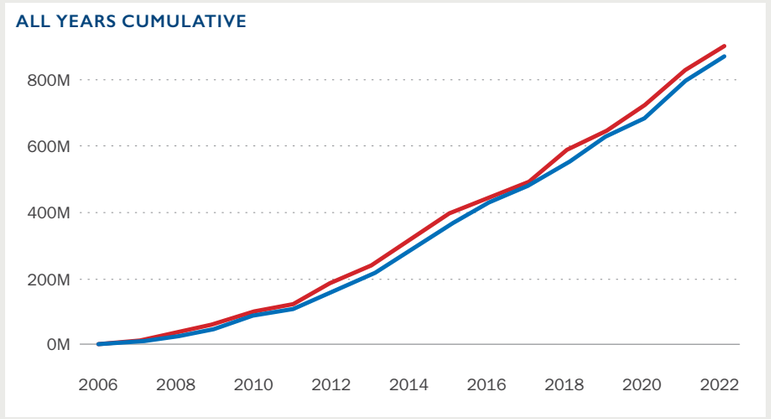
861,115,055
RDTs Delivered

Notes: In some cases (due to lead time etc.), RDTs procured in a given fiscal year are not delivered until the subsequent one. During FY2022, PMI also provided support for case management activities in Burundi, procuring and delivering 1,692,250 RDTs.

	RDTs Procured	RDTs Delivered
ANGOLA	9,600,000	3,500,000
BENIN	-	2,000,000
BURKINA FASO	7,000,000	8,000,000
BURMA	100,000	-
CAMBODIA	-	183,200
CAMEROON	799,625	1,930,550
CÔTE D'IVOIRE	1,000,000	1,931,975
DRC	-	12,215,500
GHANA	-	2,500,000
KENYA	8,700,000	3,700,000
LIBERIA	750,000	1,500,000
MADAGASCAR	2,000,000	7,876,125
MALAWI	11,000,000	8,075,000
MALI	5,500,000	4,500,000
MOZAMBIQUE	9,298,925	6,014,425
NIGER	1,458,625	2,919,250
NIGERIA	3,849,350	11,835,425
SENEGAL	-	2,500,000
SIERRA LEONE	1,400,000	-
THAILAND/LAOS	-	12,500
UGANDA	2,500,000	3,750,000
ZAMBIA	8,025,000	8,025,000
ZIMBABWE	1,965,000	1,965,000

ARTEMISININ-BASED COMBINATION THERAPIES (ACTs)

ACTs are the best medicine available for treating the most common form of malaria. Patients are typically cured after a three-day course.



FY 2022 HIGHLIGHTS:

74,957,525
ACTs Procured

79,565,055
ACTs Delivered

42,410
Health Workers Trained in Malaria Case Management

ALL YEARS CUMULATIVE

936,919,006
ACTs Procured

907,972,390
ACTs Delivered

Notes: This table reports the number of ACTs purchased and delivered with PMI funding. In some cases (due to lead time, etc.), ACTs procured in a given fiscal year are not delivered until the subsequent one. In addition, PMI coordinates with other donors to distribute commodities purchased with non-PMI resources. During FY 2022, PMI also provided support for case management activities in Burundi, procuring 1,027,620 ACTs and delivering 727,620 ACTs.

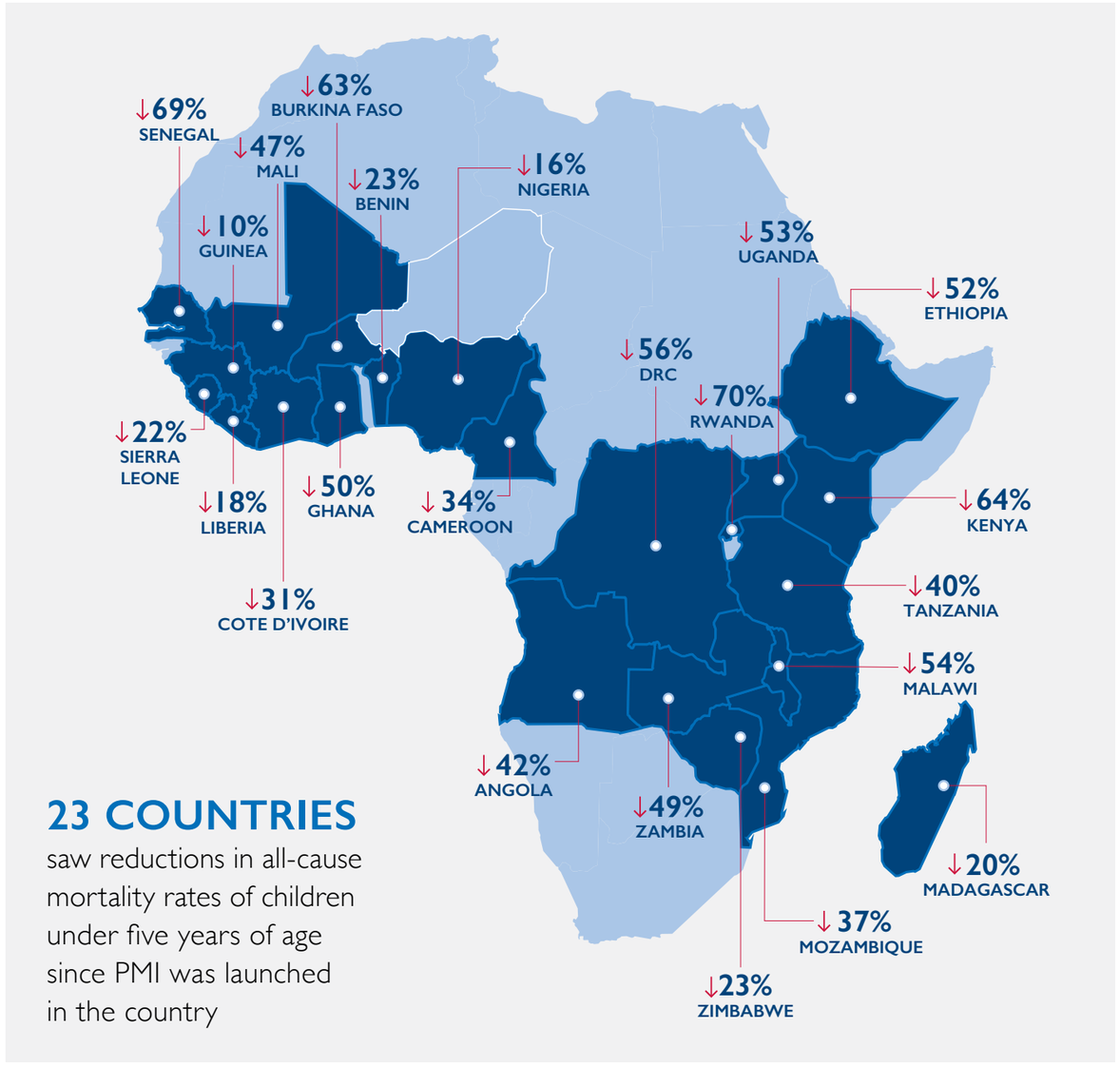
	ACTs Procured	ACTs Delivered
ANGOLA	3,334,100	3,520,750
BENIN	3,631,890	2,000,010
BURKINA FASO	8,247,910	5,999,910
CAMEROON	1,376,250	2,085,600
CÔTE D'IVOIRE	582,000	582,000
DRC	5,400,330	14,280,720
ETHIOPIA	-	537,300
KENYA	-	3,939,990
LIBERIA	1,507,350	923,610
MADAGASCAR	2,765,870	3,261,000
MALAWI	4,000,020	6,160,020
MALI	2,169,000	4,165,860
MOZAMBIQUE	13,572,270	9,994,830
NIGER	2,066,010	2,066,010
NIGERIA	13,532,070	6,004,830
RWANDA	-	713,040
SENEGAL	686,510	500,000
SIERRA LEONE	950,010	950,510
TANZANIA	1,450,830	2,459,010
UGANDA	1,418,370	1,017,870
ZAMBIA	7,447,650	7,478,700
ZIMBABWE	819,085	923,485

PHOTO: *A mother receiving a mosquito net at a health center in Rwanda. Photo credit: GHSC-PSM Rwanda*

ANNEX III

ALL-CAUSE MORTALITY RATES AND INTERVENTION COVERAGE IN U.S. PRESIDENT'S MALARIA INITIATIVE PARTNER COUNTRIES

- Data in this annex include a baseline survey for each indicator from before PMI began working in each country and the most recent comparable endline survey available.
- Two surveys are not yet available for all indicators for newer PMI partner countries.
- For more information on survey data, visit the Demographic and Health Surveys Program website and the United Nations Children's Fund Multiple Indicator Cluster Surveys website.



23 COUNTRIES

saw reductions in all-cause mortality rates of children under five years of age since PMI was launched in the country

Note: The 23 countries highlighted in blue have at least two data points from nationwide household surveys that measured all-cause mortality in children under the age of five. Niger is outlined in white but was not included as a data point, as it does not yet have two comparable household surveys available. For more detail on all-cause death rates in children under age five in PMI partner countries, the PMI baseline and the most recent survey, see the following page.

ALL-CAUSE DEATH RATES IN CHILDREN UNDER AGE FIVE (U5) IN PMI PARTNER COUNTRIES

COUNTRY	SURVEY	DEATHS PER 1,000 LIVE BIRTHS
ANGOLA	MIS 2011	118
	DHS 2015-2016	68
BENIN	DHS 2006	125
	DHS 2017	96
BURKINA FASO	DHS 2010	129
	DHS 2021 KIR	48
CAMEROON	DHS 2011	122
	DHS 2018	80
CÔTE D'IVOIRE	DHS 2011-2012	108
	DHS 2021 KIR	74
DRC	MICS 2010	158
	MICS 2018	70
ETHIOPIA	DHS 2005	123
	DHS 2019	59
GHANA	MICS 2006	111
	MICS 2017-2018	56
GUINEA	DHS 2012	123
	DHS 2018	111
KENYA	DHS 2003	115
	DHS 2022 KIR	41
LIBERIA	MIS 2009	114
	DHS 2019-2020	93
MADAGASCAR	DHS 2003-2004	94
	DHS 2021	75

COUNTRY	SURVEY	DEATHS PER 1,000 LIVE BIRTHS
MALAWI	MICS 2006	122
	MICS 2019-2020	56
MALI	DHS 2006	191
	DHS 2018	101
MOZAMBIQUE	DHS 2003	153
	DHS 2011	97
NIGER	DHS 2012	127
NIGERIA	DHS 2008	157
	DHS 2018	132
RWANDA	DHS 2005	152
	DHS 2019-2020	45
SENEGAL	DHS 2005	121
	cDHS 2019	37
SIERRA LEONE	DHS 2013	156
	DHS 2019	122
TANZANIA	DHS 2004-2005	112
	DHS 2015-2016	67
UGANDA	DHS 2006	137
	DHS 2016	64
ZAMBIA	DHS 2007	119
	DHS 2018	61
ZIMBABWE	DHS 2010-2011	84
	MICS 2019	65

OWNERSHIP OF INSECTICIDE TREATED NETS (ITNs) IN PMI COUNTRIES

COUNTRY	SURVEY	ITN OWNERSHIP (%)
ANGOLA	MIS 2006-2007 DHS 2015-2016	11 31
BENIN	DHS 2006 DHS 2017	25 92
BURKINA FASO	DHS 2010 DHS 2021 KIR	57 83
CAMEROON	DHS 2011 DHS 2018	36 73
CÔTE D'IVOIRE	DHS 2011-2012 DHS 2021 KIR	68 72
DRC	MICS 2010 MICS 2018	51 63
ETHIOPIA	MIS 2007 MIS 2015-2016	65 64
GHANA	MICS 2006 MIS 2019	19 74
GUINEA	MICS 2007 MIS 2021	8 63
KENYA	MIS 2007 MIS 2022 KIR	48 54
LIBERIA	MIS 2009 MIS 2022 KIR	47 72
MADAGASCAR	DHS 2008-2009 DHS 2021	57 69
MALAWI	MICS 2006 MICS 2019-2020	38 74
MALI	DHS 2006 MIS 2021	50 91
MOZAMBIQUE	MIS 2007 MIS 2018	16 82
NIGER	DHS 2012 MIS 2021 KIR	61 96
NIGERIA	MIS 2010 MIS 2021	42 56
RWANDA	DHS 2005 DHS 2019-2020	15 66
SENEGAL	MIS 2006 MIS 2020-2021	36 75
SIERRA LEONE	MIS 2016 DHS 2019	60 68
TANZANIA	DHS 2004-2005 MIS 2017	23 78
UGANDA	DHS 2006 MIS 2018-2019	16 83
ZAMBIA	MIS 2006 MIS 2021	38 53
ZIMBABWE	DHS 2010-2011 MICS 2019	29 37

"Ownership" is defined as the percentage of households that own at least one ITN.

ACCESS TO ITNs IN PMI COUNTRIES

COUNTRY	SURVEY	ITN ACCESS (%)
ANGOLA	MIS 2006-2007 DHS 2015-2016	15 20
BENIN	DHS 2006 DHS 2017	15 77
BURKINA FASO	DHS 2010 MIS 2017-2018	36 55
CAMEROON	MICS 2014 DHS 2018	56 59
CÔTE D'IVOIRE	MICS 2016	64
DRC	MICS 2010 MICS 2018	30 44
ETHIOPIA	DHS 2005 MIS 2015-2016	2 49
GHANA	DHS 2003 MIS 2019	2 67
GUINEA	DHS 2005 MIS 2021	2 42
KENYA	DHS 2008 MIS 2020	42 40
LIBERIA	MIS 2009 MIS 2022 KIR	25 52
MADAGASCAR	DHS 2008-2009 DHS 2021	35 48
MALAWI	DHS 2004 MICS 2019-2020	19 57
MALI	DHS 2006 MIS 2021	30 72
MOZAMBIQUE	DHS 2011 MIS 2018	37 69
NIGER	DHS 2012 MIS 2021 KIR	37 80
NIGERIA	MIS 2010 MIS 2021	29 43
RWANDA	DHS 2005 DHS 2019-2020	9 51
SENEGAL	MIS 2006 MIS 2020-2021	18 58
SIERRA LEONE	MIS 2016 DHS 2019	37 47
TANZANIA	DHS 2004-2005 MIS 2017	16 63
UGANDA	DHS 2006 MIS 2018	9 72
ZAMBIA	DHS 2007 MIS 2018	34 67
ZIMBABWE	DHS 2010-2011 MICS 2019	20 27

"Access" is defined as the percentage of the population who could sleep under an ITN if each ITN in the household were used by up to two people.

USE OF ITNs IN PMI COUNTRIES—CHILDREN UNDER AGE FIVE

COUNTRY	SURVEY	U5 ITN USE (%)
ANGOLA	MIS 2006-2007 DHS 2015-2016	18 22
BENIN	DHS 2006 DHS 2017	20 78
BURKINA FASO	DHS 2010 DHS 2021 KIR	47 67
CAMEROON	DHS 2011 DHS 2018	21 60
CÔTE D'IVOIRE	DHS 2011-2012 DHS 2021 KIR	37 59
DRC	MICS 2010 MICS 2018	38 51
ETHIOPIA	MIS 2007 MIS 2015-2016	41 45
GHANA	MICS 2006 MIS 2019	22 54
GUINEA	MICS 2007 MIS 2021	5 38
KENYA	MIS 2007 MIS 2022 KIR	39 51
LIBERIA	MIS 2009 MIS 2022 KIR	26 50
MADAGASCAR	DHS 2008-2009 DHS 2021	46 56

COUNTRY	SURVEY	U5 ITN USE (%)
MALAWI	MICS 2006 MICS 2019-2020	25 68
MALI	DHS 2006 MIS 2021	27 73
MOZAMBIQUE	MIS 2007 MIS 2018	7 73
NIGER	DHS 2012 MIS 2021 KIR	20 86
NIGERIA	MIS 2010 MIS 2021	29 41
RWANDA	DHS 2005 DHS 2019-2020	13 56
SENEGAL	MIS 2006 MIS 2020-2021	16 47
SIERRA LEONE	MIS 2016 DHS 2019	44 59
TANZANIA	DHS 2004-2005 MIS 2017	16 55
UGANDA	DHS 2006 MIS 2018	10 60
ZAMBIA	MIS 2006 MIS 2021	24 46
ZIMBABWE	DHS 2010-2011 MICS 2019	10 15

"Use" is defined as the percentage of children under age five who slept under an ITN the night before the survey.

USE OF ITNs IN PMI COUNTRIES—PREGNANT WOMEN

COUNTRY	SURVEY	PREGNANT WOMEN ITN USE (%)
ANGOLA	MIS 2006-2007 DHS 2015-2016	22 23
BENIN	DHS 2006 DHS 2017	20 80
BURKINA FASO	DHS 2010 DHS 2021 KIR	45 71
CAMEROON	DHS 2011 DHS 2018	20 61
CÔTE D'IVOIRE	DHS 2011-2012 DHS 2021 KIR	40 64
DRC	MICS 2010 MICS 2018	43 52
ETHIOPIA	MIS 2007 MIS 2015-2016	43 44
GHANA	DHS 2003 MIS 2019	3 49
GUINEA	MICS 2007 MIS 2021	3 39
KENYA	MIS 2007 DHS 2022 KIR	40 45
LIBERIA	MIS 2009 MIS 2022 KIR	33 53
MADAGASCAR	DHS 2008-2009 DHS 2021	46 55

COUNTRY	SURVEY	PREGNANT WOMEN ITN USE (%)
MALAWI	DHS 2004 MICS 2019-2020	15 66
MALI	DHS 2006 MIS 2021	29 76
MOZAMBIQUE	MIS 2007 MIS 2018	7 76
NIGER	DHS 2012 MIS 2021 KIR	20 90
NIGERIA	MIS 2010 MIS 2021	34 50
RWANDA	DHS 2005 DHS 2019-2020	17 56
SENEGAL	MIS 2006 MIS 2020-2021	17 53
SIERRA LEONE	MIS 2016 DHS 2019	44 64
TANZANIA	DHS 2004-2005 MIS 2017	16 51
UGANDA	DHS 2006 MIS 2018	10 65
ZAMBIA	MIS 2006 MIS 2021	24 41
ZIMBABWE	DHS 2010-2011 MICS 2016	9 24

"Use" is defined as the percentage of pregnant women who slept under an ITN the night before the survey.

IPTp COVERAGE IN PMI COUNTRIES—TWO DOSES

COUNTRY	SURVEY	IPTP2 (%)
ANGOLA	MIS 2006-2007	3
	DHS 2015-2016	37
BENIN	DHS 2006	3
	DHS 2017	34
BURKINA FASO	DHS 2010	39
	DHS 2021 KIR	79
CAMEROON	DHS 2011	26
	DHS 2018	54
CÔTE D'IVOIRE	DHS 2011-2012	18
	DHS 2021 KIR	59
DRC	MICS 2010	21
	MICS 2018	31
GHANA	MICS 2006	28
	MIS 2019	80
GUINEA	DHS 2005	4
	MIS 2021	74
KENYA	MIS 2007	14
	DHS 2022 KIR	20
LIBERIA	MIS 2009	45
	MIS 2022 KIR	80
MADAGASCAR	DHS 2008-2009	6
	DHS 2021	41
MALAWI	MICS 2006	47
	MICS 2019-2020	75
MALI	DHS 2006	10
	MIS 2021	57
MOZAMBIQUE	MIS 2007	16
	MIS 2018	61
NIGER	DHS 2012	35
	MIS 2021 KIR	56
NIGERIA	MIS 2010	13
	MIS 2021	46
SENEGAL	MIS 2006	49
	MIS 2020-2021	69
SIERRA LEONE	MIS 2016	71
	DHS 2019	74
TANZANIA	DHS 2004-2005	22
	MIS 2017	56
UGANDA	DHS 2006	16
	MIS 2018	72
ZAMBIA	MIS 2006	57
	MIS 2021	79
ZIMBABWE	DHS 2010-2011	8
	MIS 2016	36

Data come from nationwide household surveys that measured coverage of IPTp2 for pregnant women, defined as the percentage of surveyed women who received at least two doses of sulfadoxine-pyrimethamine during their last pregnancy in the past two years.

IPTp is not part of the national policy in Ethiopia and Rwanda.

Kenya, Madagascar, and Zimbabwe implement IPTp subnationally because of heterogeneous malaria transmission with areas of low risk. Data here are national and likely underestimate coverage in priority areas.

IPTp COVERAGE IN PMI COUNTRIES—THREE DOSES

COUNTRY	SURVEY	IPTP3 (%)
ANGOLA	MIS 2006-2007	1
	DHS 2015-2016	20
BENIN	DHS 2006	0
	DHS 2017	14
BURKINA FASO	DHS 2010	5
	DHS 2021 KIR	57
CAMEROON	DHS 2011	12
	DHS 2018	32
CÔTE D'IVOIRE	DHS 2011-2012	7
	DHS 2021 KIR	35
DRC	DHS 2013	5
	MICS 2018	13
GHANA	DHS 2008	27
	MIS 2019	61
GUINEA	MICS 2016	30
	MIS 2021	50
KENYA	MIS 2007	7
	DHS 2022 KIR	13
LIBERIA	MIS 2009	10
	MIS 2022 KIR	63
MADAGASCAR	DHS 2008-2009	2
	DHS 2021	31
MALAWI	DHS 2004	14
	MICS 2019-2020	48
MALI	MIS 2015	18
	MIS 2021	34
MOZAMBIQUE	DHS 2011	10
	MIS 2018	41
NIGER	DHS 2012	9
	MIS 2021 KIR	25
NIGERIA	MIS 2010	5
	MIS 2021	31
SENEGAL	MIS 2006	7
	MIS 2020-2021	38
SIERRA LEONE	MIS 2016	31
	DHS 2019	36
TANZANIA	DHS 2004-2005	3
	MIS 2017	26
UGANDA	DHS 2006	6
	MIS 2018	41
ZAMBIA	DHS 2007	41
	MIS 2021	68
ZIMBABWE	DHS 2010-2011	5
	MIS 2016	20

Data come from nationwide household surveys that measured coverage of IPTp3 for pregnant women, defined as the percentage of surveyed women who received at least three doses of sulfadoxine-pyrimethamine during their last pregnancy in the past two years.

IPTp is not part of the national policy in Ethiopia and Rwanda.

Kenya, Madagascar, and Zimbabwe implement IPTp subnationally because of heterogeneous malaria transmission with areas of low risk. National coverage estimates included here are national and vtherefore likely underestimate coverage in priority areas.

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COVER PHOTO: *A child in a farming community in Nigeria's north-west state of Zamfara under their insecticide-treated net.*
Photo credit: U.S. President's Malaria Initiative for States (PMI-S) project

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