16TH ANNUAL

REPORT TO CONGRESS

PMI | U.S. PRESIDENT'S MALARIA INITIATIVE

LED BY

USAID FROM THE AMERICAN PEOPLE

CDC

APRIL 2022

A family in Nigeria with their new nets. Photo: USAID Global Health Supply Chain Program—Procurement and Supply Management

Cover Photo: Joel Mulwa/USAID Kenya's Afya Ugavi Project

A MESSAGE

FROM ACTING U.S. GLOBAL MALARIA COORDINATOR JULIE WALLACE

This past year was one of the most challenging in our recent history as the global community continued to respond to the COVID-19 pandemic. COVID-19 greatly impacted malaria control efforts by disrupting supply chains for antimalarial medicines, overburdening and infecting health workers, and making communities unable or fearful of seeking needed testing and treatment.

In 2020, there were an estimated 14 million more malaria cases and 69,000 more deaths than in 2019. Two-thirds of the additional deaths (47,000 people) were due to COVID-19 disruptions.

At the same time, countries with strong malaria programs fared well even under the toughest circumstances of the pandemic and in some cases during conflict, war, and displacement. This past year showed that malaria activities helped strengthen public health capacity, including lab capacity, supply chains, distribution systems, and disease surveillance systems.

We can take two key lessons from these recent experiences. Malaria, one of the world's first pandemics, will resurge—and quickly—if we do not keep up our efforts. Second, and more importantly, our approaches work, even when facing immense challenges, and we can do more and come back even stronger.

Thanks to the generosity of the American people and Congress, the U.S. President's Malaria Initiative (PMI) adapted and persevered through the pandemic to provide 231,420 trainings to healthcare workers and protect more than 700 million people with lifesaving malaria resources.

So we remain hopeful. We also have an updated plan to support this hope. In September 2021, PMI submitted to Congress our new strategy for 2021–2026, titled "End Malaria Faster." We have the bold vision to end malaria within our generation. And the billion-dollar-a-year strategy will accelerate our vision by helping the world save more than four million lives and prevent over one billion cases over the next five years.

Together we can get back on track and end this disease in our lifetime. The fight against one of our oldest pandemics is winnable.

ABOUT PMI

PMI is a multiagency initiative, led by the U.S. Agency for International Development (USAID) and coimplemented with the U.S. Department of Health and Human Services' Centers for Disease Control and Prevention (CDC). PMI has strong support from and collaborates closely with the White House and National Security Council, Department of Defense, National Institutes of Health, Peace Corps, and other U.S. government entities. PMI works hand in hand with national malaria programs and supports partner governments' national malaria strategies. PMI also engages with the Global Fund to Fight AIDS, Tuberculosis, and Malaria (Global Fund); local research institutions and universities; nongovernmental organizations; faith and community groups; and the private sector to strengthen local leadership and wide-ranging investment in fighting malaria.

PMI works to end malaria, one of the world's longest and deadliest pandemics. Malaria causes hundreds of millions of infections and claims hundreds of thousands of lives every year. With 24 partner countries in sub-Saharan Africa and three programs across the Greater Mekong Subregion in Southeast Asia, PMI delivers lifesaving interventions—such as insecticide-treated nets and sprays that kill malaria-carrying mosquitoes, and tests and medicines that help diagnose and treat malaria.

Thanks to the generous support of the American people and Congress, PMI has invested billions of dollars since its creation in 2005. PMI and its partners invest in health workers, laboratories, supply chains, surveillance, behavior change, and other health systems pillars to control and eliminate malaria, save lives, and strengthen global health security. It has helped lead global efforts to collectively save more than 10.6 million lives and prevent more than 1.7 billion malaria infections since 2000.

A midwife and a pregnant patient are happy at the end of the prenatal visit that mom and baby are protected from malaria. Photo: PMI Impact Malaria

CURRENT MALARIA SITUATION

Malaria is one of the world's oldest and deadliest diseases. Eliminated in the United States in the early 1950s, malaria remains a major global health security and economic threat—nearly half of the world's population is still at risk. Malaria parasites are spread by infected female *Anopheles* mosquitoes when they bite. Early symptoms, such as fever, headache, and chills, may be mild and difficult to recognize. If not treated, malaria can rapidly progress to severe illness and death.

The World Health Organization (WHO) estimated **241 million malaria cases** and **627,000 malaria deaths** worldwide in 2020; an estimated 602,000 malaria deaths (96 percent) were in Africa and 80 percent of these deaths in Africa were in children under five.

The WHO estimated that $6.8 billion was needed to fight malaria in 2020[1]; current global funding for malaria is around $3.3 billion annually and despite increases in U.S. funding, the resource gap has widened over recent years, putting progress against malaria at risk.

In 2021, PMI supported the formation of 47 community support groups in Burma to engage communities and strengthen local capacity to defeat malaria. Photo: Zwe Thu Tun/URC

BIPARTISAN SUCCESS STORY THAT SAVES LIVES

PMI is a unique example of the true power of bipartisanship. Thanks to the bipartisan support of Congress and the generosity of the American people, USAID's malaria appropriation, supporting PMI, was $770 million in FY 2021, enabling the protection of more than 700 million people.

Pregnant women and young children are at highest risk for severe malaria and death. PMI interventions in 27 countries lead to healthy mothers who deliver healthy babies, healthy children who can go to school, and healthy communities—which in turn help make the world safer and more prosperous for us all.

Billions of our fellow human beings are at risk of dying from diseases that we know how to prevent. Many children are just one mosquito bite away from death. And that is a moral outrage. It is a profound injustice. It is literally a matter of life and death, and now the world must act. We cannot leave people behind.

— Former President Barack Obama

The goal of defeating malaria is a challenging goal, yet it can be done. It's not going to require a miracle; it just requires a smart, sustained, focused effort.

— Former President George W. Bush

A spray campaign in Rwanda supported by PMI in fiscal year 2021.
Photo credit: PMI VectorLink Rwanda

The U.S. Government, through PMI and the U.S. contribution to the Global Fund, played a leading role in helping partner countries and saving lives.

In FY 2021 PMI benefited **700 million people**

Together with our partners, PMI has helped **save 10.6 million lives and prevent 1.7 billion malaria infections** worldwide since 2000

PMI DELIVERED:

45.7m mosquito nets (ITNs)

TO PROTECT: **91.4m** people

Insecticide to spray **5.8m** homes (IRS)

TO PROTECT: **21.2m** people

34m seasonal preventive treatments (SMC)

TO PROTECT: **8.4m** children

155.3m rapid diagnostic tests (RDTs)

TO PROTECT: **155.3m** people

16.2m preventive treatments in pregnancy (IPTp)

TO PROTECT: **5.4m** women

113.6m malaria medicines (ACTs)

TO PROTECT: **113.6m** people

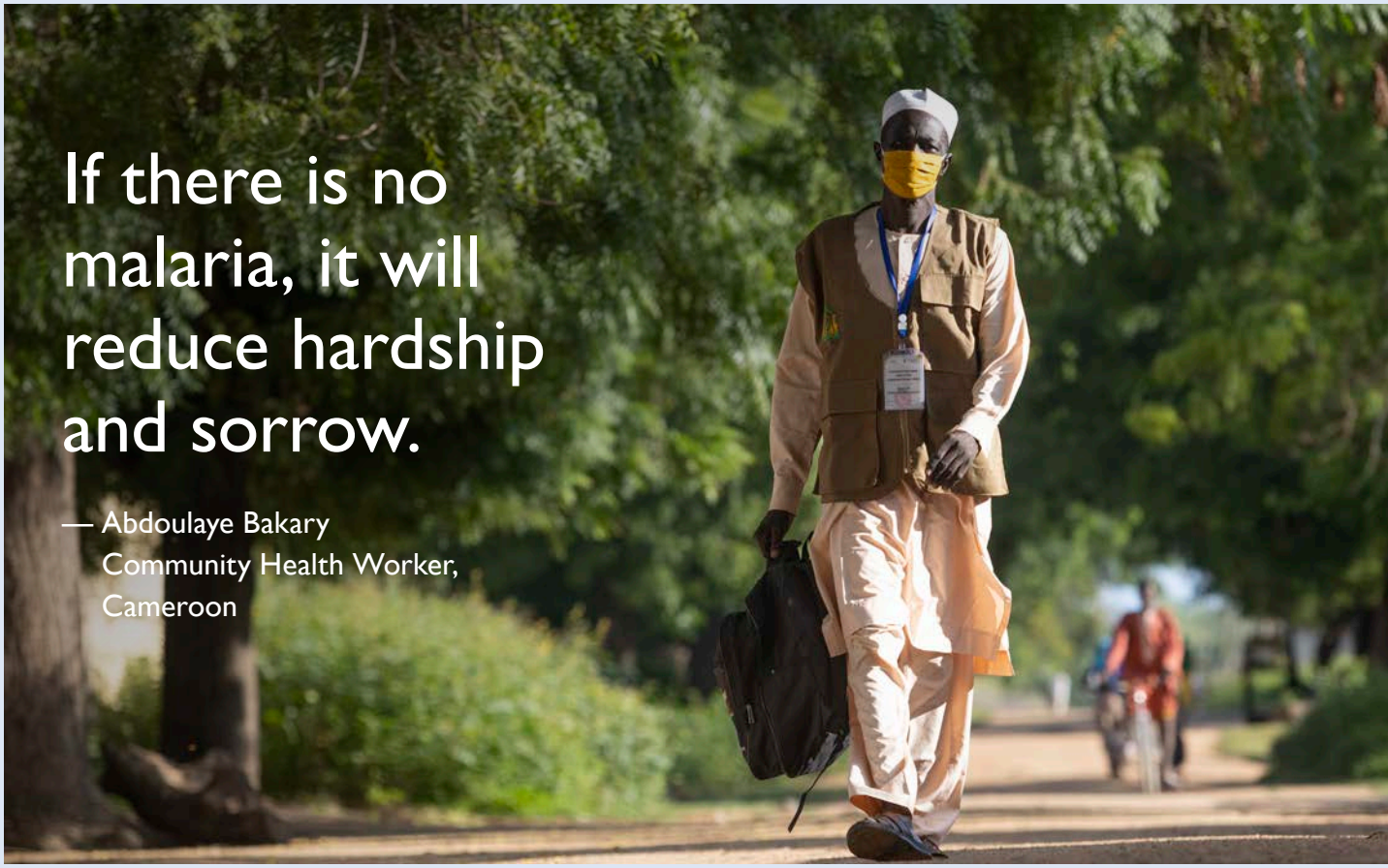
Since 2006, in countries where PMI works, global efforts have supported:

↓ **43%**
AVERAGE DECREASE IN CHILD DEATH RATE FROM ALL CAUSES[I]

↓ **26%**
DECLINE IN MALARIA CASE RATES[II]

↓ **42.7%**
DECLINE IN MALARIA DEATH RATES[II]

[I] Modeled all-cause child mortality data from UNICEF. Estimates generated by the UN Inter-agency Group for Child Mortality Estimation in 2021.
[II] World Malaria Report 2021 data.



If there is no malaria, it will reduce hardship and sorrow.

— Abdoulaye Bakary
Community Health Worker,
Cameroon

Many in Bogo, Cameroon, cannot afford to go to the hospital, but everyone knows community health worker Abdoulaye Bakary. For 15 years, Abdoulaye has visited homes to treat children for fever and provide health education. He used to bicycle 18 kilometers away to see patients, but now that there are more health workers, he only has to go as far as five kilometers. He is one of more than a thousand community health workers in Cameroon who PMI supports with supplies, training, and supervision.

In September 2021, Abdoulaye was called to the home of Fadimatou Ndjidda, a mother of three small children and pregnant with a fourth. Her eldest, four-year-old Aissatou Hamadou, was "burning up." Confirming a fever and a positive rapid malaria test, Abdoulaye gave the little girl a dose of antimalarials and instructions to her mother for finishing the course of medicines. He also told Fadimatou to ensure the whole family slept under a bed net each night. When Abdoulaye returned the next day, the little girl was already up and playing. Someday, her

mother hopes, Aissatou will go to school and become a doctor, soldier, or teacher.

During the rainy season, when malaria cases spike, parents wake Abdoulaye in the night with their sick children. He used to see an average of ten patients every week, but now he sees half that, at most, thanks to an intervention called seasonal malaria chemoprevention. Abdoulaye and other health workers distribute monthly courses of antimalarial medicine to children under five to prevent them from getting sick.

Four-year-old Aissatou Hamadou takes malaria medicine after she tests positive for malaria. Photo credits: PMI Impact Malaria

CONTINUING CARE IN A CRISIS

With adaptations to ensure safety of staff and beneficiaries from the COVID-19 pandemic, 100% of PMI-supported campaigns planned for FY 2021 were completed:

17 indoor residual spray campaigns protected about **21 million people**

9 preventive medicine campaigns during the rainy season protected more than **8 million children**

Mosquito net campaigns in 15 countries delivered **109 million nets** in collaboration with Global Fund and other partners

Due to strong country leadership, PMI-supported lifesaving interventions continued to serve those at greatest risk while adapting to mitigate the risk of COVID-19. Delivery adaptations like distributing bed nets and medicines door-to-door helped people avoid large gatherings, and workers were provided with personal protective equipment and training to protect themselves and others from transmission.

Up to half the population in some parts of sub-Saharan Africa seek care for fever from private healthcare providers. To help ensure these facilities have the resources they need to stay afloat during COVID-19, PMI and USAID's Bureau for Global Health's Center for Innovation and Impact partnered with the U.S. International Development Finance Corporation to establish a loan guarantee facility with the Medical Credit Fund (MCF) called the Open Doors African Private Healthcare Initiative. The $700,000 investment from PMI will catalyze more than $35 million in working capital loans from MCF so that an estimated 1,600 small and medium-size private health facilities in Kenya, Ghana, Nigeria, Tanzania, and Uganda can continue to provide critical malaria prevention and treatment services.

Four-year-old Mariama Djoulde Diallo in Guinea takes a dose of medicine to protect her from malaria during the rainy season. Health workers instructed her aunt Mariama Laoubhe Diallo on how to administer the medicine, in alignment with COVID-19 precautions. Photo: Sadak Souici/RTI International

DELIVERING CRITICAL COMMODITIES

The COVID-19 pandemic's devastating impacts on global supply chains increased the challenge of getting lifesaving malaria tests, drugs, and bed nets to vulnerable communities. Lockdowns and competition to make COVID-19 products led to reduced manufacturing capacity for malaria commodities. Lack of passenger flights led to less air freight capacity, while container shortages and port congestion crippled ocean freight.

Yet, through intensified collaboration with stakeholders around the globe, PMI identified critical supply issues, monitored country inventory levels, and worked across donors to prioritize orders by urgent need. PMI worked with the U.S. Embassy in India to advocate that key manufacturers of bed nets and rapid diagnostic tests be deemed essential so they would be exempt from lockdowns and permitted to work. Then PMI worked with partner governments to ease importation requirements and allow distribution of the supplies to health clinics.

PMI also continued to improve its supplier base and doubled the number of suppliers of six key malaria commodities over the past three years, including expanding out of a sole source market situation for three of those suppliers. Diversification of the supplier base helps mitigate shocks to the supply system, as experienced with COVID-19.

PMI's collaborations led to countries' inventories reaching or exceeding pre-COVID-19 levels. Over the course of FY 2021, there was a 35 percent overall relative reduction of stockouts of malaria rapid diagnostic tests, artemisinin-based combination therapies (ACTs), and preventive treatments for pregnant women (sulfadoxine-pyrimethamine [SP]). In addition, PMI generated cost savings of $46.5 million for malaria commodities through optimizing supply chain processes and achieving economies of scale, including almost $33.4 million on malaria medicines, $6.5 million on rapid tests, and $6.7 million on bed nets.

Community health volunteers preparing to distribute bed nets to community members in Zambia. Photo: PMI VectorLink

MALARIA PLATFORMS FIGHT CURRENT AND FUTURE PANDEMICS

PMI's investments in people and systems—including improving lab capacity, supply chains, distribution systems, data collection, fever surveillance, and quality assurance of health commodities—have done double duty, saving lives from malaria while working to fight the current pandemic and other infectious diseases. In Kenya, Sierra Leone, and the Democratic Republic of the Congo, PMI strengthened the capacity of health professionals to design, implement, and evaluate social and behavior change programs, critical skills that could be leveraged in countries' response to COVID-19. Laboratory scientists in Rwanda, Niger, and Mozambique trained on molecular techniques for malaria surveillance learned skills that they subsequently used to assist with COVID-19 laboratory analysis. Similarly, national, regional, and district health managers in Senegal, whose training in monitoring and evaluation had been funded by PMI, were also able to contribute to the screening and mapping of COVID-19 cases and provide prompt community response.

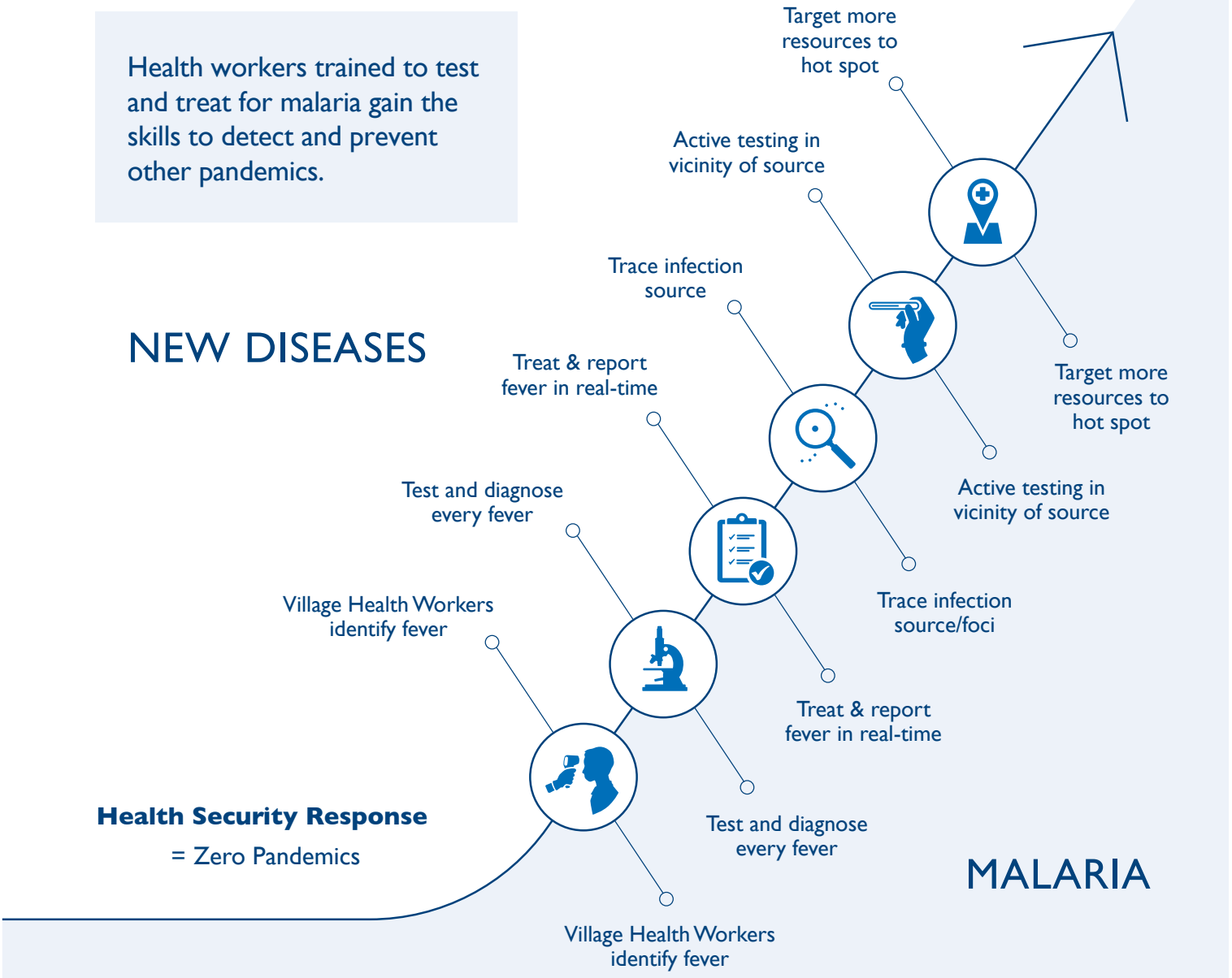
Through funding to CDC's Field Epidemiology Training Program (FETP), PMI partners with 14 countries to ensure global health security while strengthening public health emergency infrastructures as prescribed in the WHO's International Health Regulations.[2] In FY 2021, 415 disease detectives were engaged in FETP intermediate and advanced training across 12 of the reporting PMI partner countries, not only contributing to malaria surveillance and control efforts, but also providing critical assistance to COVID-19 response efforts.

A lab technician in Malawi practices preparing slides at a PMI-supported training on diagnosing malaria with a microscope. Photo: Lawrence Kachule/PMI Impact Malaria

PMI collaborated with the local health district to bring COVID-19 vaccines to the Zambian islands of Kilwa and Chisenga while recruiting residents to work as sprayers for the indoor insecticide campaign against malaria-carrying mosquitoes.

PANDEMICS START AND STOP IN COMMUNITIES

Health workers trained to test and treat for malaria gain the skills to detect and prevent other pandemics.



This graphic was adapted from a figure in the report "Leave No Fever Unresolved: The Malaria Pathway to End This Pandemic and Prevent the Next" by Malaria No More and the UN Foundation.

PMI investments in Madagascar help fight more than malaria

Photo: IMPACT—PSI/Madagascar

- To track malaria, polio, measles, dengue, plague, and influenza-like syndromes, PMI and USAID maternal and child health partners had previously helped **establish 11 monitoring centers** across Madagascar. At the start of the pandemic, these centers were quickly integrated into the country's COVID-19 surveillance system.
- USAID Madagascar **piloted the use of drones** to bring malaria and other health supplies—including COVID-19 vaccines—to three remote districts. This approach may be broadened pending assessments of cost-effectiveness.
- The Ministry of Health's entomology unit, supported by PMI, **led responses to outbreaks of other mosquito-borne diseases,** including Rift Valley fever in April 2021.

A PMI-supported team of epidemiologists and entomologists from the Institut Pasteur de Madagascar and the Ministry of Public Health carried out investigations into other mosquito-borne diseases, including Rift Valley Fever, which is commonly found in domesticated animals.

Photo: IMPACT—PSI/Madagascar

Photo: Institut Pasteur de Madagascar

STRENGTHENING THE HEALTH WORKFORCE AND BRINGING CARE TO PEOPLE

FY 2021 highlighted the importance of a well-supported and adaptable health workforce at all levels of the health system. Even among the most challenging of circumstances, PMI and its partners continued to supply health workers with needed personal protective equipment and training and resources to continue fighting malaria during the pandemic. These same PMI investments have helped countries fight COVID-19 as well. From Liberia to Thailand, community health workers looking for people with fevers have found people with COVID-19, educated and referred them, traced their contacts, promoted mask use, and educated their neighbors about COVID-19 vaccines.

Community health workers equipped with rapid malaria tests and antimalarial drugs can save a neighbor from dying of malaria. Since the beginning of the initiative, PMI has worked closely with country governments and other partners and donors to invest in and scale up community case management of malaria. This is often implemented through an approach called integrated community case management (iCCM) of childhood illness in which the community health worker is also supplied with oral rehydration salts, zinc, and antibiotics to treat children with diarrhea and pneumonia. In FY 2021, PMI supported case management of malaria at the

When a patient's malaria is caused by *P. vivax*, health workers in Cambodia follow up on days 3, 5, and 14 to ensure patients complete the treatments per national guidelines. Photo: Keo Vanney/CMEP

community level in 25 countries, often through the iCCM platform, providing malaria medicines and rapid tests to community health workers, along with an estimated $32.5 million to support training, supervision, and other equipment.

Yet even wide implementation of iCCM ensures essential malaria services only for children under five years of age. When Rwanda noticed an increase in malaria cases between 2012 and 2016, it changed its policy to allow community health workers to test and treat anyone, regardless of age, for malaria. To support this approach of home-based management of malaria for all ages, the country trained 15,000 additional community health workers, and PMI funded 22 out of 30 districts. By 2021, 54 percent of all malaria diagnosis and treatment was performed by health workers in the community and the number of severe malaria cases had decreased. Currently, PMI is conducting research in Madagascar and Malawi to explore the logistical considerations and cost of expanding the ages of those who receive community case management of malaria. The results of this research will provide insights for other countries interested in this approach to reaching the unreached.

In FY 2021, PMI supported more than **100,000 community health workers** to provide malaria testing and treatment services, often through integrated community case management

Photo: Pasin Yuwanakul for USAID Inform Asia

Our partners in Thailand have **cut malaria cases by 90 percent** by leveraging the country's network of a million village health volunteers, bringing malaria in Thailand to the cusp of elimination despite COVID-19.

Health workers trained with PMI funds in FY 2021

33,086
indoor residual spray

25,481
preventive treatment in pregnancy

71,357
seasonal preventive treatment for children

50,406
diagnosis

53,513
clinical care

Photo: PMI

To help families continue to prevent and treat malaria, PMI programs persevered through coups in **Burma**, **Guinea**, and **Mali** and ongoing conflict in **Ethiopia**.

Monitoring sites supported by PMI in FY 2021

100
PARASITE RESISTANCE

262
INSECTICIDE RESISTANCE

252
MOSQUITO BEHAVIOR

Most community health workers are women living in poverty, and are unpaid. Women on the frontlines of healthcare subsidize healthcare globally to the tune of more than $1 trillion with their unpaid labor.[3] To confront these equity issues and support countries in strengthening community health systems, PMI changed an internal policy. Now, PMI funds can be used to pay salaries or stipends to community health workers in settings where payment to them is in line with government policy and resources are needed to implement the policy in the near term. This decision was made to catalyze long-term investment in these workers, who are critical for reaching the hardest-to-reach places with malaria diagnosis and treatment services.

A community health worker uses a rapid diagnostic test on a young boy with a fever in Zambia to see if he has malaria. Photo: Jennifer Somtore, PMI/Zambia

MONITORING AND INNOVATING AGAINST THREATS TO PROGRESS

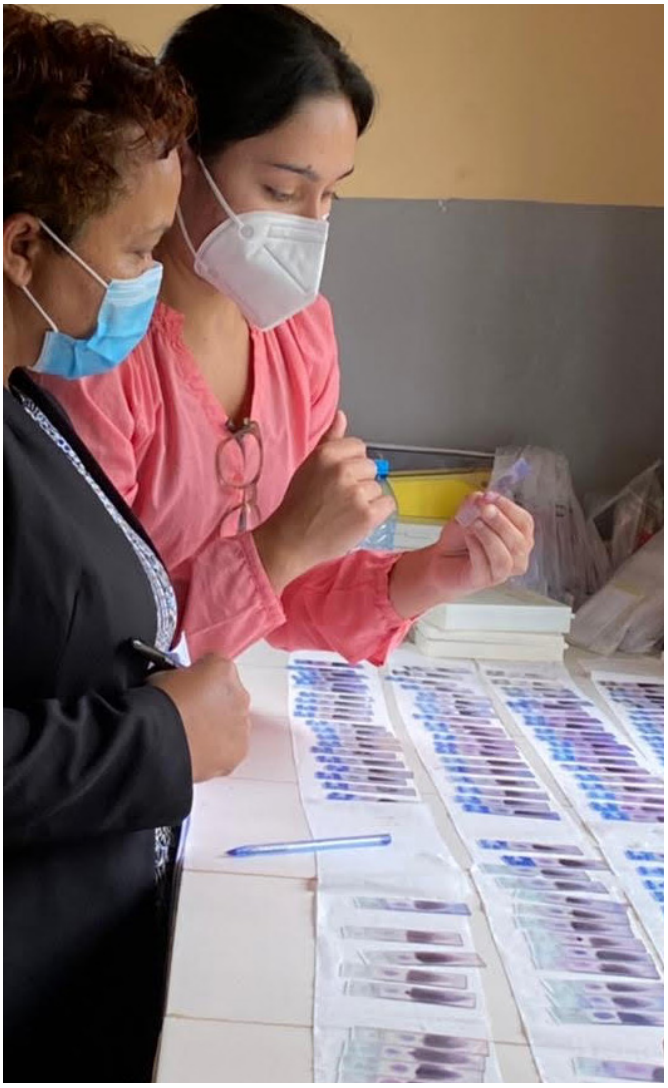
ARTEMISININ RESISTANCE

Without effective malaria treatments, decades of progress could be undone. In FY 2021, PMI supported more than 100 sites in sub-Saharan Africa and across the Greater Mekong Subregion to study and closely monitor antimalarial treatment efficacy, identify genetic markers associated with antimalarial drug resistance, and support training and capacity strengthening of country collaborators. Thankfully, these and other studies show that there are still efficacious ACTs in Africa and even in Asia, where artemisinin resistance is high.

Because artemisinin resistance is prevalent in many countries in the Greater Mekong Subregion, and was recently identified in Rwanda and Uganda, monitoring and selecting efficacious ACTs is a higher priority now than ever, as are good stewardship of current treatments and development of the next generation of antimalarials. PMI published a paper[4] detailing the progress and challenges of implementation of drug efficacy monitoring in Thailand using routine surveillance systems. Supported by the WHO through PMI, this approach has now been scaled up throughout Thailand and is being piloted in Cambodia, Lao PDR, and Vietnam.

Drug and insecticide resistance threaten to set back hard-won gains against malaria.

Finally, the PMI work across many sites in Africa has informed the recently updated WHO recommendations on methodologies for evaluating antimalarial drug efficacy.[5]



PMI supports therapeutic efficacy studies, like this one in Kenya, to monitor whether drugs remain effective in treating malaria parasites.
Photo: Maureen Mabiria/PMI Impact Malaria

INVASIVE MOSQUITOES

Globalization through trade or human movement can threaten global health security by introducing diseases or vector species responsible for spreading diseases into new locations. *Anopheles stephensi* is an invasive malaria mosquito recently introduced into the Horn of Africa that thrives in urban environments and could put an additional 126 million people at risk of malaria if it continues to spread across the continent. PMI established an *Anopheles stephensi* task force in 2021 to develop an action plan for a coordinated and collaborative response in Africa to rapidly detect and respond to the species and ensure that progress made towards malaria control and elimination does not slow down or reverse in the face of this emerging threat.

INSECTICIDE RESISTANCE

One of the greatest threats to malaria control efforts is the emergence of insecticide resistance in mosquitoes, which has been detected in all 27 PMI partner countries. PMI funding supports mosquito surveillance in 252 sites and insecticide resistance monitoring in 262 sites as part of our collaborations with scientists and research institutions in the countries where we work. Through these collaborations, PMI supports quality entomological monitoring, including tracking insecticide resistance, to ensure the optimal vector control interventions are deployed and remain effective at preventing malaria. PMI also provides funding to a product development partnership, the Innovative Vector Control Consortium (IVCC), and strategically engages with insecticide manufacturers to ensure effective insecticide-based tools are developed and used to stay one step ahead of resistance.

PMI partners with the Entomological Research Center of Cotonou to provide Benin's malaria program with key data such as resistance to certain insecticides. This allows Benin to choose the best mosquito-fighting tools for its context. Photo: USAID/Benin

NEW TECHNOLOGY TO HELP FAMILIES SLEEP SAFER

Insecticide-treated bed nets remain a vital shield from malaria-carrying mosquitoes. If local mosquitoes are no longer susceptible to pyrethroid insecticides, then the community needs bed nets made with new types of insecticides. PMI supports national malaria programs' transition to optimal vector control tools by deploying these nets, which are up to $1 more expensive, when warranted by entomological resistance data. In FY 2021, PMI delivered more than 44 million of these new types of nets to 15 partner countries, accounting for approximately 94 percent of total PMI- delivered bed nets. Two additional countries procured new types of nets during FY 2021 for delivery the following year.

A woman in Nigeria with her new net, donated by PMI. Photo: Breakthrough ACTION

NEW TOOLS AND APPROACHES TO GET TO ZERO EMERGING THREATS

In FY 2021, USAID continued to invest in new tool development for malaria drugs through the Medicines for Malaria Venture.[6] This work has supported the development of critical new malaria drugs to treat relapsing malaria and combat drug-resistant infections.

In FY 2021, PMI continued to roll out new and evolving methods of vector control, including new kinds of bed nets and insecticides, funding operational research to improve delivery of its programs, strengthening environmental protections, and deploying digital and data-driven solutions. In Ghana, PMI-supported research[7] estimated that spraying insecticide on the upper half of walls and the ceiling was broadly as effective at reducing malaria as the standard method of spraying insecticide on all surfaces in a room. For example, the research indicated that using this approach across northern Ghana would result in a 33 percent cost saving that would enable spraying of 36,000 additional rooms. PMI continues to conduct operational research to assess the efficacy and scalability of this potentially cost-saving approach across PMI-supported spray programs.

This past year, PMI supported studies on how to help more women have a malaria-free pregnancy. In Malawi, preliminary findings indicate that engaging community health workers as part of teams with midwives and nurses led to a 20 percent increase in the proportion of women attending at least four prenatal visits, which would enable them to receive the needed preventive medicine. In addition, in areas where community health workers delivered intermittent preventive treatment in pregnancy (IPTp), more women living at least five kilometers from a health facility received at least three doses of preventive treatment.

PMI also helped six countries conduct the Malaria Behavior Survey, which asks questions about the factors that—according to behavior change theories—influence the adoption and maintenance of malaria-related behaviors, such as seeking care for children with fever, sleeping under a mosquito net, and taking malaria-prevention medication during pregnancy. By exploring barriers to preventing or treating malaria, countries can adjust their intervention approaches.

In addition, PMI has continued efforts to support expansion of and improvements to country data systems as well as support for data use at all levels of the health system. Examples of investments include training community health workers in data entry and reporting; holding district-level data review meetings and audits to improve data quality; and supporting countries' malaria programs to produce malaria bulletins that facilitate visualization and interpretation of data for better decision making.

Data collectors go door-to-door in the Democratic Republic of Congo to conduct the Malaria Behavior Survey. Photo: Breakthrough ACTION

A NEW MALARIA VACCINE

PMI welcomed the WHO's October 2021 recommendation for widespread use of the historic malaria vaccine RTS,S/AS01 for the prevention of *P. falciparum* malaria in children living in regions with moderate to high malaria transmission. Not only is RTS,S the first malaria vaccine, it is the first antiparasite vaccine for humans, and it is a welcome complement to existing interventions to save vulnerable children from malaria. The lead-up to the WHO's announcement included extensive involvement from the USAID Malaria Vaccine Development Program and critical input from PMI staff in the information and analysis review. USAID has invested $100 million in malaria vaccine research over the past 50 years, including funding the research that identified the critical protein comprising the RTS,S vaccine. CDC's Malaria Branch helped generate critical evidence on the protective efficacy of RTS,S as well as on real-world safety and feasibility of vaccine delivery. Building upon these investments, PMI has established a vaccine development portfolio that includes both public and private partnerships with a goal of accelerating access to efficacious, durable, and affordable vaccines. In December 2021, the board of Gavi, the Vaccine Alliance, approved funding to support the rollout of the malaria vaccine.[8] PMI looks forward to working with global partners to integrate this valuable new tool into comprehensive malaria programs across sub-Saharan Africa.

The new malaria vaccine, which complements existing malaria-prevention tools such as bed nets, has the potential to save tens of thousands of children's lives each year. Photo: Samy Rakotoniaina/MSH

PARTNERSHIPS AT HOME AND ABROAD

PMI complements the malaria work led by other U.S. agency programs—the National Institutes of Health, Department of Defense, and Centers for Disease Control and Prevention—and global partners in research and development to develop new tools for prevention, detection, and treatment. PMI's strength in the innovation space is in scaling up and operationalizing new proven tools.

In addition, PMI leverages investments by the Global Fund, to which the United States is the largest financial contributor and was a founding donor. PMI and the Global Fund's malaria programs have a symbiotic relationship, and their success is mutually dependent in many countries. The Global Fund's malaria investments in sub-Saharan Africa are heavily commoditized—focused on the purchase and delivery of drugs and bed nets—and PMI complements these grants through the planning and execution of country programs, bringing on-the-ground technical assistance. PMI and the Global Fund, including the inspectors general of both institutions, also cooperate closely to combat counterfeiting and the theft and diversion of antimalarial medications. In another key partnership in FY 2021, PMI, the Global Fund, Unitaid, and the IVCC joined together to increase access to, and lower the cost of, dual active ingredient bed nets, including supporting a volume guarantee through MedAccess and the Bill & Melinda Gates Foundation. Over a two-year period, the volume guarantee delivered a $2 per net reduction from the original price for this critical new tool used to combat insecticide-resistant mosquitoes.

Local partnerships are invaluable to PMI's work, and more than 40 local research institutions implement the critical entomological monitoring activities that form the backbone of our vector control programs. Since 2018, PMI has supported the development and operation of the insectary and molecular laboratory at Africa University, a pan-African private university located in the highest-burden malarious province in Zimbabwe. While the funds previously flowed through an international partner, PMI awarded the university direct funding in FY 2021. By transitioning to working directly with a local research partner, PMI further strengthens local leadership and ownership, positioning Zimbabwe to sustain its entomological monitoring long after U.S. development assistance ends.

Photo: Zwe Thu Tun/URC

To reach high-risk populations in Burma with more than **5,500 bed nets** and **11,400 rapid tests**, PMI worked closely with 45 private companies operating in rubber and palm oil production, mining, fishery, hydroelectric power, and construction.

By collaborating with the U.K. government to spray insecticide inside **1.4 million structures** in 14 districts in Uganda, PMI protected roughly **4.5 million people**, more than 93 percent of the targeted population. Of those protected through indoor residual spraying, more than 830,000 were children below five years of age.

Photo: Daniel Eninu/VectorLink

Photo: PMI Impact Malaria

WORKING TO END MALARIA FASTER

We cannot afford to lose the hard-won gains against malaria. PMI's new 2021–2026 strategy, *End Malaria Faster*, aims to address these threats and take advantage of opportunities to end malaria within our lifetime. The U.S. government's goal is to prevent malaria cases, reduce malaria deaths and illness, and accelerate toward elimination in PMI partner countries. Building on the progress to date, PMI will work with national malaria programs in countries that account for 80 percent of the global malaria burden to drive toward the global goals of saving more than four million lives and averting over one billion cases by 2025.

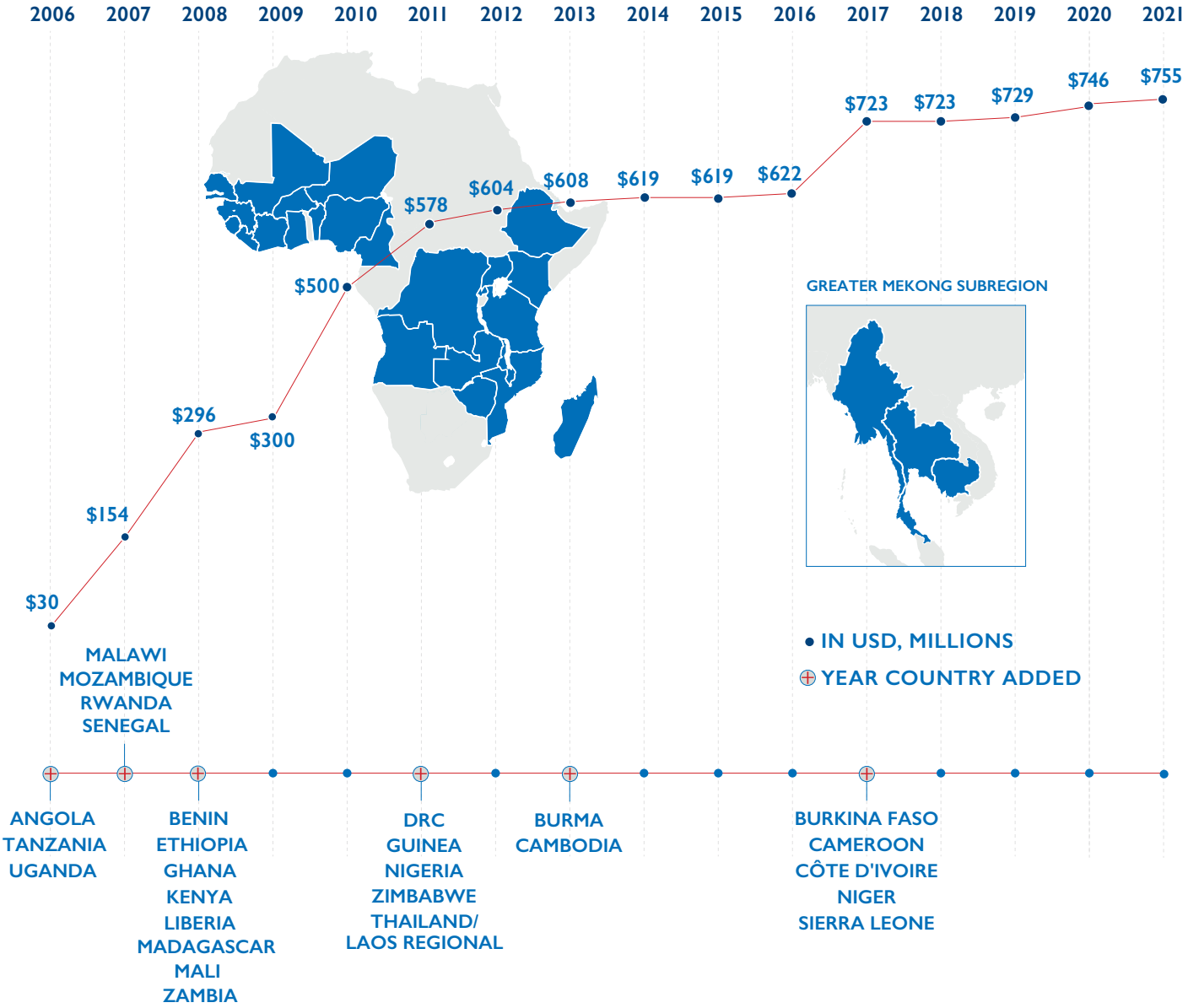
Malaria eradication is an achievable goal, and a goal that promises an almost 20-fold return on investment, could save 11 million lives, and could unlock $2 trillion in economic benefits by 2040.[9] Malaria eradication will lead to a healthier, more productive workforce and health systems that are less burdened by the disease and better prepared for the next pandemic. PMI looks forward to working with Congress and our partners to end this treatable and preventable disease within a generation.

PMI's work ensures a bright future for families like Mariam Kamara's in Sierra Leone. Photo: PMI Impact Malaria

ANNEX I

FUNDING FOR 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 $755 million across its portfolio in FY 2021.



(1) This graphic does not include funding programmed for malaria beyond PMI's focus 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 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. 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 for activities in the region outside of 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 the Latin America and the Caribbean Region ($5 million). (17) FY 2020, USAID also provided funding for malaria activities in Burundi ($8 million), the Latin America and the Caribbean Region ($5 million), and multilateral malaria efforts ($11 million). Please refer to the funding table for more information.

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

	PMI FUNDING START	FY 2021 ($ MILLION)	ALL YEARS ($ MILLION)
ANGOLA	2006	19	377
BENIN	2008	16.5	234
BURKINA FASO	2017	27.5	129
BURMA	2013	10	84
CAMBODIA	2013	10	69
CAMEROON	2017	22.5	111
CÔTE D'IVOIRE	2017	25	125
DRC	2011	54.5	524
ETHIOPIA	2008	36	508
GHANA	2008	28	383
GUINEA	2011	15	148
KENYA	2008	33.5	464
LIBERIA	2008	14	188
MADAGASCAR	2008	26	357
MALAWI	2007	24	340
MALI	2008	26.5	339
MOZAMBIQUE	2007	29	416
NIGER	2017	19	91
NIGERIA	2011	74	768
RWANDA	2007	19.5	273
SENEGAL	2007	25.5	341
SIERRA LEONE	2017	16	76
TANZANIA	2006	42	659
THAILAND/LAOS	2011	3	53
UGANDA	2006	34	481
ZAMBIA	2008	30	352
ZIMBABWE	2011	15	161
HEADQUARTERS	2006	60	553
TOTAL	**—**	**755**	**8,604**

All years funding numbers have been rounded to the nearest million. In FY 2021, USAID also provided funding for malaria activities in Burundi ($7.5 million), the Latin America and the Caribbean Region ($5 million), and Africa Region ($2.5 million). In addition, the U.S. government is the largest donor to the Global Fund to Fight AIDS, Tuberculosis, and Malaria. The Global Fund was the other leading source of donor funding for country malaria programs over the same period.

In Sierra Leone, Petifu Junction Health Centre staff member Hawa Sesay greets Mayillah Kamara and her son, Hassan.

Photo: PMI Impact Malaria

ANNEX 2

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

- The reporting timeframe is the 2021 Federal fiscal year (FY), which runs from October 1, 2020 to September 30, 2021.
- 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 beneficiary 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 control programs and other donors to optimize coordination and avoid duplications or gaps.
- Procurements and deliveries may appear 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.

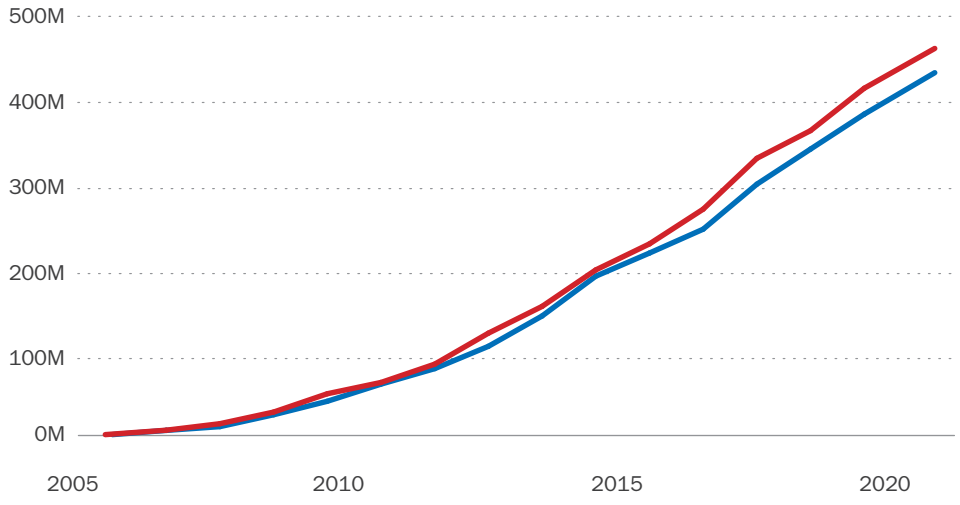
FY 2021 HIGHLIGHTS:

43,755,604
ITNs Procured

45,709,022
ITNs Delivered

Notes: 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.

	ITNs PROCURED	ITNs DELIVERED
ANGOLA	4,053,800	600,000
BENIN	550,000	-
BURKINA FASO	1,243,977	551,300
BURMA	150,000	350,000
CAMBODIA	336,000	336,000
CAMEROON	609,999	642,957
CÔTE D'IVOIRE	1,144,559	3,613,720
DRC	1,169,683	28,000
ETHIOPIA	2,810,219	3,348,538
GHANA	1,048,825	4,531,839
GUINEA	234,900	-
KENYA	1,663,576	4,742,348
LIBERIA	479,000	200,000
MADAGASCAR	-	3,677,000
MALAWI	1,200,000	1,900,000
MALI	1,846,000	1,846,000
NIGER	100,000	-
NIGERIA	13,153,400	7,301,917
RWANDA	1,142,263	-
SENEGAL	2,556,477	723,632
SIERRA LEONE	327,631	627,631
TANZANIA	3,634,695	4,716,854
THAILAND/LAOS	471,187	200,873
UGANDA	1,304,413	1,942,413
ZAMBIA	600,000	2,498,000
ZIMBABWE	1,925,000	1,330,000



ALL YEARS CUMULATIVE

450,219,829
ITNs Procured

421,843,333
ITNs Delivered

In FY 2021 PMI supported a mass distribution of insecticide-treated nets in Bungoma County, Kenya. Workers navigated the terrain on donkeys, motorcycles, and tractors to get nets to 145,786 residents, including Peter Kimtai and his family, in the hard-to-reach parts of Cheptais subcounty.

Photo credit for all photos: Joel Mulwa, USAID Kenya's Afya Ugavi Project

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 2021 HIGHLIGHTS:

5,750,411
Houses Sprayed

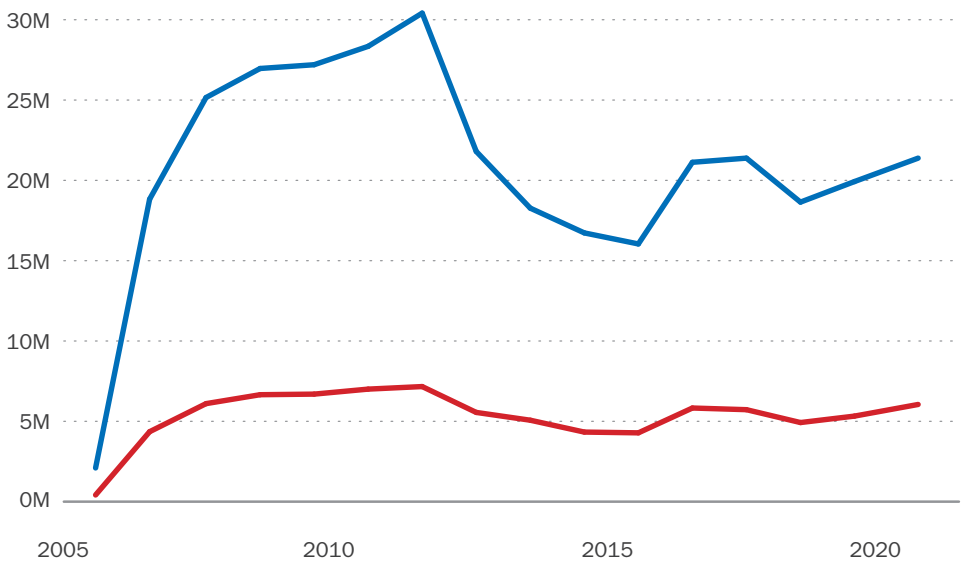
21,235,024
Residents Protected

33,086
IRS Spray Personnel Trained

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
BENIN	280,237	927,007
BURKINA FASO	175,523	586,249
CÔTE D'IVOIRE	60,496	201,178
ETHIOPIA	604,921	1,618,765
GHANA	329,838	928,692
KENYA	497,564	2,083,177
MADAGASCAR	197,787	833,483
MALAWI	114,196	453,383
MALI	61,791	233,663
MOZAMBIQUE	361,820	1,619,088
RWANDA	346,277	1,340,280
SENEGAL	141,717	556,620
SIERRA LEONE	150,895	672,696
TANZANIA	598,973	2,285,089
UGANDA	1,046,384	3,803,915
ZAMBIA	648,914	2,776,336
ZIMBABWE	133,078	315,403



ALL YEARS
ANNUAL

Residents Protected

Houses Sprayed

Applying insecticide inside a home in Mozambique.

Photo: Ernest Fletcher/PMI VectorLink

INTERMITTENT PREVENTIVE TREATMENT IN PREGNANCY (IPTp)

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

FY 2021 HIGHLIGHTS:

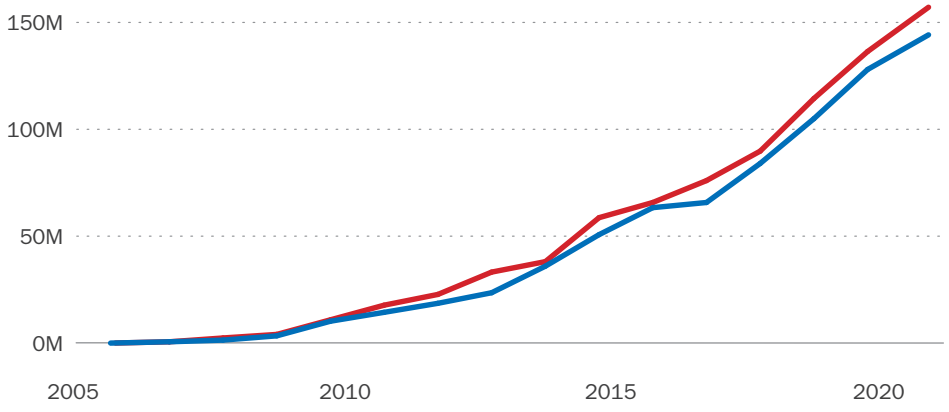
20,710,867
IPTp Doses Procured

16,203,867
IPTp Doses Delivered

25,481
Health Workers Trained in IPTp Use

Notes: Table reports the number of IPTp doses purchased and delivered with PMI funding. In some cases (due to lead time, etc.), SP 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 multi-pronged approach to preventing malaria in pregnancy.

	IPTp DOSES PROCURED	IPTp DOSES DELIVERED
ANGOLA	2,500,000	2,500,000
BENIN	1,300,000	650,000
CAMEROON	747,050	105,000
DRC	5,827,150	2,000,000
GHANA	1,940,000	970,000
LIBERIA	253,333	337,500
MADAGASCAR	1,150,000	500,000
MALAWI	1,733,333	1,633,333
MALI	2,126,667	2,000,000
NIGER	1,000,000	1,424,700
TANZANIA	-	2,250,000
ZAMBIA	1,833,333	1,833,333
ZIMBABWE	300,000	-



ALL YEARS CUMULATIVE

157,110,093
IPTp Doses Procured

144,190,893
IPTp Doses Delivered

Mamsu Kanu, in Sierra Leone, is one of 5.4 million women whose pregnancy PMI helped protect from malaria in FY 2021.

Photo credit for all photos: PMI Impact Malaria

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.

FY 2021 HIGHLIGHTS:

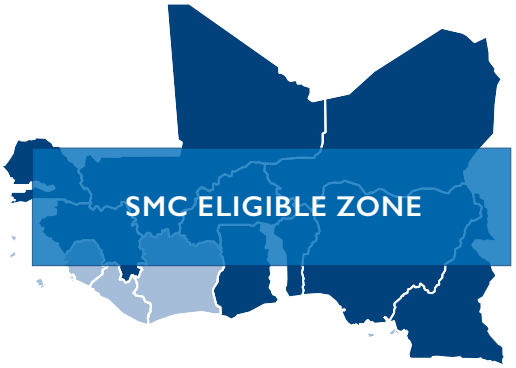
66,586,000
SMC Doses Procured

34,009,900
SMC Doses Delivered

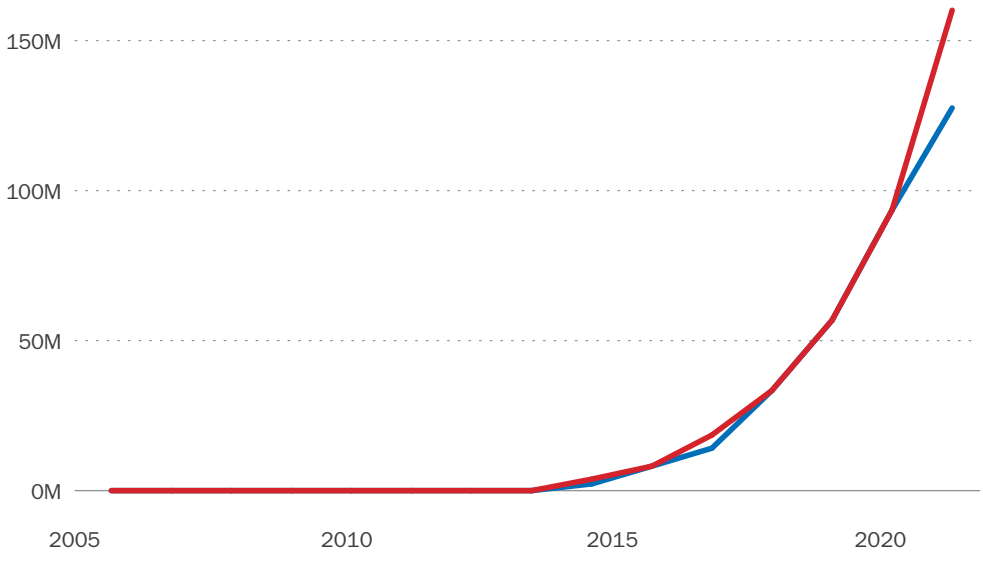
71,357
Health Workers Trained in SMC

Notes: SMC is only recommended in certain geographic regions. PMI funds SMC in all eligible countries it supports. On average, four rounds of treatment are recommended per child (one round per month 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.

	SMC DOSES PROCURED	SMC DOSES DELIVERED
BENIN	1,160,000	580,000
BURKINA FASO	8,380,400	4,126,250
CAMEROON	15,485,550	7,844,600
GHANA	4,673,800	1,878,500
MALI	13,556,000	6,780,000
NIGER	9,263,900	3,249,650
NIGERIA	5,614,400	5,614,400
SENEGAL	8,451,950	3,936,500



Based on WHO criteria,[10] SMC is only implemented in areas of highly seasonal transmission in West Africa.



ALL YEARS CUMULATIVE

160,123,621
SMC Doses Procured

127,547,521
SMC Doses Delivered

In Guinea, Djenabou Diallo is happy her five-month-old son has received a dose of SP-AQ for protection against malaria.

Photo: Sadak Souici/RTI International

RAPID DIAGNOSTIC TESTS (RDTs)

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

FY 2021 HIGHLIGHTS:

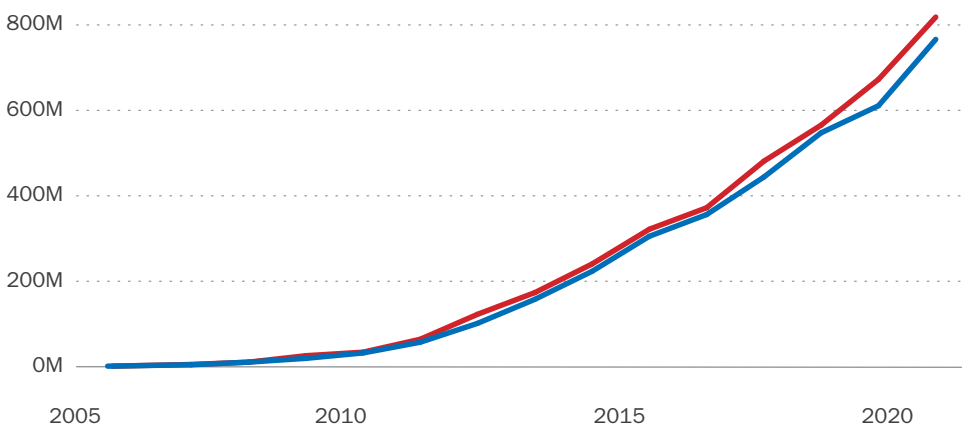
145,810,450
RDTs Procured

155,316,025
RDTs Delivered

50,406
Health workers trained in malaria diagnosis
(RDTs and/or microscopy)

Notes: In some cases (due to lead time, etc.), RDTs procured in a given fiscal year are not delivered until the subsequent one.

	RDTs PROCURED	RDTs DELIVERED
ANGOLA	1,317,600	6,592,150
BENIN	4,000,000	2,000,000
BURKINA FASO	7,000,000	11,250,000
BURMA	400,000	400,000
CAMBODIA	183,200	-
CAMEROON	1,719,700	1,064,250
COTE D'IVOIRE	3,189,275	2,920,750
DRC	20,506,075	12,601,625
GHANA	2,500,000	2,000,000
GUINEA	-	1,759,725
KENYA	1,000,000	5,990,800
LIBERIA	3,200,000	4,420,275
MADAGASCAR	7,876,125	2,000,000
MALAWI	4,575,000	6,250,000
MALI	3,784,575	6,125,000
MOZAMBIQUE	24,450,425	31,026,700
NIGER	4,260,625	2,800,000
NIGERIA	31,215,675	28,579,000
SENEGAL	6,763,125	3,813,125
SIERRA LEONE	1,715,000	1,715,000
TANZANIA	4,700	4,700
THAILAND/LAOS	12,500	450,000
UGANDA	1,250,000	-
ZAMBIA	13,478,850	20,144,925
ZIMBABWE	1,408,000	1,408,000



ALL YEARS CUMULATIVE

818,369,155
RDTs Procured

766,181,105
RDTs Delivered

Nurse Marian Kamara performs a malaria test on four-month-old Hassan Kamara at Petifu Junction Health Centre in Sierra Leone. His mother, Mayillah Kamara, brought him to the center because he was showing signs of malaria. After the test was positive, he received malaria medicine.

Photo: PMI Impact Malaria

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 2021 HIGHLIGHTS:

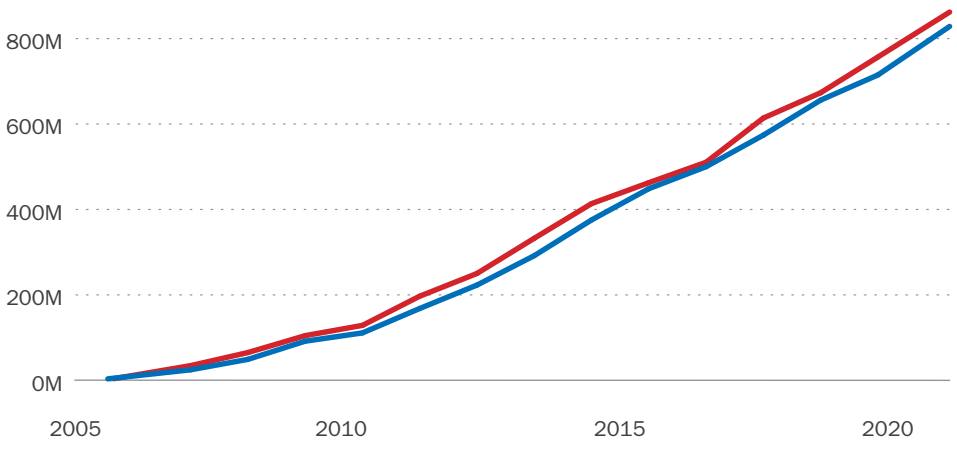
105,138,630
ACTs Procured

113,624,507
ACTs Delivered

53,513
Health workers trained in clinical care

Notes: 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.

	ACTs PROCURED	ACTs DELIVERED
ANGOLA	3,317,700	4,207,450
BENIN	2,367,630	1,999,530
BURKINA FASO	6,000,090	8,501,043
BURMA	10,020	27,000
CAMEROON	1,611,660	1,906,020
CÔTE D'IVOIRE	2,361,660	2,946,600
DRC	18,078,550	12,043,075
ETHIOPIA	537,300	-
GUINEA	-	1,144,110
KENYA	3,090,000	2,670,000
LIBERIA	2,396,700	2,377,080
MADAGASCAR	4,275,600	3,275,600
MALAWI	8,310,000	8,289,990
MALI	3,089,250	1,600,020
MOZAMBIQUE	8,282,880	15,495,150
NIGER	1,859,550	2,300,400
NIGERIA	25,086,240	28,896,408
RWANDA	2,600,610	1,186,590
SENEGAL	1,100,030	839,991
SIERRA LEONE	1,267,070	1,307,370
TANZANIA	3,061,170	2,053,710
THAILAND/LAOS	2,000	16,070
UGANDA	973,530	1,216,770
ZAMBIA	4,831,020	8,804,160
ZIMBABWE	628,370	520,370



ALL YEARS CUMULATIVE

862,061,981
ACTs Procured

828,504,235
ACTs Delivered

A little boy in Zambia takes his prescribed medicines after a community health worker diagnosed him with malaria.

Photo: Jennifer Somtore, PMI/Zambia

ANNEX 3

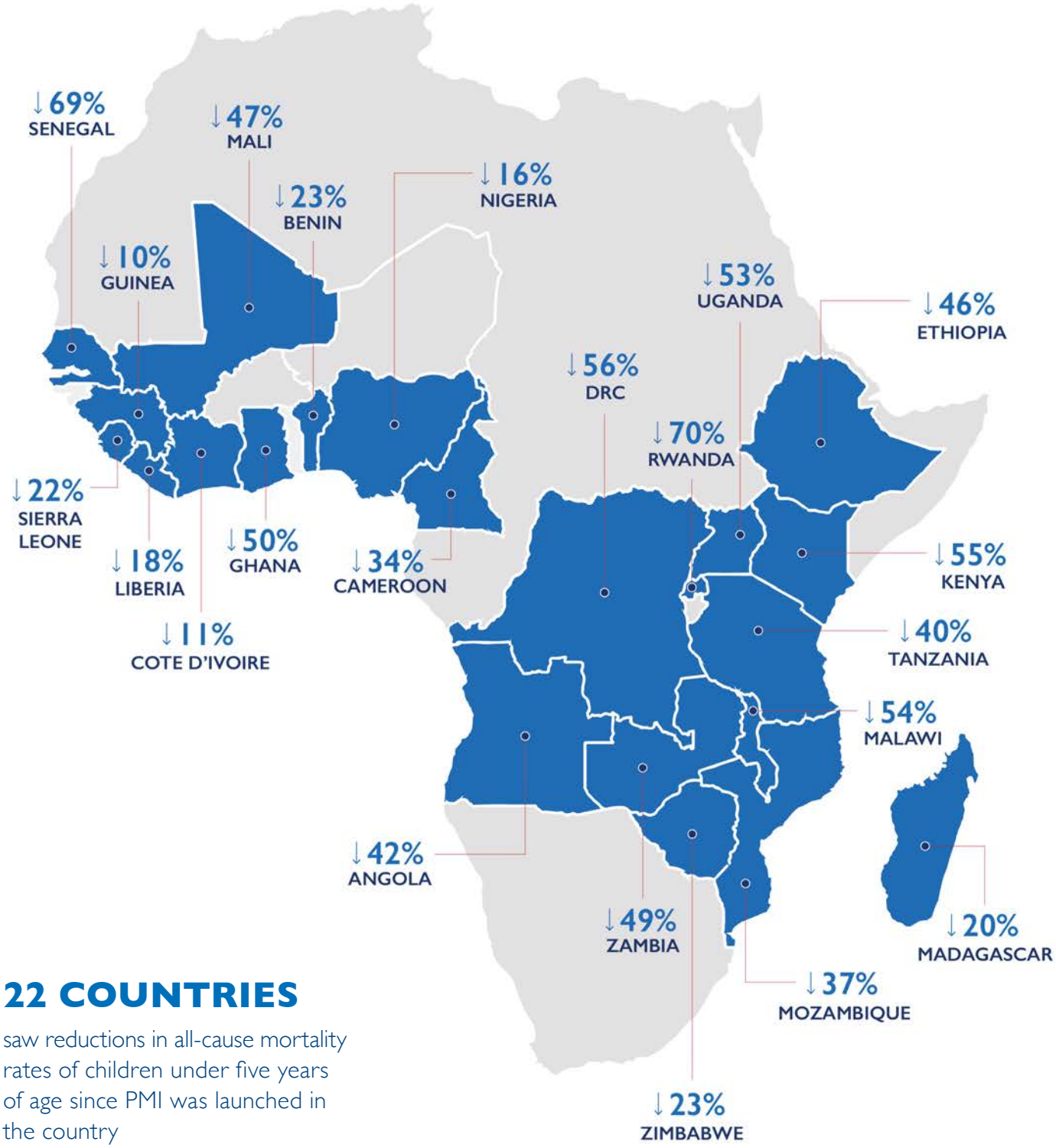
ALL-CAUSE MORTALITY RATES AND INTERVENTION COVERAGE IN U.S. PRESIDENT'S MALARIA INITIATIVE FOCUS COUNTRIES

- 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.

For registered nurse Oretha Sondah, performing a diagnostic test is an essential step in providing quality care for malaria at Gayah Hill Community Clinic in Liberia.

Photo: Karel Prinsloo, Arete, Jhpiego/STAIP project

PERCENT REDUCTIONS IN ALL-CAUSE MORTALITY IN CHILDREN UNDER AGE FIVE IN PMI COUNTRIES IN AFRICA



22 COUNTRIES

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

Note: The 22 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. Burkina Faso and Niger are outlined in white but were not included as data points, as they do not yet have two comparable household surveys available. For more detail on All-Cause Death Rates in Children Under Age 5 in PMI Partner Countries, PMI Baseline and Most Recent Survey, see page 45.

ALL-CAUSE DEATH RATES IN CHILDREN UNDER AGE 5 IN PMI PARTNER COUNTRIES, PMI BASELINE AND MOST RECENT SURVEY

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
CAMEROON	DHS 2011	122
	DHS 2018	80
CÔTE D'IVOIRE	DHS 2011-2012	108
	MICS 2016	96
DRC	MICS 2010	158
	MICS 2017	70
ETHIOPIA	DHS 2005	123
	DHS 2016	67
GHANA	MICS 2006	111
	MICS 2017-2018	56
GUINEA	DHS 2012	123
	DHS 2018	111
KENYA	DHS 2003	115
	DHS 2014	52
LIBERIA	MIS 2009	114
	DHS 2019-2020	93
MADAGASCAR	DHS 2003-2004	94
	DHS 2021 KIR	75
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	11
	DHS 2015-2016	31
BENIN	DHS 2006	25
	DHS 2017	92
BURKINA FASO	MIS 2014	90
	MIS 2017-2018	75
CAMEROON	DHS 2011	36
	DHS 2018	73
CÔTE D'IVOIRE	DHS 2011-2012	68
	MICS 2016	76
DRC	MICS 2010	51
	MICS 2018	63
ETHIOPIA	MIS 2007	65
	MIS 2015-2016	64
GHANA	MICS 2006	19
	MIS 2019	74
GUINEA	MICS 2007	8
	MIS 2021 PR	63
KENYA	MIS 2007	48
	MIS 2020	49
LIBERIA	MIS 2009	47
	DHS 2019-2020	55
MADAGASCAR	DHS 2008-2009	57
	DHS 2021 KIR	69
MALAWI	MICS 2006	38
	MICS 2019-2020	74
MALI	DHS 2006	50
	DHS 2018	90
MOZAMBIQUE	MIS 2007	16
	MIS 2018	82
NIGER	DHS 2012	61
	MIS 2021 KIR	96
NIGERIA	MIS 2010	42
	DHS 2018	61
RWANDA	DHS 2005	15
	DHS 2019-2020	66
SENEGAL	MIS 2006	36
	MIS 2020-2021 KIR	75
SIERRA LEONE	MIS 2016	60
	DHS 2019	68
TANZANIA	DHS 2004-2005	23
	MIS 2017	78
UGANDA	DHS 2006	16
	MIS 2018-2019	83
ZAMBIA	MIS 2006	38
	MIS 2018	80
ZIMBABWE	DHS 2010-2011	25
	MICS 2019	37

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

Expectant mother Emmah Sesay shows the mosquito net she sleeps under at her home in Port Loko, Sierra Leone.

Photo: PMI Impact Malaria

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	MIS 2014 MIS 2017-2018	71 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 PR	2 42
KENYA	DHS 2008 MIS 2020	42 40
LIBERIA	MIS 2009 DHS 2019-2020	25 40
MADAGASCAR	DHS 2008-2009 DHS 2021 KIR	35 48

COUNTRY	SURVEY	ITN ACCESS (%)
MALAWI	DHS 2004 MICS 2019-2020	19 57
MALI	DHS 2006 DHS 2018	30 75
MOZAMBIQUE	DHS 2011 MIS 2018	37 69
NIGER	DHS 2012 MIS 2021 KIR	37 80
NIGERIA	MIS 2010 DHS 2018	29 48
RWANDA	DHS 2005 DHS 2019-2020	9 51
SENEGAL	MIS 2006 MIS 2020-2021 KIR	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 households that could sleep under an ITN if each ITN in the household were used by up to two people.

Children listen to messages about malaria prevention during a social-mobilizer-team visit to a household in Guinea.

Photo: Sadak Souici/RTI International

USE OF ITNs BY CHILDREN UNDER AGE FIVE IN PMI COUNTRIES

COUNTRY	SURVEY	U5 ITN USE (%)
ANGOLA	MIS 2006-2007	18
	DHS 2015-2016	22
BENIN	DHS 2006	20
	DHS 2017	78
BURKINA FASO	MIS 2014	75
	MIS 2017-2018	54
CAMEROON	DHS 2011	21
	DHS 2018	60
CÔTE D'IVOIRE	DHS 2011-2012	37
	MICS 2016	60
DRC	MICS 2010	38
	MICS 2018	51
ETHIOPIA	MIS 2007	41
	MIS 2015-2016	45
GHANA	MICS 2006	22
	MIS 2019	54
GUINEA	MICS 2007	5
	MIS 2021 PR	38
KENYA	MIS 2007	39
	MIS 2020	42
LIBERIA	MIS 2009	26
	DHS 2019-2020	44
MADAGASCAR	DHS 2008-2009	46
	DHS 2021 KIR	56

COUNTRY	SURVEY	U5 ITN USE (%)
MALAWI	MICS 2006	25
	MICS 2019-2020	68
MALI	DHS 2006	27
	DHS 2018	79
MOZAMBIQUE	MIS 2007	7
	MIS 2018	73
NIGER	DHS 2012	20
	MIS 2021 KIR	86
NIGERIA	MIS 2010	29
	DHS 2018	52
RWANDA	DHS 2005	13
	DHS 2019-2020	56
SENEGAL	MIS 2006	16
	MIS 2020-2021 KIR	46
SIERRA LEONE	MIS 2016	44
	DHS 2019	59
TANZANIA	DHS 2004-2005	16
	MIS 2017	55
UGANDA	DHS 2006	10
	MIS 2018	60
ZAMBIA	MIS 2006	24
	MIS 2018	69
ZIMBABWE	DHS 2010-2011	10
	MICS 2019	15

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

Demonstrating how to properly use a bed net in Zamfara, Nigeria.

Photo: Breakthrough ACTION Nigeria

USE OF ITNs BY PREGNANT WOMEN IN PMI COUNTRIES

COUNTRY	SURVEY	ITN USE PREGNANT WOMEN (%)
ANGOLA	MIS 2006-2007	22
	DHS 2015-2016	23
BENIN	DHS 2006	20
	DHS 2017	80
BURKINA FASO	MIS 2014	77
	MIS 2017-2018	58
CAMEROON	DHS 2011	20
	DHS 2018	61
CÔTE D'IVOIRE	DHS 2011-2012	40
	MICS 2016	53
DRC	MICS 2010	43
	MICS 2018	52
ETHIOPIA	MIS 2007	43
	MIS 2015-2016	44
GHANA	DHS 2003	3
	MIS 2019	49
GUINEA	MICS 2007	3
	MIS 2021 PR	39
KENYA	MIS 2007	40
	MIS 2020	40
LIBERIA	MIS 2009	33
	DHS 2019-2020	47
MADAGASCAR	DHS 2008-2009	46
	DHS 2021 KIR	55

COUNTRY	SURVEY	ITN USE PREGNANT WOMEN (%)
MALAWI	DHS 2004	15
	MICS 2019-2020	66
MALI	DHS 2006	29
	DHS 2018	84
MOZAMBIQUE	MIS 2007	7
	MIS 2018	76
NIGER	DHS 2012	20
	MIS 2021 KIR	90
NIGERIA	MIS 2010	34
	DHS 2018	58
RWANDA	DHS 2005	17
	DHS 2019-2020	56
SENEGAL	MIS 2006	17
	MIS 2020-2021 KIR	53
SIERRA LEONE	MIS 2016	44
	DHS 2019	64
TANZANIA	DHS 2004-2005	16
	MIS 2017	51
UGANDA	DHS 2006	10
	MIS 2018	65
ZAMBIA	MIS 2006	25
	MIS 2018	71
ZIMBABWE	DHS 2010-2011	9
	MIS 2016	24

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

Midwife Edith Asare explains to pregnant women in Ghana how to hang a bed net.

Photo: Emmanuel McArthur/VectorLink

COVERAGE OF TWO DOSES OF INTERMITTENT PREVENTIVE TREATMENT OF MALARIA IN PREGNANCY (IPTp) IN PMI COUNTRIES

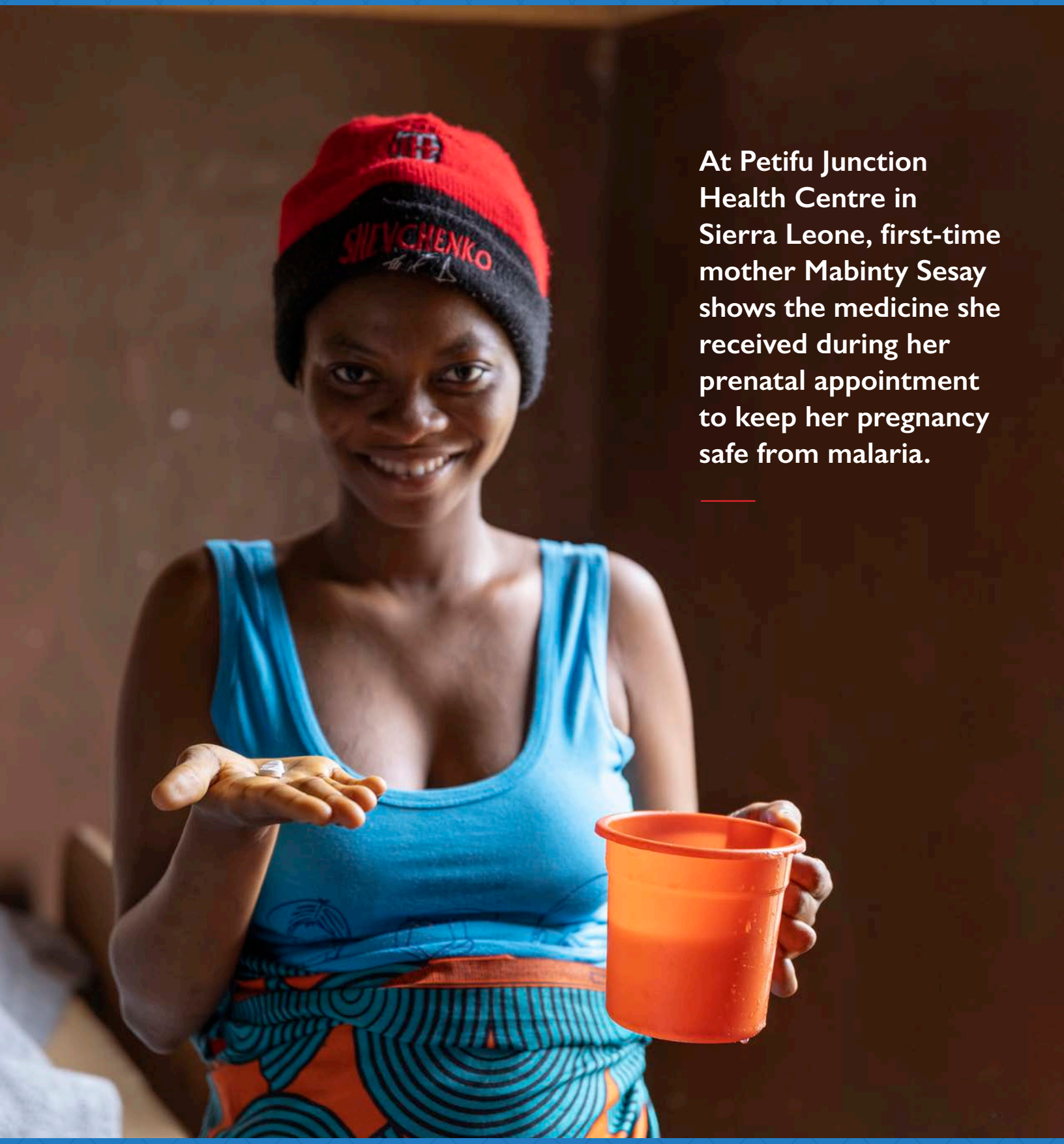
COUNTRY	SURVEY	IPTp2 (%)
ANGOLA	MIS 2006-2007	3
	DHS 2015-2016	37
BENIN	DHS 2006	3
	DHS 2017	34
BURKINA FASO	MIS 2014	48
	MIS 2017-2018	82
CAMEROON	DHS 2011	26
	DHS 2018	54
CÔTE D'IVOIRE	DHS 2011-2012	18
	MICS 2016	47
DRC	MICS 2010	21
	MICS 2018	31
GHANA	MICS 2006	28
	MIS 2019	80
GUINEA	DHS 2005	4
	MIS 2021 PR	74
KENYA	MIS 2007	14
	MIS 2020	30
LIBERIA	MIS 2009	45
	DHS 2019-2020 KIR	70
MADAGASCAR	DHS 2008-2009	6
	DHS 2021 KIR	41

COUNTRY	SURVEY	IPTp2 (%)
MALAWI	MICS 2006	47
	MICS 2019-2020	75
MALI	DHS 2006	10
	DHS 2018	55
MOZAMBIQUE	MIS 2007	16
	MIS 2018	61
NIGER	DHS 2012	35
	MIS 2021 KIR	56
NIGERIA	MIS 2010	13
	DHS 2018	40
SENEGAL	MIS 2006	49
	MIS 2020-2021 KIR	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 2018	81
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.



At Petifu Junction Health Centre in Sierra Leone, first-time mother Mabinty Sesay shows the medicine she received during her prenatal appointment to keep her pregnancy safe from malaria.

Photo: Mwangi Kirubi/PMI Impact Malaria

COVERAGE OF THREE DOSES OF INTERMITTENT PREVENTIVE TREATMENT OF MALARIA IN PREGNANCY (IPTp) IN PMI COUNTRIES

COUNTRY	SURVEY	IPTp3 (%)
ANGOLA	MIS 2006-2007	1
	DHS 2015-2016	19
BENIN	DHS 2006	0
	DHS 2017	14
BURKINA FASO	MIS 2014	22
	MIS 2018	58
CAMEROON	DHS 2011	12
	DHS 2018	32
CÔTE D'IVOIRE	DHS 2011-2012	7
	MICS 2016	23
DRC	DHS 2013	5
	MICS 2018	13
GHANA	DHS 2008	27
	MIS 2019	61
GUINEA	MICS 2016	30
	MIS 2021 PR	50
KENYA	MIS 2007	7
	MIS 2020	22
LIBERIA	MIS 2009	10
	DHS 2019-2020	40
MADAGASCAR	DHS 2008-2009	2
	DHS 2021 KIR	31

COUNTRY	SURVEY	IPTp3 (%)
MALAWI	DHS 2004	14
	MICS 2019-2020	48
MALI	MIS 2015	18
	DHS 2018	28
MOZAMBIQUE	DHS 2011	10
	MIS 2018	41
NIGER	DHS 2012	9
	MIS 2021 KIR	25
NIGERIA	MIS 2010	5
	DHS 2018	17
SENEGAL	MIS 2006	7
	MIS 2020-2021 KIR	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 2018	67
ZIMBABWE	DHS 2010-2011	5
	MICS 2019	13

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 therefore likely underestimate coverage in priority areas.

Fatoumata Binta Bah, in Guinea, receives three tablets of medication every month from her midwife to protect her and her baby against malaria.

Photo: Sadak Souici/RTI International

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Boussoura Marie and her eight-month-old son wait to be served outside a health center in Cameroon.

Photo: PMI Impact Malaria

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