

**Regional Artemisinin Resistance Initiative**

# **Eliminating Malaria in the Mekong**



## Introduction

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The Global Fund established the Regional Artemisinin-resistance Initiative (RAI) in 2014 in response to the emergence of drug-resistant malaria in the Greater Mekong Sub-region.

In 10 years, RAI has made remarkable progress in eliminating *P. falciparum*, the deadliest malaria parasite. Through RAI in Cambodia, the Lao People's Democratic Republic (Lao PDR), Myanmar, Thailand and Viet Nam, the number of malaria cases have been reduced from nearly half a million in 2010 to 247,769 confirmed cases in 2023, 228,567 of which were reported in Myanmar. Only 39,755 malaria cases in the region were caused by the *P. falciparum* parasite – 39,020 in Myanmar and the other 735 in Cambodia, Lao PDR, Thailand and Viet Nam.<sup>1</sup> Furthermore, the efforts made in the region to provide access to quality drugs, early diagnosis and treatment of malaria and appropriate surveillance of drug efficacy have helped reverse antimalarial resistance.

Though malaria cases have been reduced in the region, the fight is not yet won. The parasite persists in areas with dense forest cover and among mobile and migrant populations, who are not easily reached by conventional measures to combat the disease. The increase in reported cases in Myanmar – and the spillover of malaria cases to Thailand as the result of Myanmar's current political instability – additionally demonstrate the ripple effect of decreasing malaria control and elimination measures.

### Key malaria results for 2021–2023 in RAI countries:

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## 6.1 million

mosquito nets distributed.

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## 18 million

suspected malaria cases that received a parasitological test

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## 357,000

cases of malaria treated.

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**With the support of RAI, many sub-national areas have already reduced their malaria burden drastically, even to zero.**

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<sup>1</sup> Source: WHO 2024 release, Mekong Malaria Elimination Programme Epidemiology Summary, Volume 58, October 2024

## Background

Artemisinin is the main active pharmaceutical ingredient in many antimalarial medicines. Artemisinin resistance was first documented along the borders of Thailand with Cambodia and Myanmar in 2007, and in 2008 the first reports of artemisinin resistance emerged from western Cambodia. In the space of only a few years, the Greater Mekong Sub-region – home to over 300 million people – became the global epicenter of multidrug-resistant *P. falciparum*, including increasing resistance to artemisinin-combination therapies (ACTs), which combine artemisinin with partner drugs. The lessons learned in reversing antimalarial resistance in the Greater Mekong Sub-region are critical to inform the fight against increasing antimalarial resistance in Africa.

Over the last decade, the Global Fund has invested US\$731 million in RAI, which has helped to successfully eliminate malaria from a significant amount of the Greater Mekong Sub-region. Today, the disease still poses a significant threat to people living in remote, hard-to-reach areas along the region's densely forested border regions, including:

- **People working in informal occupations in rural settings.**
- **Ethnic minority populations.**
- **Mobile populations.**
- **Migrant populations.**
- **Forcibly displaced populations.**



Rubber plantation workers at Sol Sophea worksite, Stung Treng Province Cambodia.

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## RAI's regional structure

Key to the success of RAI has been its regional approach. RAI's Regional Steering Committee is the grant's central governance mechanism (following the Global Fund model of Country Coordinating Mechanisms) that provides grant oversight, strategic guidance and partner coordination. RAI's Regional Steering Committee includes:

- **Ministries of health.**
- **National malaria control programs.**
- **Civil society organizations.**
- **Private sector.**
- **Technical partners.**
- **Academia.**
- **Regional multilateral organizations.**
- **Key development partners.**
- **Grant Principal Recipient UNOPS.**

RAI's progress is evaluated by an independent monitoring panel of experts who assess key technical aspects of the program's different components, and propose guidance on how to tailor technical approaches to make them more effective and impactful. While RAI is a complex initiative, it is highly cost-effective by decreasing the financial burden on health systems to manage malaria. Elimination, once achieved, will provide even deeper cost reductions.

The regional approach offers value for money by accelerating the pace at which lessons learned are communicated and taken up from one country to another.

The Global Fund partnership is committed to **reaching those most affected by malaria in the region in our effort to leave no one behind.**

## Activities

RAI's efforts to curb malaria transmission emphasize early diagnosis and treatment focused on hard-to-reach populations – requiring close collaboration between national malaria control programs, community and civil society organizations and the private sector. Strategies to accelerate malaria elimination are often implemented in those same hard-to-reach areas. To do this, implementation activities include:

- An extended and well-organized network of community health and mobile malaria workers.
- Malaria case management at the community level, in community health facilities, larger health centers and private sector health facilities.
- Distribution of long-lasting insecticide-treated nets (LLINs) by risk stratification, including specialized hammock nests for forest-goers.
- Provision of indoor residual spraying and personal repellents.
- Health education in high-risk villages.
- Testing innovative, approved drug regimens for drug-resistant malaria.
- Digitized surveillance and response systems, including integrated surveillance on drug efficacy and reactive, active and passive case detection.
- Chemoprevention in specific risk groups, targeted drug administration and intermittent preventive treatment.

## Community engagement

RAI's success is driven by a robust community engagement process that includes tailoring approaches to local cultural and social norms and integrating the views and needs of communities into decision-making processes; this engagement is an essential component of any effective malaria program.

RAI has built a community-level network of more than 35,000 malaria workers – also called village malaria workers – to provide services in the communities they know best, under the supervision of national malaria control programs. Village malaria workers test for malaria with a rapid diagnostic test in patients with fever and either provide treatment directly or refer test-positive cases to health facilities for treatment.

The 50+ civil society organizations allied with and implementing RAI stay in touch through a dedicated platform that allows them to communicate, promote best practices, harmonize and coordinate activities.



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**Sai Ky**, a Laotian forest worker, is screened for malaria at the Srae Chamapa Malaria Post on the Cambodia-Laos border.

## Impact within the Greater Mekong Sub-region



A key impact of RAI has been the sustained access to effective antimalarial treatment, reducing both individual morbidity and mortality as well as malaria transmission at the population level. Additionally, RAI has supported countries in the Greater Mekong Sub-region in routinely assessing antimalarial drug efficacy to select and assure the availability of the antimalarial most effective for their context and reverse widespread drug resistance.

- There has been a 43% reduction of malaria caused by *P. falciparum* and mixed plasmodium species from 214,087 in 2014 to 43,418 in 2023, with an even more pronounced reduction in Cambodia, where there have been no reported cases since December 2023 and in Thailand, Lao PDR and Viet Nam where there was a total of 853 reported cases in 2023.
- Cambodia, Lao PDR and Viet Nam are well on track to

achieve malaria elimination and have set a goal of eliminating *P. falciparum* by 2026 and all Plasmodium species by 2030.

- From 2019 to 2023, the total number of reported annual cases, and in particular the number of *P. falciparum* cases, in the eastern Greater Mekong Sub-region have rapidly been reduced.
- In 2023, Cambodia, Lao PDR and Viet Nam reported just 34, 93 and 143 cases of *P. falciparum* respectively, and since January 2024, Cambodia has not recorded a single case of *P. falciparum*.

Although *P. vivax* and *P. falciparum* are the principal malaria-causing species in the Greater Mekong Sub-region, the other species of human malaria, principally *P. malariae* and *P. knowlesi*, continue to cause morbidity. *P. knowlesi* is of particular concern, as it may be misdiagnosed by conventional microscopy and undetected by rapid diagnostic tests, and thus underreported, and because its

natural reservoir is in macaque monkeys, unlike the other human malaria species.

In contrast with the eastern Greater Mekong Sub-region, Myanmar and neighboring border areas have had a resurgence of malaria transmission, reversing the strong reduction in malaria cases before 2021. Increased conflict in Myanmar has resulted in health system collapse and population displacement within the country and across the borders to Thailand, India, Bangladesh, Lao PDR, and China, leading to an increase in imported cases in these countries. Furthermore, in Myanmar, many more cases are going undetected than before and the actual increase in malaria burden may be significantly higher than reported. Within Myanmar, on-the-ground partners continue to provide case management and vector control, but their activities are hampered by the security situation and malaria commodity distribution issues.

## Global importance

RAI serves as an important model for other areas approaching malaria elimination or facing drug-resistant malaria. Over the last few years, artemisinin partial-resistant *P. falciparum* malaria has emerged in several African countries, including confirmed resistance in Eritrea, Rwanda, Uganda and Tanzania and suspected resistance in Ethiopia, Sudan, Namibia and Zambia.

- Eliminating malaria generates huge savings across countries and regions by saving lives and removing a drain on resources.
- Continued investment in malaria programs is important as countries approach and even achieve elimination to prevent the disease's reestablishment. Reductions in external donor investment must be accompanied by efforts to ensure financial and programmatic sustainability through country ownership and domestic financing. In the case of regional approaches, this sustainability must also cover governance structures, mechanisms for regional dialogue and community health networks.
- Integrating malaria services into health systems is critical for effective surveillance and response systems. Additionally, a range of available diagnostics are also needed to prevent the increase or reestablishment of malaria.
- A key component is a well-designed package of interventions implemented largely by a network of village and mobile malaria workers.
- Health policy in areas where resistance emerges must be continuously updated to ensure that health providers know which first-line ACTs are the most effective in a given country to prevent increases in malaria transmission.
- The regional approach, with oversight by the multi-stakeholder Regional Steering Committee and inter-country accountability on top of national oversight mechanisms, can be an effective organizational model to respond to changes in drug resistance and epidemiology swiftly and decisively.
- Political commitment is critical for malaria elimination. It affects all other factors – investment, integration, program design, policy and collaboration with regional actors.



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Slides are examined in a rural health center in Xwe Lay Village, Kayin State, Myanmar.

## Accelerating progress

The success and achievements of RAI in Cambodia, Lao PDR, Myanmar, Thailand and Viet Nam must be protected. We must not take our foot off the pedal. We must invest more. We must stop at nothing to ensure that the gains we have made are sustained. This will help us eliminate malaria in the region and mitigate the threat of spreading artemisinin resistance across the globe.

### About the Global Fund

The Global Fund is a worldwide partnership to defeat HIV, TB and malaria and ensure a healthier, safer, more equitable future for all. We raise and invest more than US\$5 billion a year to fight the deadliest infectious diseases, challenge the injustice that fuels them, and strengthen health systems and pandemic preparedness in more than 100 of the hardest hit countries. We unite world leaders, communities, civil society, health workers and the private sector to find solutions that have the most impact, and we take them to scale worldwide. Since 2002, the Global Fund partnership has saved 65 million lives.