

# How Can We End Malaria?

## Lessons from Around the World

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AGAINST AIDS,  
TUBERCULOSIS  
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# Acknowledgments

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Since 2004, Friends of the Global Fight Against AIDS, Tuberculosis and Malaria has been a leading advocate and source of information on the Global Fund, a public-private partnership that is the largest funder of global health services in the world. Friends also works with partners to advance the Global Fund's mission of ending the three epidemics.

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Malaria No More envisions a world where no one dies from a mosquito bite. More than a decade into our mission, our work has contributed to historic progress toward this goal. Now, we're mobilizing the political commitment, funding, and innovation required to achieve what would be one of the greatest humanitarian accomplishments – ending malaria within our generation.

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**Many children are just one mosquito bite away  
from death. And that is a moral outrage.**

*– President Barack Obama*

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**We know exactly what it takes to prevent and  
treat the disease. The only question is whether  
we have the will to act.**

*– President George W. Bush*

# Introduction

In the last two decades, global efforts against malaria have reached a tipping point, allowing health leaders for the first time to move beyond merely controlling this ancient disease and instead commit to ending it.

Since 2000, we have averted more than 1.5 billion cases of malaria and saved 7.6 million lives, cutting death rates from malaria by more than half. More countries than ever before are closer to elimination and, largely because of the global fight against malaria, a child today has a greater chance of survival than at any point in history.

While we know that COVID-19 has presented challenges and disruptions to malaria control activities in many countries, the global coalition against malaria has shown impressive resilience in the face of the pandemic and remains committed to the vision of a world where no one dies from a mosquito bite.

This report highlights six locations – El Salvador, Ethiopia, India, Senegal, the Greater Mekong Subregion, and Uganda – that are making impressive progress against this treatable and preventable disease. Each case study includes a timeline highlighting the pivotal policy changes, interventions, and innovations that are driving progress.

## Each location uses a combination of six life-saving innovations to prevent, identify, and treat malaria:

- **Bed nets** treated with insecticides to shorten mosquitoes' lifespan and their ability to transmit malaria. Estimated to have prevented 68 percent of malaria cases since the technology was scaled up in 2000, insecticide-treated bed nets have a lifespan of three years. Scientists have worked to develop longer lasting next generation nets and are continuing to research innovations to address insecticide resistance.
- **Indoor residual spraying (IRS)** to kill mosquitoes when they rest on walls inside houses. Countries rotate through a variety of insecticides to prevent the development of insecticide resistance. In 2019, 97 million people were protected by IRS.
- **Rapid diagnostic tests (RDTs)** that can accurately diagnose malaria with a prick of a finger, in less than 15 minutes, at a cost of less than a dollar per test. More than 300 million RDTs are used every year around the world, enabling cheap, accurate, and rapid diagnosis in communities far from hospitals and health clinics.
- **Artemisinin-based combination therapies (ACT)**, developed after common treatments for malaria developed resistance to the mosquito parasite. Artemisinin won a Nobel Prize for the scientist who discovered the drug and has saved millions of lives since it was approved by the World Health Organization (WHO) in 2004.
- **Intermittent preventive treatment (IPTp)** for pregnant women to prevent a miscarriage, pre-term birth, or a low-birthweight (under 5.5 pounds) baby commonly caused by malaria infection. Today, 36 African countries give expectant mothers this treatment and it averted an estimated 426,000 low birthweight newborns in 2019 alone.
- **Seasonal malaria chemoprevention (SMC)**, a groundbreaking approach to malaria prevention, can prevent approximately 75 percent of malaria episodes among the children who receive it. Currently, more than 21 million children under the age of five in 12 high-risk countries across Africa are given a monthly course of medicine to prevent infection during peak malaria season.

## Since 2000:

**1.5 BILLION**

cases of malaria  
averted

**7.6 MILLION**

lives saved from  
malaria

**50+ PERCENT**

reduction in malaria  
death rates



Analysis of data on malaria and gross domestic product (GDP) from 180 countries between 2000 and 2017 shows that each 10% reduction in malaria incidence was associated with an average rise of 0.3% in GDP per capita and faster GDP growth.

Though these six innovations are powerful, no one approach – be it drugs, bed nets, or spraying – can rid the world of malaria. Each of the case studies demonstrate how these innovations, used strategically, in combination, and made accessible to the most vulnerable communities, can drive extraordinary progress. **Just as crucially, the countries profiled in this report developed strong data and surveillance systems, trained community health workers to diagnose and treat malaria, and, when necessary, forged cross-border partnerships to contain the disease.**

None of this would be possible without global investments, largely through the U.S. President's Malaria Initiative; the Global Fund to Fight AIDS, Tuberculosis, and Malaria; the Centers for Disease Control and Prevention; the National Institutes of Health; research facilities like Walter Reed Army Institute of Research; and the RBM Partnership to End Malaria. Steadily increasing U.S. investments and growing partnerships have not just brought us closer to ending malaria, they have also profoundly strengthened health systems around the world.

A comprehensive response to malaria also strengthens health systems and improves health security. For example, the hundreds of thousands of community health workers, trained to diagnose and treat malaria, are now also providing a range of other critical healthcare services, such as administering oral rehydration solutions to save children who have diarrhea and providing women with antenatal care so that they can safely deliver healthy babies. The same scientists trained to use data to track and monitor malaria cases are now also capable of doing the same for tuberculosis, cholera, COVID-19, and a host of other diseases. These bolstered health systems are keeping children healthy so they can stay in school – changing the trajectory of lives, communities, and countries.

To continue on this path, we must prioritize investments and action in order to end malaria within our lifetimes. In 2019 alone, there were still about 229 million cases of malaria and 409,000 deaths – most of them among children and pregnant women.

We must also push for further public and private sector efforts to spur innovation and the development of new technologies. **Today, scientists around the world are at work on revolutionary innovations such as more effective and longer lasting bed nets, monoclonal antibody treatment, powerful new vector control tools, genetically modified mosquitoes, and the world's first malaria vaccine.**

This report makes clear that it is not easy to make sustained progress against malaria, but it is also not a mystery what we need to do to be successful. We have the tools and technical know-how to save millions of lives. We need to focus on scaling up what works, reach those most at risk, innovate and be ready to scale new interventions, and create the political will to end this epidemic once and for all.

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# COVID-19 and Malaria

COVID-19 has taken millions of lives around the world, compromised health systems and placed life-saving programs at risk – including malaria prevention, detection, and treatment.

Despite this unprecedented global challenge – which prompted lockdowns that stopped factory production of critical tools and malaria medicines, made it harder for people to access healthcare, disrupted supply chains and distribution networks, and impacted innovative research and development – the work to end malaria has continued.

**Malaria programs have demonstrated resilience to pandemic disruptions and have contributed to the COVID-19 response through their broad network of community health workers, data and surveillance systems, supply chains, and program implementation platforms.** A survey conducted early in the pandemic by the Global Fund to Fight AIDS, Tuberculosis and Malaria showed that 73 percent of malaria programs reported disruption to service delivery in June 2020. Now more than a year into the pandemic, the status of malaria interventions is mixed. While 90 percent of life-saving malaria preventive intervention campaigns are back on track across Africa, Asia, and the Americas, malaria diagnosis and treatment have still not returned to pre-pandemic levels.

The successful adaptation of prevention campaigns is a testament to the historic partnership between donor and endemic countries; significant and sustained financial investments; the financial and technical support of the U.S. President's Malaria Initiative (PMI), Global Fund, and World Health Organization (WHO); and strong political commitment by leaders around the world to continue the fight against malaria even in the face of the pandemic.

The Global Fund, PMI, the RBM Partnership to End Malaria, WHO, and UNICEF supported the development and communication of early guidance to endemic countries on how they could safely maintain malaria prevention and control services during the pandemic. These organizations and their partners worked diligently to protect the supply chain – from the factory floor to the end user – of malaria prevention, diagnosis, and treatment tools during lockdowns and border closures. When and where those supply chains and activities were compromised, U.S. funding and support, including from the Bill & Melinda Gates Foundation, contributed to modelling analysis to quantify the potential impact of COVID-19-related service disruptions.

As we've seen in the case studies in this report, global efforts to end malaria have had a broad impact beyond this disease and have strengthened health systems around the world. Today, countries have more and better-trained health workers, increased lab capacity and capability, and improved disease surveillance. All of these position countries to better target, monitor, and manage new health threats starting from the community level. These strengthened health systems are more resilient and capable of functioning even during a pandemic as demonstrated across many malaria-endemic countries.

For example, the same community health workers who travel around Ethiopia distributing insecticide-treated bed nets to prevent malaria have gone the extra mile to stop the spread of COVID-19 by safely delivering nets door-to-door and avoiding large gatherings at distribution points during the pandemic. In Uganda, workers with the National Malaria Control Division have gone a step further, delivering not only bed nets to rural areas, but face masks, too. In Cambodia – part of the Greater Mekong Subregion featured in this report – village community health workers do weekly fever screenings that can help sound the alarm on both malaria and COVID-19.

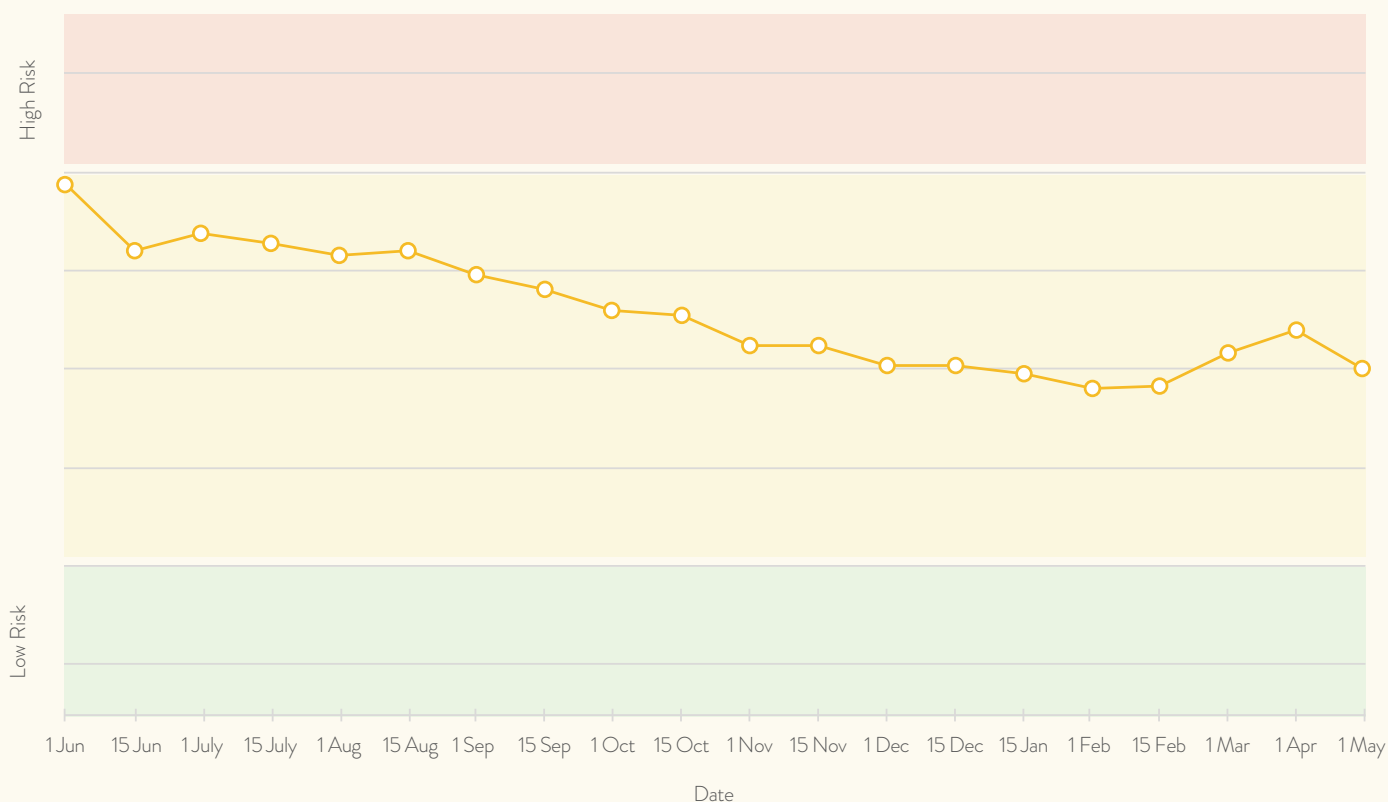
Efforts like these show why so many health leaders around the world have prioritized holding the line against malaria during the pandemic. By continuing life-saving and preventive anti-malaria activities and adapting the way they deliver nets, diagnostics, and medicines to ensure the safety of frontline health workers and communities, countries have shown their resilience and leadership, saving hundreds of thousands of lives from a dual crisis.

The COVID-19 crisis demonstrates the potential impact of epidemics and pandemics on the fight against malaria. It is just one in a series of health emergencies that have challenged malaria efforts over the past two decades, including the West Africa Ebola outbreak and H5N1 influenza. Supply chain and program delays and disruptions caused by such emergencies threaten our goal of reaching a malaria-free world within a generation. But as we've also seen during this pandemic, the malaria infrastructure that has been built over decades is critical. It can be leveraged in times of crisis to secure health systems, continue essential services, and contribute to the detection of pandemic threats through its vast diagnostic network in remote locations.

## Service Delivery Disruption

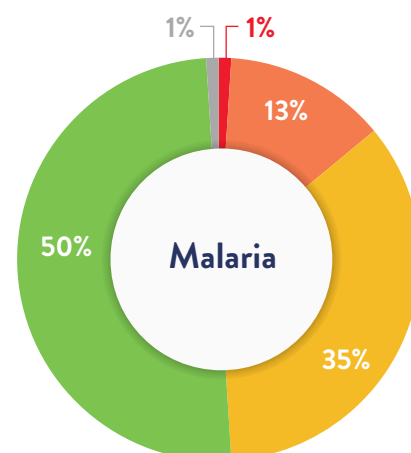
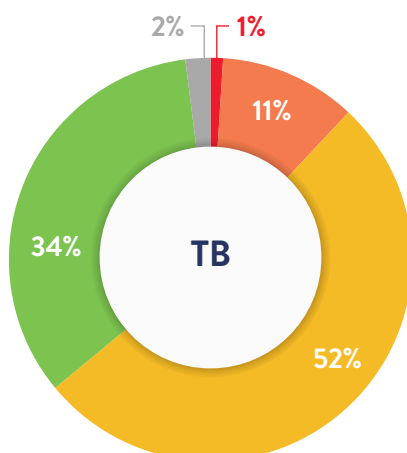
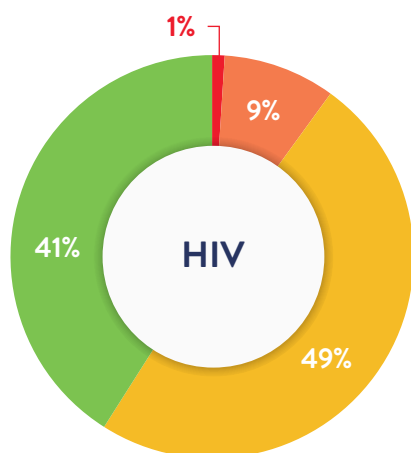
Average Score of Countries

—○— Malaria



## Latest Answer Distribution

(1 May)



■ Very high disruption

■ High disruption

■ Moderate disruption

■ No/low disruption

■ Don't know



# Senegal

**An evidence-based, data driven strategy leads to innovation and success**

At the turn of the millennium, Senegal had an extremely high burden of malaria and limited resources or systems to fight the disease. Through domestic leadership and partnership with the Global Fund to Fight AIDS, Tuberculosis and Malaria, the President's Malaria Initiative (PMI), and other global health and development organizations over the last two decades, Senegal decreased the number of malaria cases by 73 percent and malaria deaths by 13 percent between 2000 and 2019.

While Senegal is now widely seen as a model for its pioneering approach to tackling malaria, the country overcame fundamental challenges in program design and implementation in the early 2000s.

The infusion of funds from an initial Global Fund grant in 2003 provided the opportunity to scale up life-saving interventions like bed nets. But in 2004, the Global Fund paused funding to Senegal. The message was clear – making a meaningful impact on malaria would require a data-driven, evidence-based strategy.

“At this time, when our partners wanted to understand the impact of their investment, we couldn't provide any data on case numbers, on what had been distributed, nothing,” recalled Mame Birame Diouf, the former deputy coordinator of Senegal's National Malaria Control Program. “We had no data because we had no data system.”

Senegal responded by rapidly reorganizing its National Malaria Control Program and committing to an evidence-based, data-driven strategy. The government increased program staffing and strengthened capacity to ensure the team was capable of planning, implementing, monitoring and evaluating programs and interventions on both a national and community level. The foundation of this strategy was the nation's first malaria information system.

This national information system started with data from thousands of community health workers who used notebooks to track malaria diagnosis, treatment, and other prevention services. Over time, the system progressed from paper to excel spreadsheets. Today, Senegal uses a robust health information system that includes regular malaria indicator surveys and a web-based national platform.

“The issue of data was a turning point for us,” Diouf said. “Our partners needed information about their investment. We needed to see how we were progressing. Now, we are able.”

Over the last 15 years, financial and technical support from the Global Fund and PMI, along with increasing domestic financing, has helped Senegal establish itself as a global success story in the effort to end malaria. Senegal has increased access to the full range of powerful anti-malaria tools, from insecticide treated nets and rapid diagnostic tests, to seasonal malaria chemotherapy and anti-malaria medicine. For example, Senegal has distributed more than 46 million insecticide treated bed nets since 2004, each with a lifespan of up to three years. As a result, the percent of people with access to an insecticide treated bed net increased from 10 percent in 2005 to 73 percent in 2019.

Senegal has achieved progress not just by following data-driven best practices, but also by pioneering them.

In 2005, for example, scientists at Senegal's Cheikh Anta Diop University discovered that giving healthy children one dose of sulfadoxine-pyrimethamine and one dose of amodiaquine reduced the likelihood that children would contract malaria by 86 percent.

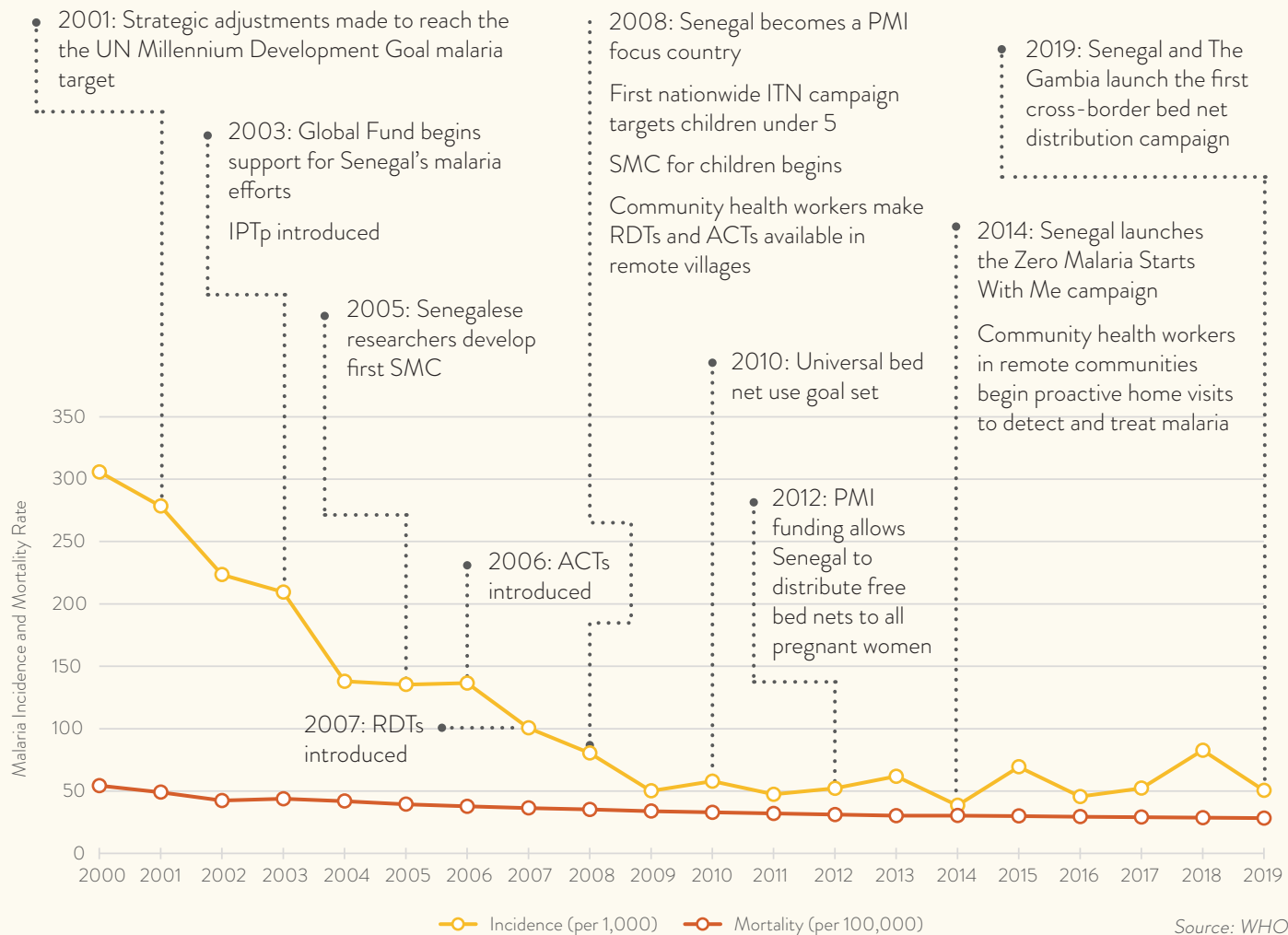
This discovery changed the course of the fight against malaria in Senegal, and by 2012, the innovation was part of the standard package of malaria interventions the WHO recommended across wide swaths of Africa's Sahel region. Now known as seasonal malaria chemoprevention (SMC), this combination of drugs currently protects more than 21 million children across 13 countries —including Senegal.

To reach communities with SMC and the full range of malaria control tools, Senegal trained thousands of volunteer community health workers.

Each year, these volunteers diagnose and treat millions of malaria cases, remind pregnant women to visit a health center to obtain malaria prevention treatment, and distribute SMC to all eligible children during malaria season, from July to November. They also serve as frontline data collectors who continually inform the country's malaria strategy.



## Senegal decreased the number of malaria cases by 73 percent between 2000 and 2019.



In 2014, with the support of President Macky Sall, Senegal became the first country to launch the “Zero Malaria Starts With Me” campaign, which encourages households, communities, and the private sector to take action to end malaria. By the end of 2020, 19 countries have followed Senegal’s lead and joined the campaign. The country partnered with Benin in 2020 to build on this success with the Zero Malaria Business Leaders Initiative, which aims to increase private sector involvement in and support for ending malaria.

Senegal is poised to continue its successful push against malaria with the aim of reaching malaria elimination.

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**“In my country, malaria has long been a major public health concern threatening the socio-economic development and structural transformation trajectory that has put our country on a firm path to sustainable development. It is through national ownership, shared responsibility, and global solidarity that we can defeat malaria for good.”**

— President Macky Sall of Senegal



# Uganda

## How significant investments helped turn the tide against malaria

In 2009, a national survey of children under the age of five in Uganda found that more than half (55 percent) had malaria – one of the highest rates in the world. Uganda’s children often contracted malaria five times a year, according to the Ministry of Health. Those that survived missed school an average of five days each time, setting back their studies, sometimes permanently. Likewise, their parents frequently contracted the disease, missing work. This cost the country’s economy an estimated US\$ 658 million each year between 2002 and 2005.

Significant U.S. investment in fighting malaria in Uganda has helped turn the tide, improving access to powerful anti-malaria tools and enabling the country to respond rapidly to new outbreaks. By 2014, only 30 percent of Ugandan children under five had malaria. Malaria incidence had declined even further by 2019, to a historic low of 17 percent. In fact, from 2000 to 2019, malaria incidence in Uganda fell by 46 percent and mortality dropped 83 percent.

The President’s Malaria Initiative (PMI) and the Global Fund to Fight AIDS, Tuberculosis and Malaria have worked with the Ugandan government to transform access to the full range of effective anti-malarial tools – including innovations like next-generation insecticide-treated nets. By 2019, 71 percent of people in Uganda had access to an insecticide-treated net. Eighty-nine percent of eligible women received at least one dose of IPTp, a medication to prevent malaria during pregnancy. Indoor residual spraying campaigns have expanded to protect more than four million people each year – one in 10 Ugandans. In 2020 alone, Uganda needed more than 30 million insecticide treated nets, nearly 29 million rapid diagnostic tests, and more than 18 million courses of treatment to address malaria.

Despite this impressive progress, a significant proportion of the global burden of malaria still occurs in Uganda, which sees five percent of global cases and three percent of global deaths. In early 2019, Uganda was the first of the 11 focus countries, which represent more than 70 percent of the global burden of malaria, to launch the High Burden to High Impact (HBHI) Approach with the WHO and the RBM Partnership to End Malaria. The approach focuses on translating political commitment into tangible actions, better use of strategic information to drive impact, implementation of the best global guidance, policies and strategies, as well as improved coordination.

Uganda’s launch of its multisector strategy in late 2019 helped to translate the HBHI approach into reality. The strategy cuts across government, the Ministry of Health, schools, the mining sector, the military, the private sector, and religious leaders. In schools, for example, children are given free insecticide-treated nets and taught about how they can prevent malaria by sleeping under their bed net, wearing long sleeves and long pants in the early mornings and evenings, and by draining mosquito breeding grounds. Teachers regularly ask students if they are using their mosquito nets and encourage children to

share the information they are learning about malaria with their families — which research shows can be a powerful force for behavior change.

“The idea is to create demand for antimalaria services,” said Jimmy Opigo, the Malaria Program Manager at Uganda’s Ministry of Health. “This makes eliminating malaria everyone’s responsibility. In the past, we made a mistake by focusing on treatment, not on prevention.”

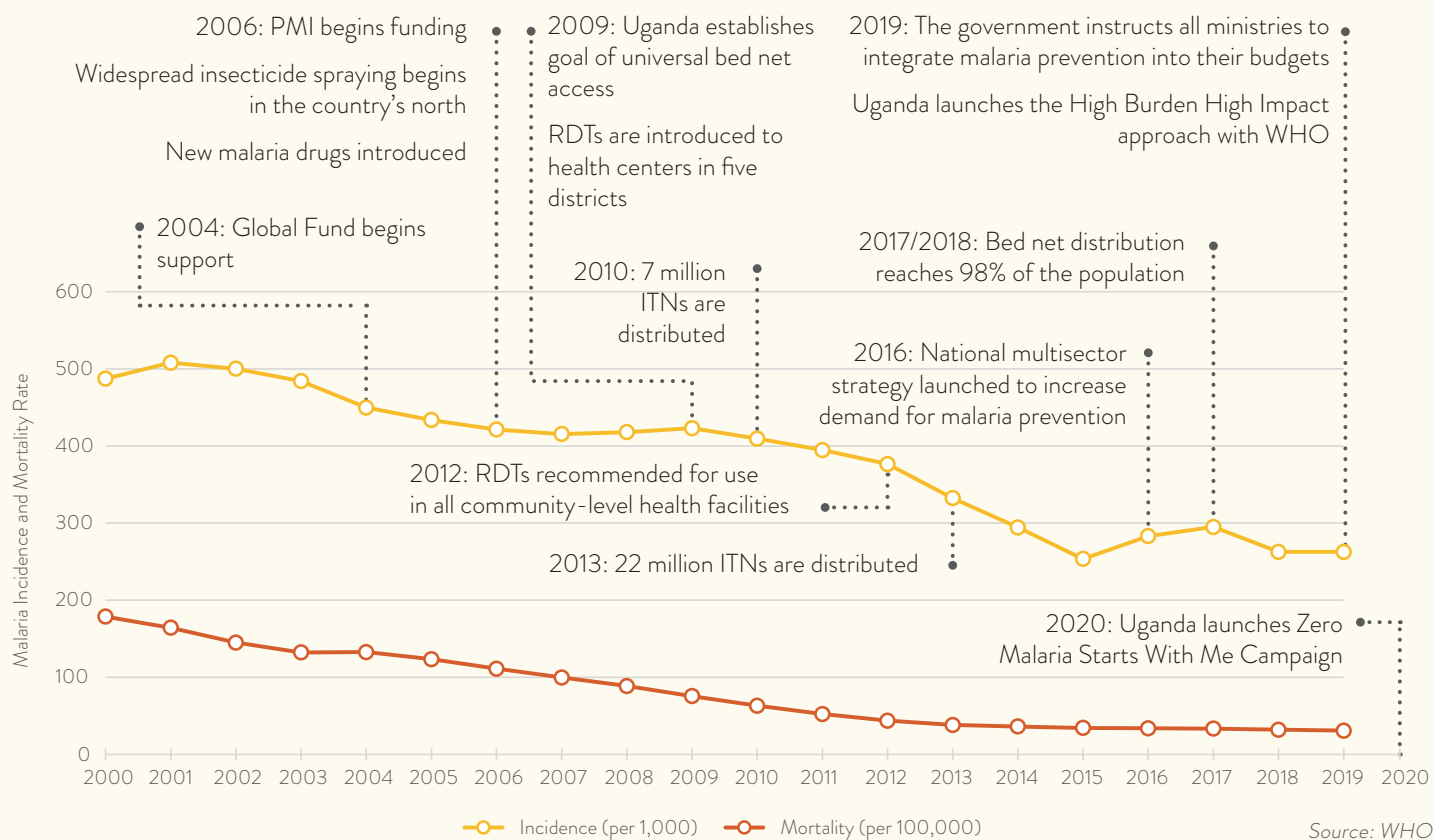
An early pilot of this school-based program found that it reduced student absenteeism by 40 percent. The program is now being further tested and rolled out across the country. To support this approach, the Ministry of Finance has directed all sectors to integrate malaria prevention activities into their workplans and budgets for the 2020-2021 fiscal year.

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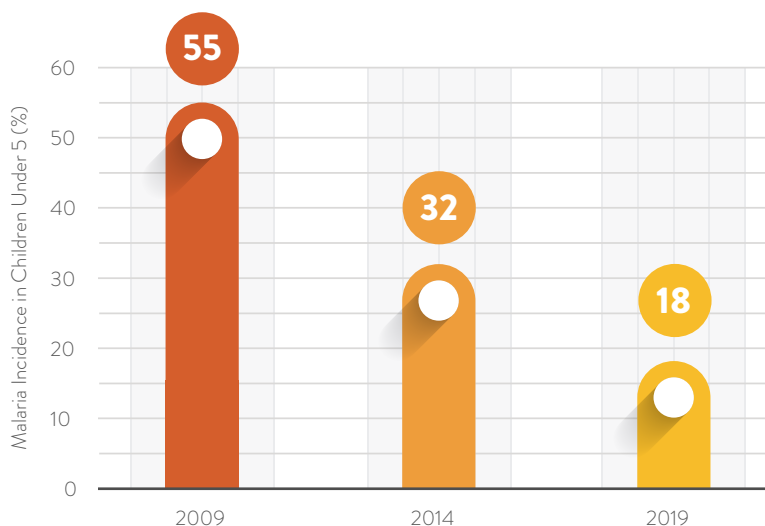
**If we don’t mobilize everybody and decentralize our efforts to every single school, business, community, and household, then we are wasting our time. Tourism operators are now spraying for malaria. Boarding schools are ensuring their students have nets. We are working to ensure everyone is taking responsibility for ending malaria.**

– Jimmy Opigo, Malaria Program Manager at Uganda’s Ministry of Health

## From 2000 to 2019, malaria incidence in Uganda fell by 46 percent and mortality dropped 83 percent.



**During the last decade Uganda made fighting malaria a top priority and the number of children under five with malaria dropped by 37 percent.**





# Ethiopia

## Community health workers lead the fight against malaria

The year 2004 proved to be a pivotal moment in the history of Ethiopia. The country, more than ten years removed from a devastating civil war, was still struggling to deliver basic healthcare to its citizens. A malaria epidemic raged across the country. Malaria case and mortality rates, maternal mortality, child mortality, and other important health indicators were among the worst in the world. Nearly half of all deaths in the country were due to malaria and other preventable and treatable conditions.

The challenges were easy to see: the country had only 300 to 400 health centers – most of them in urban areas – leaving rural Ethiopians with no access to even the most basic healthcare. The vast majority of people had no access to proven tools to fight malaria and the malaria parasite had developed resistance to sulfadoxine-pyrimethamine (SP), the first line drug treatment.

The country's leaders recognized that to make progress on malaria and other key health goals, they would need to broaden and strengthen the health system. With the support of the international community, they launched the country's first truly national health system capable of delivering primary health care and preventive care – including malaria prevention, diagnosis, and treatment – to every village and hamlet.

The backbone of this robust system, built from 2004 to 2008, is 16,000 new health posts staffed by a new corps of 40,000 prevention-focused community health workers (called “Health Extension Workers”). The health workers were trained to diagnose and treat malaria, identify mosquito breeding sites, distribute insecticide treated nets, and support household spraying campaigns. They connected thousands of remote communities across the country with the resources they needed to stop the malaria epidemics that had previously rolled through Ethiopia's countryside every six to eight years.

These investments would pay dividends and transform health outcomes – between 2005 and 2015, the percentage of children with fevers receiving antimalarial medications more than doubled and the proportion of people with access to an insecticide-treated net rose from 1.3 percent to 49 percent. The country achieved a 86 percent decrease in malaria-related deaths between 2000 and 2019.

Behind this historic success is robust U.S. funding and technical assistance from the President's Malaria Initiative (PMI) and the Global Fund to Fight AIDS, Tuberculosis and Malaria. From training healthcare workers to procuring insecticide-treated bed nets, anti-malarial medicine, and rapid diagnostic tests, U.S. partnership was pivotal.

Eager to expand on the success of the community health worker program and achieve its goal of malaria elimination, in 2011 Ethiopia launched another prevention-focused cohort – the Health Development Army. The army's members, three million women volunteers found in every village across the country, educate and encourage their neighbors to follow best practices to prevent malaria. This includes distributing and properly hanging insecticide-treated nets, identifying and eliminating potential mosquito breeding sites, and helping community health workers identify malaria cases.

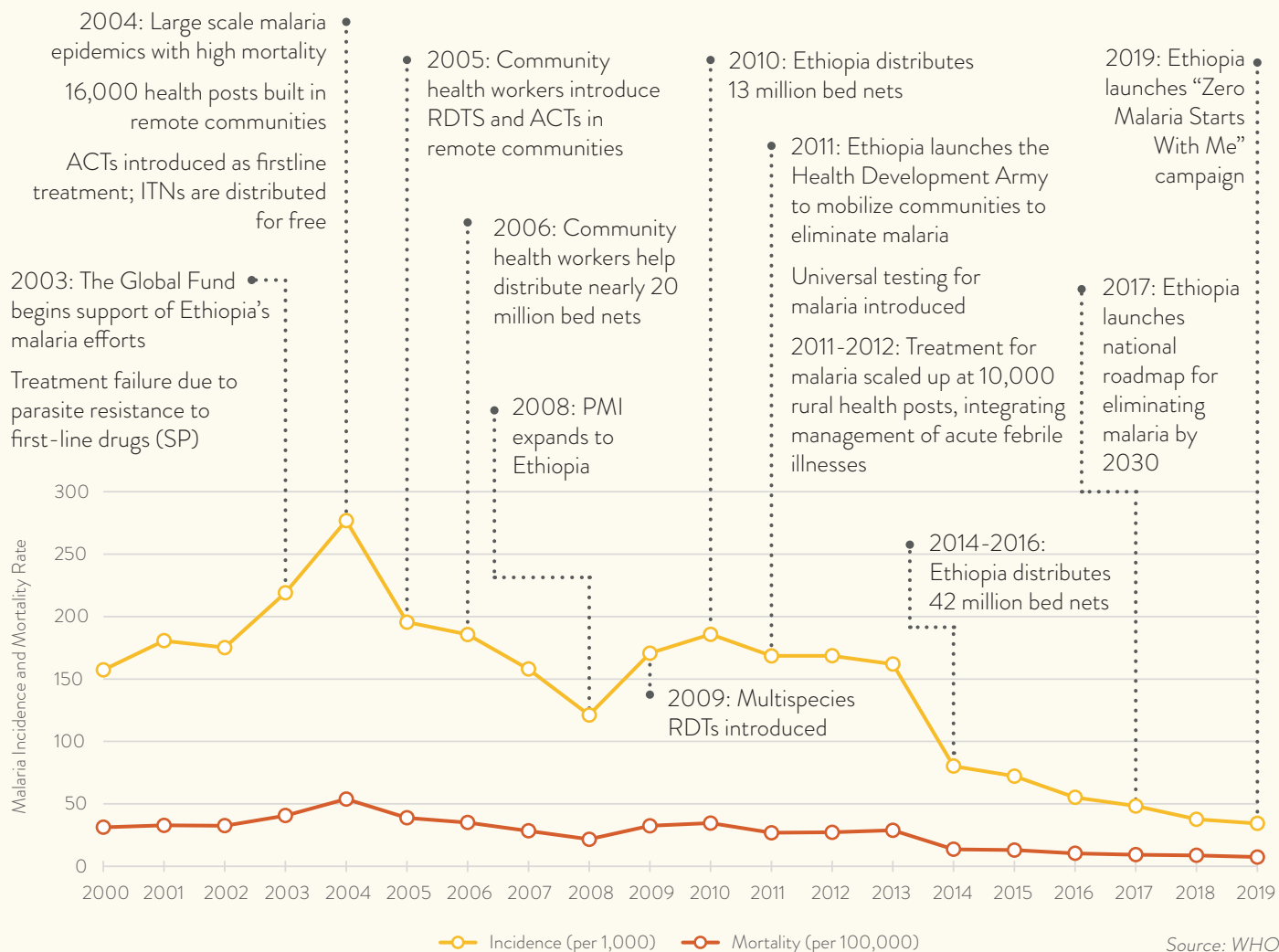
Today, the community health workers and their “army” continue to lead Ethiopia's fight against malaria. With continued funding and support from PMI and the Global Fund, each year Ethiopia's Community Health Workers administer millions of rapid diagnostic tests and doses of artemisinin-based combination therapies (ACT) to diagnose and treat malaria cases. Community health workers also serve as the frontline of the country's robust data system to detect, report, and monitor malaria cases – which declined by almost 87 percent between 2004 and 2019.

Assessing this progress, Ethiopia has set the ambitious goal of eliminating malaria within its borders by 2030 and the government has committed to continuing to increase domestic financing for the program.

**Ethiopia deployed a Health Development Army of three million women volunteers across the country to educate communities about malaria prevention.**



**Between 2005 and 2015, the percentage of children with fevers receiving antimalarial medications more than doubled and the proportion of people with access to an insecticide-treated net rose from 1.3 percent to 49 percent. Ethiopia achieved a 86 percent decrease in malaria-related deaths between 2000 and 2019.**



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**...to eliminate – and ultimately eradicate – malaria would pay a massive return on investment. Scaling up coverage of effective malaria control tools in the 29 highest-burden countries [which includes Ethiopia] would yield an estimated gain in Gross Domestic Product of 283 billion U.S. dollars – which is eight times more than the associated costs of 35 billion dollars. Our fight against malaria is therefore not just the right thing to do, it's the smart thing to do.**

*–Tedros Adhanom Ghebreyesus, WHO Director-General, former Ethiopia Minister of Health, who started his career in health as a malaria researcher*



# Greater Mekong Subregion

**A strong surveillance and case management strategy leads to success**

Malaria was prevalent throughout the Greater Mekong Subregion (GMS) at the start of the new millennium, particularly in the rural and border regions. Through concerted political efforts, namely investment paired with urbanization and improvements in the overall health system, the rates began to decline. But these early efforts were constrained by fiscal realities, as several of the countries within the GMS did not have necessary funding to combat the disease. The introduction of the Global Fund to Fight AIDS, Tuberculosis and Malaria in 2003 provided an influx of resources – including insecticide-treated bed nets (ITNs), diagnostic tools, and antimalarial treatments – for local governments.

With the scale-up of interventions, malaria rates plummeted across the region. Progress continued throughout the GMS until 2008 when a drug-resistant strain of malaria was confirmed along the Thai-Cambodian border. Drug resistance is not new to the region, where mutations within the parasite caused similar resistance to earlier generations of antimalarials like chloroquine and mefloquine. Scientists recognized that if the new resistant strain – this time to the drug artemisinin – started to spread, it could not only erase decades of hard-won progress but also increase malaria's death toll significantly, making malaria harder to fight everywhere.

To combat this emerging crisis, the Gates Foundation, the World Health Organization (WHO), and national leaders within the region decided to work collectively to hinder the spread of the drug resistant strain. The cross-border strategy sought to construct a firewall of interventions to contain it to the Thai-Cambodian border. Within the containment zone, the Global Fund and partners helped local governments establish monitoring networks and large-scale intervention delivery campaigns in hopes of neutralizing the strain.

Despite the coordinated efforts of regional leaders and global partners, those most at risk – itinerant workers on rubber plantations and in forests – unknowingly carried drug-resistant malaria parasites with them when they traveled outside of the containment zone. Within just a few years, artemisinin-resistant malaria was confirmed in five of the countries in the GMS (Thailand, Cambodia, Laos, Myanmar, and Vietnam).

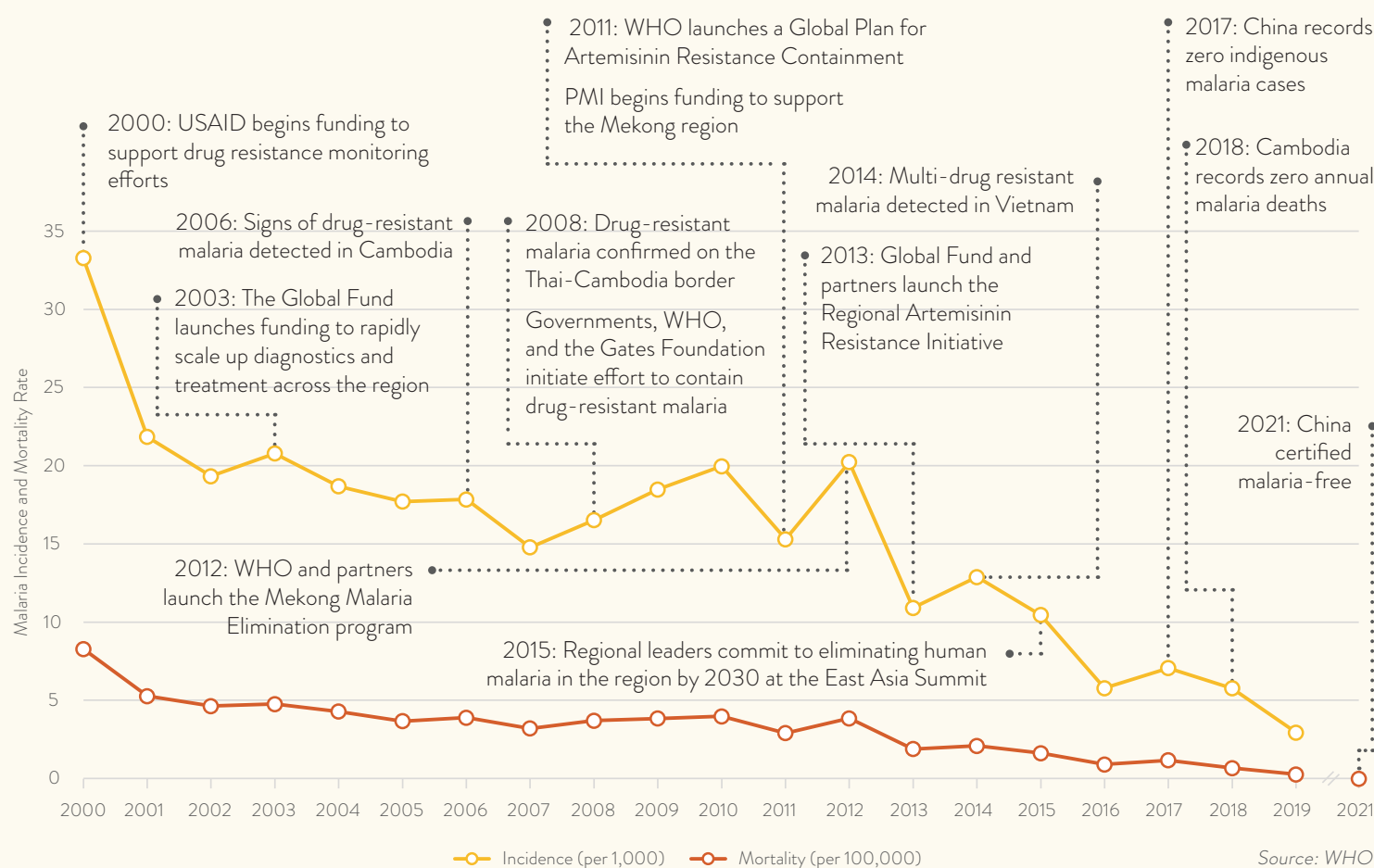
Although the containment strategy ultimately failed, the commitment to working on a regional level, with the support of global institutions, soon proved highly effective. By 2011, the WHO and regional government leaders shifted course, recognizing that the best way to limit the spread of the drug resistant strain was to eliminate malaria from the region entirely. The parties agreed to focus their efforts on eliminating *Plasmodium falciparum* – the species of the malaria parasite which had developed drug resistance in the region – by 2025 and all malaria species from the GMS by 2030. In the same year, the U.S. President's Malaria Initiative (PMI) expanded to include country programs within the GMS. The US-led program focused on drug resistance monitoring and improving the quality and use of case-based surveillance systems for action.

Today, the fight to eliminate malaria looks different in each of the GMS countries, but there are common themes throughout: unwavering local political commitment, data-driven flexibility, and, even in times of success, a continued sense of urgency. Working in tandem with these commitments are the robust donor funding and technical assistance from PMI and the Global Fund that ensure access to key interventions like ITNs, effective antimalarial medication, and rapid diagnostics and treatment.

In Cambodia, PMI and the Global Fund use innovative, data-driven strategies to reach last-mile populations still threatened by drug resistance. In rural villages, community health workers provide free screening and treatment, while their mobile counterparts provide the same care for workers on rubber plantations. PMI supported a malaria education campaign where motorcycle taxi drivers educated their passengers about malaria in high-risk areas. There have been no deaths from malaria since 2018, largely because of these wide-ranging efforts.

With support from PMI and the Global Fund, countries in the region – including Thailand, Lao People's Democratic Republic, and Cambodia – have adopted a simplified “1-3-7” surveillance and case management strategy first deployed in China. Within one day of reporting symptoms, individuals are tested, receive a diagnosis, and are added to the government's data system. Within three days, a team investigates to determine whether the malaria case is indigenous or imported. Within seven days, action is taken to address any outstanding issues (such as ensuring adequate ITN coverage and screening of populations around the index case).

## Malaria incidence across the GMS dropped 90 percent between 2000 and 2019.



This strategy, coupled with political commitment and strong partnership, has been game changing. Malaria incidence across the GMS dropped 90 percent for all types of malaria and 97 percent for *P. falciparum* malaria between 2000 and 2019. In the same time period, incidence rates fell 96 percent in Vietnam, 96 percent in Thailand, 95 percent in Myanmar, 95 percent in Laos, and 84 percent in Cambodia. China's Yunnan Province has already reported its third consecutive year without an indigenous case of malaria. China was certified malaria-free by the WHO in July 2021.

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**We are winning the battle. We are on the right track. The massive reductions in disease and death reported in GMS countries are a testament to the sustained progress that has been achieved along the path toward elimination in this subregion. It is only through eliminating this parasite that we will do away – once and for all – with the problem of drug resistance in this subregion.**

*Dr Pedro Alonso, Director, WHO Global Malaria Program*





# India

## Scaled up programming and domestic investments spur immense progress

In 1947, the year India declared its independence, 75 million of the country's 337 million citizens (roughly one in four) contracted malaria. In the ensuing decades, India had varying success in its malaria control efforts – nearly eliminating the disease in the 1960s but then experiencing a rebound in cases after funding was withdrawn from its malaria program<sup>1</sup>. At the turn of the millennium, there were 19.6 million cases of malaria each year.

In 2005, financing from the Global Fund to Fight AIDS, Tuberculosis and Malaria helped India scale up its malaria programming. This proved to the Indian government that reducing the burden of malaria was not only possible, but also provided a great return on investment, with each dollar invested bringing US\$36 in returns through improved health and economic activity. Today, domestic funding accounts for the overwhelming majority of India's malaria program resources. In fact, the domestic budget accounted for more than three-quarters of the overall contributions (US\$300 million) to malaria programs between 2017 and 2019 and continues to grow.

Between 2003 and 2019, malaria incidence fell 78 percent to 5.5 million cases a year and the mortality rate declined by 80 percent, despite significant population growth. Nowhere is this progress more impressive and noteworthy than in the state of Odisha, which has reached the most vulnerable communities with a suite of powerful antimalarial tools that include bed nets, diagnostics, treatment, and prophylaxis.

Odisha has long been responsible for more than a third of the country's malaria cases, although it makes up just four percent of India's land mass and three percent of India's population. The state's dense forests and poor tribal communities – who live widely scattered in tiny hamlets – combined with a low level of infrastructure make Odisha the perfect breeding ground for mosquitoes. The annual monsoon from June to September regularly washes out roads and bridges, floods communities, and can force both people and animals to migrate to higher ground – all of which makes the regular delivery of medicine and preventive care nearly impossible.

Two programs, both aimed at reaching the most remote and most vulnerable communities with proven interventions, helped Odisha reduce its incidence of malaria by 92 percent between 2003 and 2019. They are models for how to overcome logistical challenges that previously resulted in remote communities accepting malaria as an unavoidable force of nature.

The first program launched in 2010 when India began to train an existing group of volunteers called Accredited Social Health Activists (ASHAs) on how to identify and treat malaria. The ASHAs, who previously focused only on maternal and child health and had been instrumental in defeating polio, added free bed nets, malaria testing, and anti-malarial medicines to their services. Today, more than 45,000 ASHAs working in 56,000 villages across Odisha – along with 900,000 ASHAs across the rest of India – are delivering bed nets, educating their neighbors about their proper use, supporting indoor residual spraying campaigns, and offering free malaria diagnosis and treatment.

In 2017, India launched a second program to reach even deeper into Odisha's forested hills. Durgama Anchalare Malaria Nirakarana' (DAMaN), which translates in English to "Malaria Elimination in Remote Areas," organizes 5,000 to 6,000 massive screening events twice each year in the most inaccessible and highest risk forested areas of Odisha. These extraordinary screening events test the entire population of some 7,000 far-flung villages – between 1.2 and 1.5 million people – just before

and just after the monsoon to catch malaria cases before the rains spark outbreaks. The screenings are led by ASHAs and supported by more than 100,000 volunteers across the state who have been trained to test and treat malaria and help detect asymptomatic cases of the disease. This is critical because asymptomatic cases serve as a reservoir of the disease in each community, undermining efforts to end malaria. When both symptomatic and asymptomatic cases are detected and treated, the entire community is finally free of malaria and the country can move forward towards eliminating the disease – a goal now within sight.

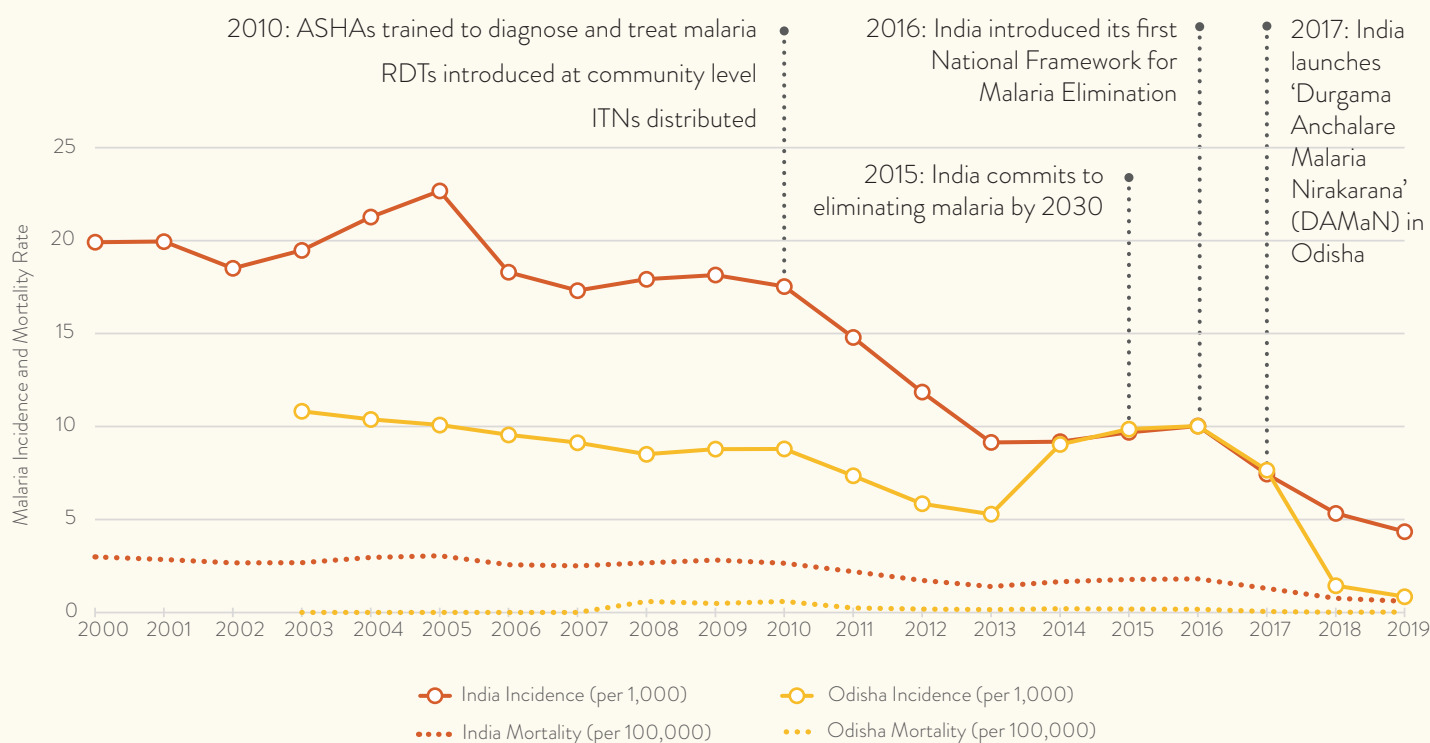
“

**In India, there is firm commitment to ending malaria... Because the government knows that it is malaria that keeps us poor.**

– Dr. Sanjeev Gaikwad, Country Director,  
*Malaria No More India*

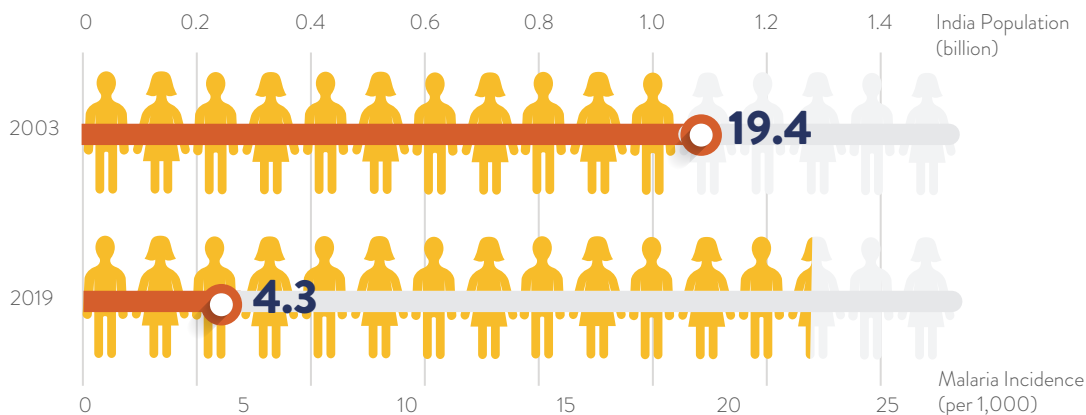


**Programs aimed at reaching the most remote and most vulnerable communities with proven interventions helped Odisha reduce its incidence of malaria by 92 percent between 2003 and 2019.**



Source: India national data is from WHO; Odisha data is from NIH, Statista, NHM of India and Census 2011

**Between 2003 and 2019, malaria incidence fell 78 percent to 5.5 million cases a year, despite significant population growth.**





# El Salvador

## The journey from malaria hotspot to malaria-free zone

In 2021, El Salvador, a historically malaria-endemic country, marked a major milestone in its decades-long fight against malaria; it received World Health Organization (WHO) malaria-free certification. The country's journey from malaria hot spot to malaria-free zone demonstrates how investments in a data-driven strategy combined with aggressive monitoring led by local communities can accelerate progress.

El Salvador began its efforts against malaria in 1945, with the first indoor residual spraying campaign in malaria-endemic areas of the county. In 1955, El Salvador launched the first antimalarial national campaign and established a network of trained Community Volunteers (CoVols) to support malaria diagnosis and treatment throughout the country. By the 1970s, 10 percent of the Ministry of Health's budget was allocated to malaria activities, boosting control efforts.

In 1978, El Salvador made a decision that would propel it along a new trajectory. In partnership with the U.S. Centers for Disease Control and Prevention (CDC) and the U.S. Agency for International Development (USAID), El Salvador's health officials launched an ambitious nation-wide data review to determine, as precisely as possible, where malaria was most present and problematic. The exercise revealed why the country was having trouble fighting malaria: the CoVols were mostly located in areas with little to no malaria.

In response, the government adopted a more-data driven strategy. The malaria program and laboratory networks were decentralized, promoting the integrated management of all malaria activities in high burden areas. Health officials also channeled more resources to the disease, such as laboratories and CoVols, as well as targeted activities to high-risk areas. Within a few years of these adjustments, the number of cases began a precipitous drop – falling 90 percent between 1980 and 1990.

El Salvador established an electronic national epidemiological surveillance system in 1990. This move allowed El Salvador to continue improving data-based targeting of malaria interventions to specific areas and populations, along with the expansion and strategic allocation of CoVols, ensuring that 100 percent of cases were confirmed through quality diagnostic testing. By 1995, El Salvador reached a historic milestone – it reported its last death from malaria.

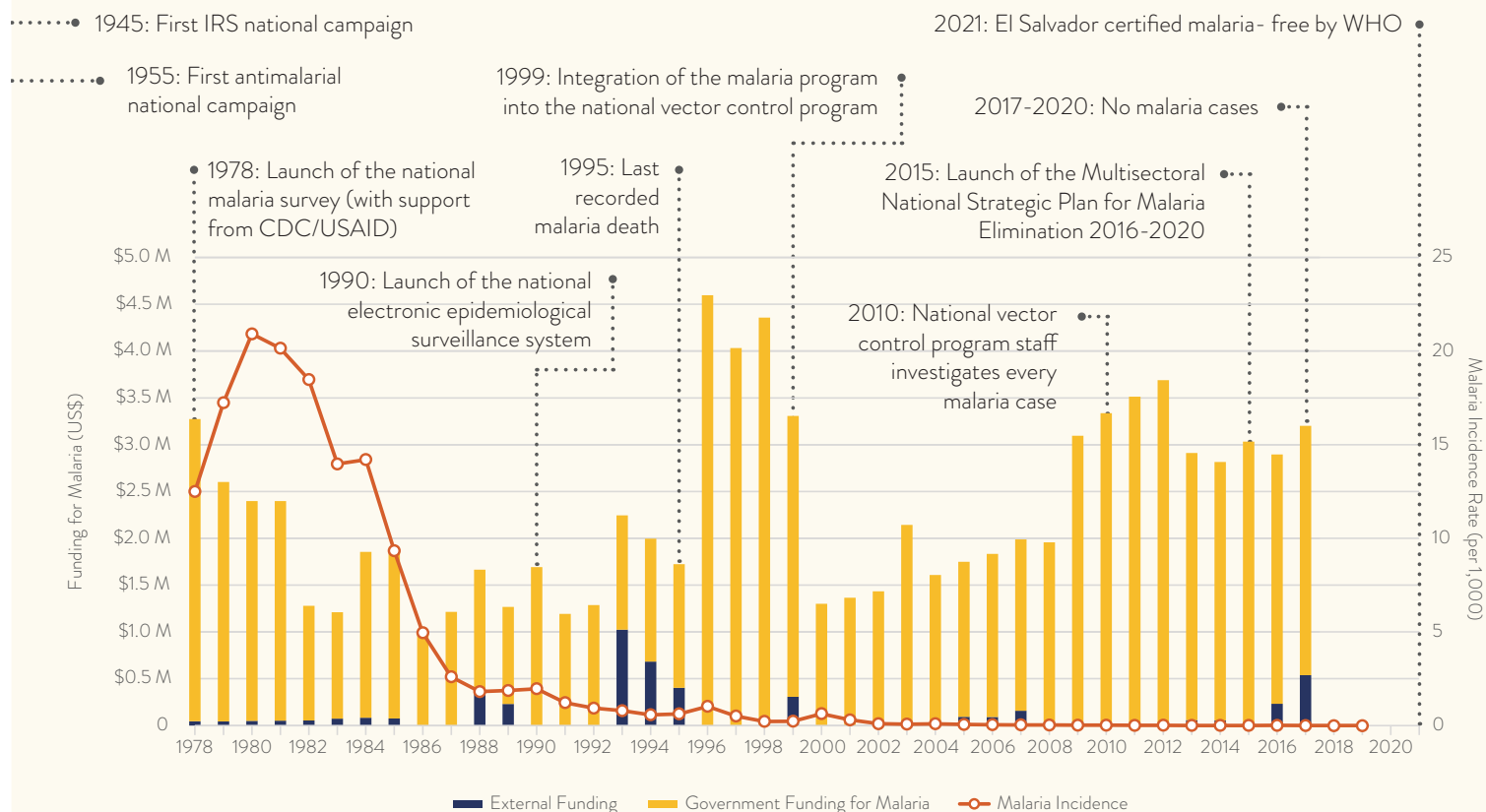
When the malaria program was integrated into the larger national vector control program in 1999, the number of staff working in the field of malaria-related activities, from vector control technicians to CoVols, increased to more than 5,000. The private sector was also successfully integrated into the response and started systematic reporting of cases to the government. By then, health authorities had a complete picture of how malaria transmission occurred throughout every corner of the country.

By 2006, El Salvador had less than 50 malaria cases annually. By 2010, when cases had reached historic lows, vector control staff were tasked with investigating every single case of malaria. Within 72 hours of case confirmation, health brigades visited each patient's family, neighbors, and work to identify others who may be infected and to locate mosquito breeding sites. In 2015, El Salvador launched the Multisectoral National Strategic Plan for Malaria Elimination 2016-2020, integrating malaria activities with health promotion and illness prevention, community participation, and monitoring of disease trends and the mosquito population.

**El Salvador decentralized its malaria program and laboratory network and channeled more resources to fighting malaria in high-risk areas.**



## El Salvador demonstrates how investments in a data-driven strategy – combined with aggressive monitoring led by local communities – can accelerate progress.



Source: 1978-1999 national data from PAHO; 2000-2019 data from WHO

When malaria cases reached zero in 2017, political commitment towards elimination stayed strong. Today, the country continues to allocate domestic funds to prevent the reestablishment of transmission, including funds to maintain passive surveillance, diagnostic quality assurance, and technical training to maintain the capacity of vector control, laboratory staff, ColVols, and health care providers.

While the fight against malaria in El Salvador has been largely funded through domestic resources, the technical support and smaller catalytic investments from partners such as Pan American Health Organization (PAHO); WHO; the Global Fund to Fight AIDS, Tuberculosis and Malaria; CDC and USAID; and the Inter-American Development Bank boosted key interventions and enhanced regional collaboration to accelerated malaria elimination.

Today, a national network of ColVols, vector control staff, laboratory staff, nurses, and physicians – all supported almost exclusively through domestic funding – still stand ready to investigate, diagnose, treat, and document any suspected case of malaria.

**When malaria cases reached zero in 2017, political commitment towards elimination stayed strong. Today, El Salvador continues to allocate domestic funds to prevent the reestablishment of transmission.**

# Looking ahead to 2030 targets

Since 2000, we have cut the incidence rate of malaria by nearly 29 percent and reduced the malaria mortality rate by 60 percent, despite a doubling of the population across sub-Saharan Africa. During these same two decades, 21 countries have reached zero malaria cases and 10 have been certified by the World Health Organization (WHO) as malaria free. Another 27 countries now report fewer than 100 indigenous cases each year – signaling elimination is within reach.

But despite this progress, we have fallen short of our 2020 milestones for mortality and incidence. Moreover, we may fall short of our targets for 2030 – to reduce malaria cases and deaths by 90 percent and eliminate malaria in 35 countries – if funding, political commitment, or technological innovations lag.

Our global fight against malaria is a relatively recent one. In 1999, total funding for fighting malaria around the world was just \$33 million. Many countries, even those plagued by high rates of malaria, had no malaria control programs in place. They did not have the funding and, in many cases, the technology was not yet developed to support their efforts.

New scientific advances and the commitment of partners around the world mean that we have an opportunity today to not just further shrink malaria's footprint in the world, but also to end it. The immense progress highlighted in this report – in El Salvador, Ethiopia, India, the Greater Mekong Subregion, Senegal, and Uganda – demonstrates that rapid improvement is possible even in some of the most high-burden places on earth. But we must ensure that health systems are empowered to reach communities with a full toolbox of powerful anti-malaria innovations.

To make further progress globally, we will need to increase our investments to cover last mile challenges in some of the most vulnerable corners of the globe. We need to ensure that bed nets are delivered in conflict-affected settings, such as Congo and Mali; that treatment is accessible in hard-to-reach indigenous communities, such as those in India and Ecuador; and that investments in developing game-changing innovations continue.

Today, scientists around the world are at work on revolutionary innovations, such as:

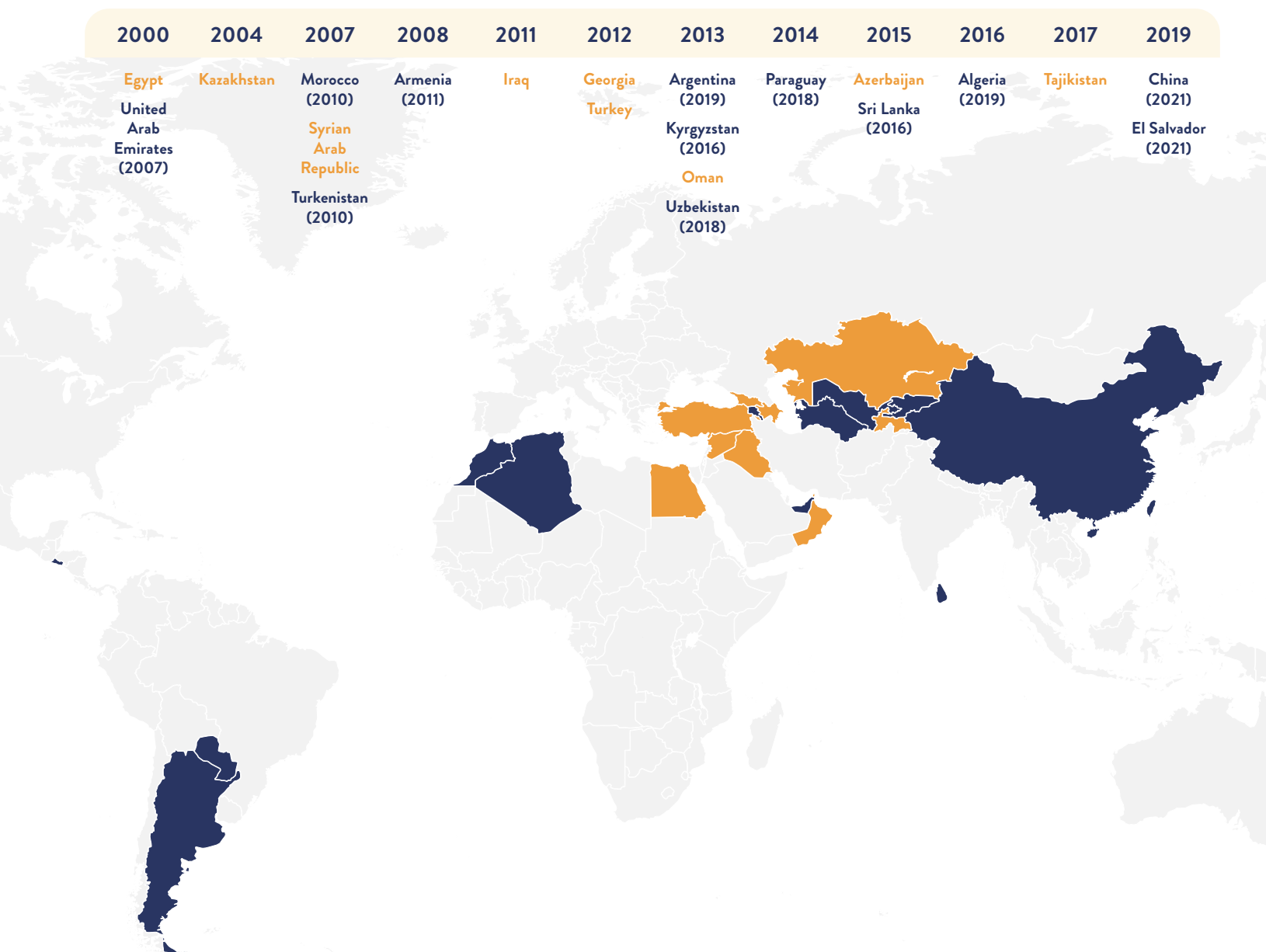
- Bed nets that are more effective against insecticide resistance, such as pyrethroid-PBO and dual active ingredient nets
- Longer lasting insecticide-treated nets
- Monoclonal antibody treatment to prevent malaria
- Genetically modified mosquitoes
- Malaria vaccines, now undergoing pilot trials in Ghana, Kenya, and Malawi

U.S. and global partners currently dedicate roughly \$3 billion to ending malaria annually – less than half of the estimated amount needed to end a scourge that undermines economic development in many parts of the world and robs the youngest of their future. But with right investments, scaled up interventions, and continued innovation, we can *end* malaria within a generation.

**Today the US and global partners dedicate roughly \$3 billion to ending malaria annually – less than half of the estimated amount needed to achieve this goal. Doubling that investment would strengthen health systems the world over and end a scourge that undermines economic development in many of the poorest areas of our planet and robs the youngest of their future.**



## COUNTRIES ELIMINATING MALARIA SINCE 2000\*



\* Countries are shown by the year that they attained three consecutive years of zero indigenous cases. Countries that have been certified as malaria free are shown in navy with the year of certification in parentheses.

Sources: Country report and WHO.

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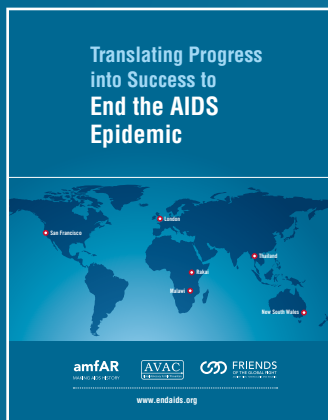
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## Additional Reports

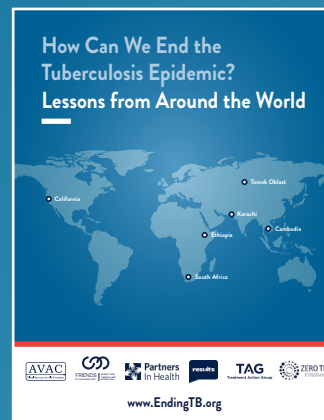


### **The AIDS epidemic can be ended.**

That is not a fantasy — it is a matter of choice. Policy makers, researchers and communities can end the AIDS epidemic in our cities, our countries and in our world. Some places are doing it already.

We must learn from these successes and demand the investment and policies needed to end the AIDS epidemic.

**[www.endaids.org](http://www.endaids.org)**



### **TB is curable. We need renewed and sustained political will to combat this epidemic.**

It can be easy to forget that until COVID-19 began its onslaught, tuberculosis (TB) was the leading infectious disease killer of adults worldwide.

Despite the numbers, we know we can end the TB epidemic. It is a matter of scaling up effective programs, dedicating sufficient resources and mobilizing the political will.

**[www.endingTB.org](http://www.endingTB.org)**

**[www.endingmalaria.org](http://www.endingmalaria.org)**



**FRIENDS**  
OF THE GLOBAL FIGHT

AGAINST AIDS,  
TUBERCULOSIS  
AND MALARIA

**malaria**  
**NO MORE**

**UNITED NATIONS**  
**FOUNDATION**

October 2021