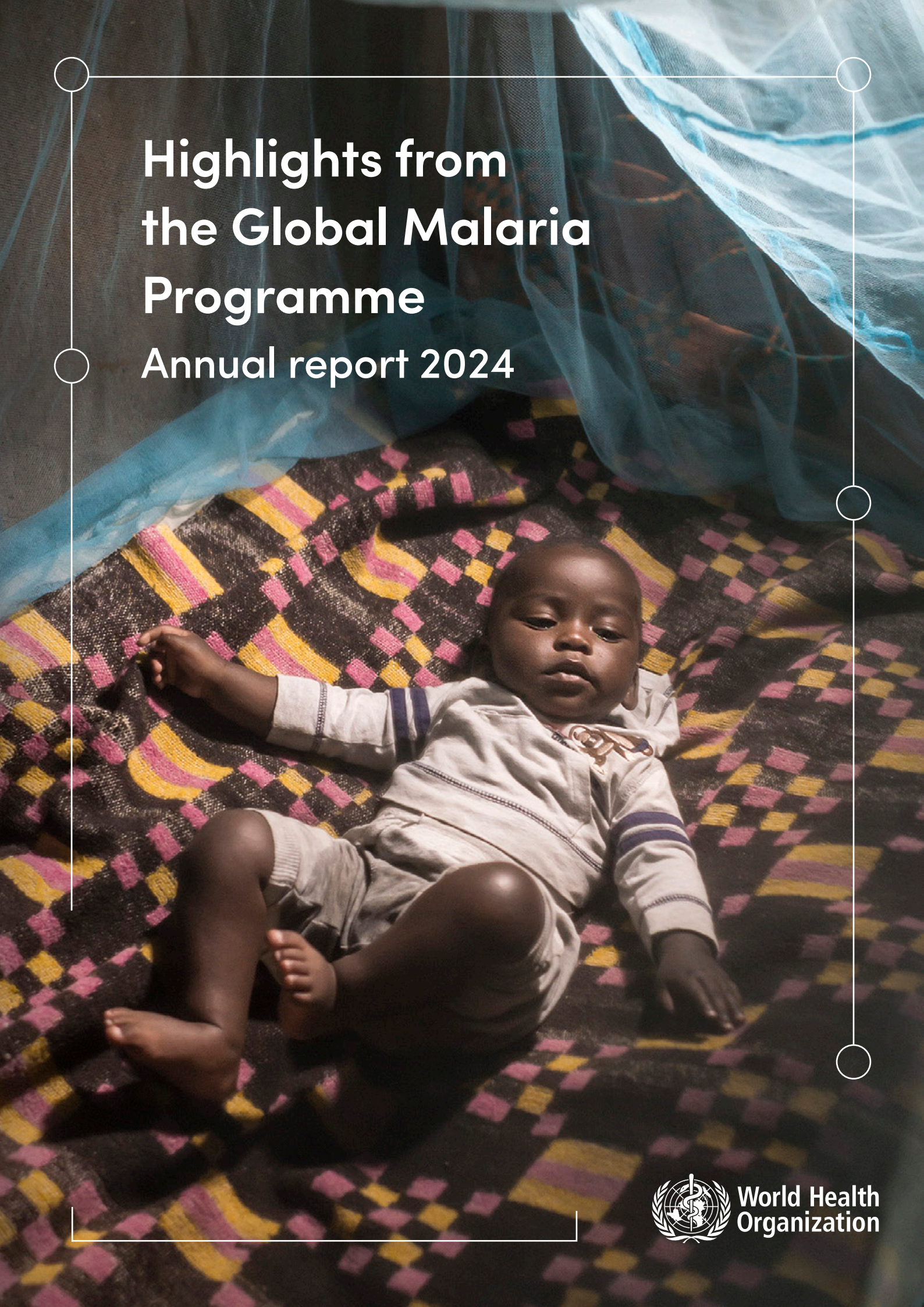
Highlights from the Global Malaria Programme

Annual report 2024



World Health Organization

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Cover photo: Caption: An infant sleeps under an insecticide-treated net in Kisumu, Kenya. In 2023, children under the age of five accounted for an estimated 76% of malaria-related deaths in the WHO African Region; credit: © WHO/Sven Torfinn.

Contents

Foreword

Investments in the global malaria response continue to deliver impressive returns. According to the latest *World malaria report*, more than 177 million cases and 1 million deaths were averted worldwide in 2023. Of the 83 malaria-endemic countries, 25 reported fewer than 10 cases, while many others made significant strides towards elimination.

In the African Region, which bears about 95% of the disease burden, many countries have expanded access to preventive malaria therapies for children and pregnant women recommended by the World Health Organization (WHO). Notable progress has also been made in the provision of timely diagnosis and treatment for at-risk populations. Meanwhile, the wider deployment of new-generation nets and vaccines is poised to accelerate reductions in the disease burden.

But countries are grappling with persistent challenges. Fragile health systems, weak surveillance, funding gaps and rising drug and insecticide resistance continue to hinder progress. Many high-risk groups miss out on the services they need to prevent, detect and treat the disease. Compounding these threats are the overlapping impacts of conflict and violence, natural disasters, climate change and population displacement.

The numbers speak for themselves. In 2023 alone, there were an estimated 263 million new cases of malaria – an increase of 11 million over the previous year – and about 597 000 deaths. Beyond its devastating health impacts, malaria upends lives and weakens communities, deepening social and economic inequalities. With proven prevention and treatment tools readily available, such a toll is simply unacceptable.

Amid a standstill in progress, and to support a more effective response, the Global Malaria Programme unveiled a new operational strategy describing its technical direction for the period 2024–2030 and its role in advancing the broader WHO *Global technical strategy for malaria 2016–2030*. The operational strategy focuses on four key levers to accelerate responses worldwide: technical leadership, norms and standards, new tools and innovation, and strategic information for impact. This report documents the progress made in rolling out the strategy in its first year.

In 2024, Ministers of Health from 11 high-burden African countries signed the Yaoundé Declaration, committing to a series of actions to accelerate reductions in malaria mortality. This milestone reinforced previous pledges from African political leaders under the country-led "High burden to high impact" initiative, injecting renewed momentum into malaria response efforts across the region. I am immensely proud of the role played by the Global Malaria Programme in catalysing and co-hosting the Malaria Ministerial Conference in Yaoundé, working in close collaboration with the Government of Cameroon, the WHO Regional Office for Africa and a range of external partners.

Each year, the Programme helps to steer the global malaria narrative by defining the annual theme for the *World malaria report.* The 2024 edition turned a spotlight on inequity, urging more inclusive and targeted action to protect those most vulnerable. Developed in partnership with the WHO Programme for Gender Equality, Human Rights and Health Equity, as well as external experts, the analysis underscored the importance of primary health care and the pressing need for more robust data systems to track and mitigate health disparities.

The global malaria response relies on WHO's rigorous, evidence-based technical guidance. In May 2024, the Global Malaria Programme released a highly anticipated set of guiding principles to help countries prioritize malaria interventions in resource-limited settings. Later in the year, we updated the consolidated *WHO guidelines for malaria* with new recommendations on vaccines, diagnostics and treatment. Further guidance across a range of technical areas is detailed in this report.

Through the E-2025 initiative, the Global Malaria Programme continues to support countries with a low malaria burden in their efforts to eliminate the last remnants of the disease. In January 2024, WHO announced the malaria-free certification of Cabo Verde, the third country in the African Region to achieve this status. WHO certified Egypt as malaria-free in October 2024, marking a significant public health achievement for Africa's third most populous country.

The Global Malaria Programme supports the work of malaria-affected countries as part of a broader partnership that includes local communities, civil society organizations, researchers, multilateral agencies and financial and technical partners, among others. We are deeply grateful for the partnerships that sustain and amplify our work. Together, we can achieve even greater success in the years ahead.

"Malaria is a preventable and fully treatable disease. With political will, sustained investment, effective partnerships, and a strategic mix of interventions, we can eliminate malaria and pave the way for healthier, thriving communities across the globe."

Dr Daniel Ngamije M.
Director, Global Malaria Programme

Acknowledgements

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Other staff members of the WHO Global Malaria Programme reviewed the technical information provided in the report, including: Amy Barrette (Technical Officer, Strategic Information for Response), Andrea Bosman (Unit Head, Diagnostics, Medicines & Resistance), Jane Cunningham (Senior Technical Officer, Diagnostics, Medicines & Resistance), Elkhan Gasimov (Unit Head, Elimination), Seth Irish (Technical Officer, Vector Control and Resistance), Arnaud Le Menach (Unit Head, Strategic Information for Response), Peter Olumese (Medical Officer, Diagnostics, Medicines & Resistance), Charlotte Rasmussen (Technical Officer, Diagnostics, Medicines & Resistance), Maru Aregawi Weldedawit (Unit Head, High Burden to High Impact) and Lindsey Wu (Technical Officer, Diagnostics, Medicines & Resistance).

In addition to the generous contributions of Member States to WHO's core funding, and to the essential technical inputs from WHO's malaria partners, the Global Malaria Programme gratefully acknowledges the financial support that sustains its ongoing operations from the Government of France, Government of Spain, Gates Foundation, Unitaid and Government of China through the United Nations Peace and Development Trust Fund.

Abbreviations

ACT	artemisinin-based combination therapy
COVID-19	coronavirus disease
G6PD	glucose-6-phosphate dehydrogenase
HBHI	High burden to high impact
IPTp-SP	intermittent preventive treatment of malaria in pregnancy with sulfadoxine-pyrimethamine
MFT	multiple first-line therapies
MPAG	Malaria Policy Advisory Group
pfhrp2	*Plasmodium falciparum* histidine-rich protein 2
PPC	preferred product characteristics
R&D	research and development
TAG-MEC	Technical Advisory Group on Malaria Elimination and Certification
VCAG	Vector Control Advisory Group
WHO	World Health Organization

This family in the United Republic of Tanzania received insecticide-treated bed nets, a widely adopted tool in Tanzanian households that provides a protective barrier against malaria-carrying mosquitoes.

Photo credit: © Abbie Trayler-Smith/ Malaria No More UK

The Global Malaria Progamme: a decade of impact

Over the past 10 years, the Global Malaria Programme has been at the forefront of efforts to combat the disease, leveraging the World Health Organization (WHO)'s extensive presence in all malaria-endemic countries worldwide. The work of WHO and its Member States is guided by the *Global technical strategy for malaria 2016–2030*, a high-level technical framework adopted by the World Health Assembly in May 2015.[1] The strategy sets four ambitious targets for 2030 benchmarked against 2015 levels:

- reducing malaria case incidence by at least 90%;
- reducing malaria mortality rates by at least 90%;
- eliminating malaria in at least 35 countries; and
- preventing the re-establishment of malaria in all malaria-free countries.

In 2021, the World Health Assembly adopted an updated version of the strategy through resolution WHA74.9 *(1)*. The revised strategy maintains the same targets and level of ambition, while reflecting lessons learned from the period 2015–2020, including lower funding levels, stagnating progress against the disease and the impact of the COVID-19 pandemic.

Despite these obstacles, the Global Malaria Programme has been a driving force behind key advances in the fight against malaria. In 2018, in response to the global stall in malaria progress, the Programme catalysed the launch of the "High burden to high impact" (HBHI) initiative – a targeted, data-driven approach to malaria control in the hardest hit countries *(2)*. HBHI marked a strategic shift in malaria control, replacing a "one-size-fits-all" approach with customized intervention strategies informed by local data and disease dynamics. Importantly, this initiative galvanized high-level political action to accelerate reductions in malaria mortality, laying the groundwork for the 2024 Malaria Ministerial Conference.

The Programme has also provided critical support to countries with a low burden of malaria. Notably, it oversees WHO's elimination certification process, working in close collaboration with an external advisory body. Between 2015 and 2024, 14 countries were certified as malaria-free by WHO, including Maldives (2015); Sri Lanka (2016); Kyrgyzstan (2016); Paraguay and Uzbekistan (2018); Algeria and Argentina (2019); China and El Salvador (2021); Azerbaijan, Belize and Tajikistan (2023); Cabo Verde and Egypt (2024).

1 The targets of this strategy are closely aligned with Target 3.3 of the Sustainable Development Goals, which calls for ending malaria and other communicable diseases by 2030.

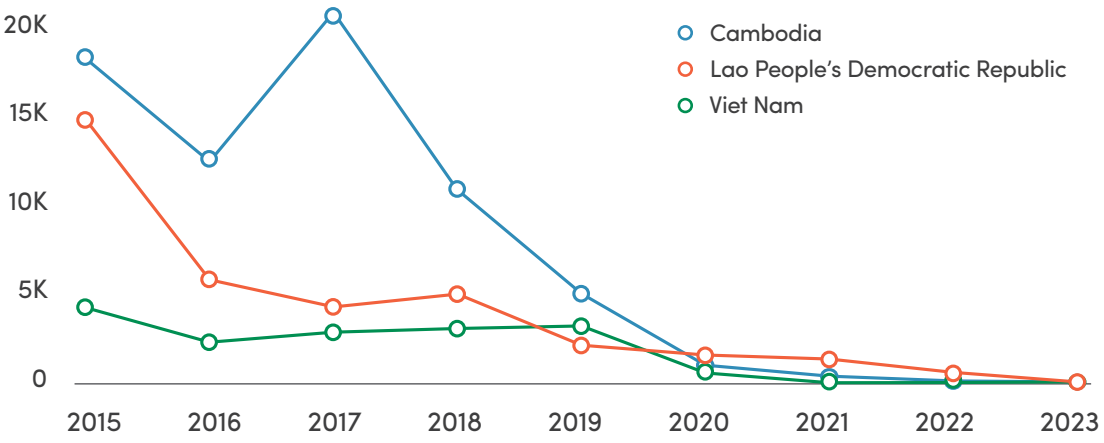
WHO played a leading role in responding to the dual challenge of malaria and COVID-19. In March 2020, as COVID-19 began to emerge in Africa, the Global Malaria Programme established a cross-partner mechanism to support malaria-endemic countries, ensuring a coordinated response to the pandemic's disruptions. Together with partners, the Programme rapidly developed technical guidance to support country-level decisions around how to safely maintain malaria services in the context of the pandemic *(3)*.

In 2021, the Global Malaria Programme played a key role in delivering the historic WHO recommendation for the widespread use of RTS,S/AS01, the first vaccine ever recommended for malaria. In 2023, WHO approved a second vaccine, R21/Matrix-M, further strengthening malaria prevention efforts. By the end of 2024, 17 African countries had introduced malaria vaccines in selected areas of moderate to high transmission. The large-scale roll-out of these vaccines is expected to save tens of thousands of young lives each year and set the stage for the next generation of malaria vaccines *(4)*.

> **"The arrival of the malaria vaccine is a monumental step in our national efforts to reduce malaria morbidity and mortality. With the support of UNICEF, Gavi, and WHO, we are on a path toward achieving our goal of a malaria-free Nigeria."**
>
> **Professor Muhammad Ali Pate**, *Coordinating Minister of Health and Social Welfare, Nigeria*

In the Greater Mekong Subregion, WHO has provided long-standing technical leadership in efforts to tackle drug-resistant malaria. Cambodia – once the epicentre of antimalarial drug resistance in the subregion – reported only 34 cases of *Plasmodium falciparum* malaria in 2023, a sharp decline from over 20 000 cases in 2017 *(5)*. Similar gains have been achieved in Lao People's Democratic Republic and Viet Nam, with both countries reporting fewer than 100 cases in 2023 (Fig. 1).

Fig. 1. Number of *P. falciparum* indigenous cases reported in Cambodia, Lao People's Democratic Republic and Viet Nam, 2015–2023

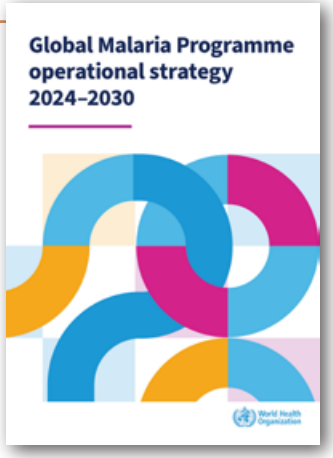


Source: World malaria report 2024 (5)

This remarkable progress reflects the leadership and commitment of countries in the Subregion, bolstered by a strong WHO partnership spanning the Global Malaria Programme in Geneva, the Mekong Malaria Elimination programme in Phnom Penh, and the WHO Regional Offices for South-East Asia and the Western Pacific.

Building on experiences in the Greater Mekong Subregion, the Global Malaria Programme led the development of the *Strategy to respond to antimalarial drug resistance in Africa (6)*, published in 2022. That same year, WHO launched an initiative to respond to the spread of *Anopheles stephensi*, an invasive mosquito vector of malaria that thrives in urban environments *(7)*. WHO also published a global framework to support city leaders and health programmes in their efforts to control malaria in a rapidly urbanizing world *(8)*.

Operational strategy 2024–2030



In April 2024, the Global Malaria Programme unveiled a new operational strategy *(9)* describing its technical direction for the period 2024–2030 and contribution to the broader WHO *Global technical strategy for malaria 2016–2030 (1)*. The strategy reflects insights gathered through an extensive consultative process, including candid and anonymous feedback from more than 50 stakeholders. It outlines four core objectives:

1. **Provide** technical leadership of the global malaria response
2. **Develop and disseminate** norms and standards
3. **Stimulate** the development and timely introduction of new tools and innovation
4. **Promote** the use of strategic information for impact

This report outlines progress in implementing the operational strategy in its first year. Although the strategy was published in April 2024, the report covers activities undertaken by the Global Malaria Programme from January to December. Delivering the full scope of activities in the operational strategy will depend on securing the necessary talent and resources. In the year ahead, the Programme aims to broaden its funding base and strategically allocate resources to high-impact priority areas.

2024 at a glance

The Global Malaria Programme achieved some notable milestones in 2024, driving progress through innovation and collaboration.

The new operational strategy, released in April, set the Programme's strategic priorities through 2030 *(9)*. From co-hosting the landmark Malaria Ministerial Conference in Cameroon to certifying Egypt as malaria-free, the year was marked by key advances in the global malaria response. Through World Malaria Day and the launch of the *World malaria report 2024 (5)*, the Programme elevated the theme of gender equality, human rights and health equity. Updated guidance offered vital resources for countries tackling evolving challenges, such as antimalarial drug resistance and *pfhrp2* gene deletions.

6 January

New WHO field guide on community-based deployment of IPTp-SP

6 March

Malaria Ministerial Conference in Cameroon and signing of Yaoundé Declaration

25 April

World Malaria Day under the theme "Accelerating the fight against malaria for a more equitable world".

12 January

WHO announces the malaria-free certification of Cabo Verde

13 February

Updated WHO guidance for controlling vector-borne diseases through indoor residual spraying

23 April

Publication of new *Global Malaria Programme operational strategy 2024–2030*

27 May

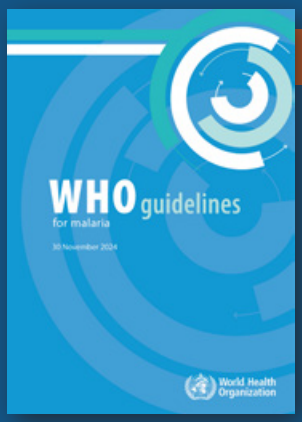
New WHO guiding principles for prioritizing malaria interventions in resource-constrained settings

31 May

Review of WHO malaria progress report by Member States at World Health Assembly

20 October

WHO announces the malaria-free certification of Egypt



30 November

Updated *WHO guidelines for malaria*

20 November

New WHO implementation guide on multiple first-line therapies as part of the response to antimalarial drug resistance

6 December

Updated WHO response plan for *pfhrp2* gene deletions

11 December

Launch of 2024 *World malaria report* with a spotlight on equity

Progress in implementing the operational strategy

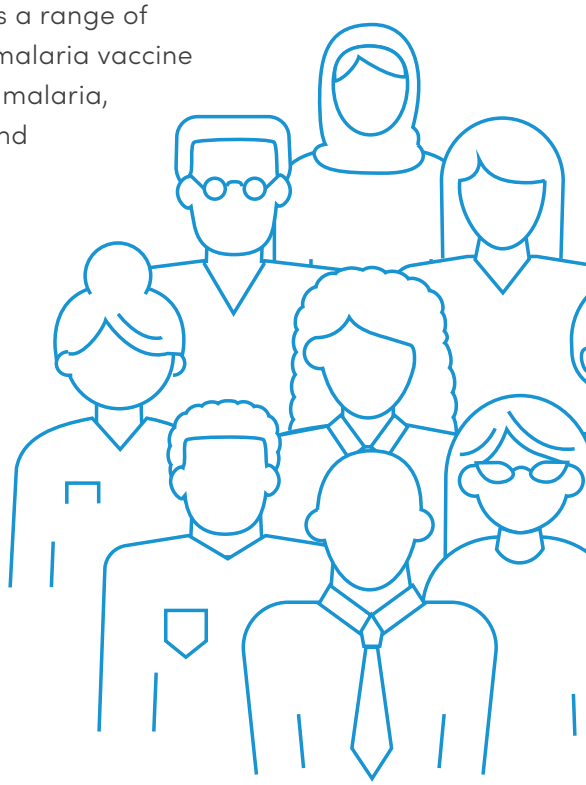
Strategic objective 1.

Driving technical leadership of the global response

WHO plays a pivotal role in shaping and advancing the global health agenda. At both country and international levels, the organization convenes key stakeholders, defines and champions priority activities, and empowers communities to access high-quality health services.

Within the malaria landscape, the Global Malaria Programme embodies this leadership role. The Programme fosters collaboration between a diverse group of stakeholders through the convening of technical meetings and high-level leadership forums. Member States benefit from the Programme's most up-to-date strategic and technical guidance on malaria control, delivered through WHO-convened expert advisory groups.

In 2024, the Global Malaria Programme convened two meetings of the Malaria Policy Advisory Group (MPAG) *(10)*, WHO's top-level advisory body for malaria. MPAG members reviewed progress and updates across a range of technical areas, such as the biological threats to vector control, malaria vaccine introduction and scale-up, new treatment guidelines for *P. vivax* malaria, emerging challenges related to zoonotic malaria transmission and subnational tailoring of malaria interventions.



The Programme also convenes meetings of the Technical Advisory Group on Malaria Elimination and Certification (TAG-MEC) *(11)*, an independent body that rigorously evaluates applications from countries seeking malaria-free certification. In September 2024, the TAG-MEC recommended the malaria-free certification of Egypt, a decision later endorsed by the WHO Director-General, leading to an official malaria-free certification. TAG-MEC members also provide guidance to WHO on policy recommendations related to malaria elimination and prevention of re-establishment of transmission.

The WHO Vector Control Advisory Group (VCAG) *(12)* – jointly managed by the Global Malaria Programme, the Global Neglected Tropical Diseases Programme and the Prequalification Team – provides an independent assessment of novel vector control tools, technologies and approaches. VCAG meetings held in 2024 featured discussions on cutting-edge tools in the pipeline for malaria vector control, such as spatial repellents, lethal house lures (eave tubes), targeted mosquito baits and genetically modified mosquitoes.

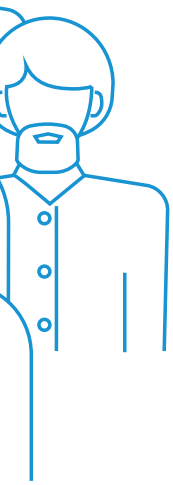
In recent years, the Global Malaria Programme has also established external groups of experts that provide scientific advice to WHO on the technical content, organization, presentation and dissemination of malaria guidelines. These Guideline Development Groups have focused on a range of technical areas – from vector control and chemoprevention to treatment protocols and elimination strategies.

In early 2024, the Programme held two Guideline Development Group meetings to assess how near-patient tests for glucose-6-phosphate dehydrogenase (G6PD) deficiency can support the safe and effective treatment of *P. vivax* malaria relapse. Experts reviewed the accuracy of G6PD point-of-care tests, contextual factors such as feasibility and acceptability, the potential impact on treatment outcomes, and cost-effectiveness. Based on these discussions, WHO issued strong recommendations in November 2024 for the use of such tests to guide treatment with primaquine and tafenoquine.

In December 2024, a separate Guideline Development Group reviewed evidence on spatial repellents, a new vector control intervention designed to complement the protection provided by insecticide-treated nets. The group also considered evidence on insecticides for indoor residual spraying (a primary vector control tool) and other proposed updates to the guidelines.

Beyond convening technical advisory groups and delivering evidence-based recommendations, the Programme advances the global malaria agenda through key advocacy platforms such as World Malaria Day, the World Health Assembly and malaria-free certification announcements.

In 2024, the Programme also played a pivotal role in shaping the global malaria response by co-hosting the Malaria Ministerial Conference in Yaoundé and contributing critical insights to the development of the "Big Push", a multi-stakeholder effort aimed at reinvigorating global malaria control. Through these and other activities, the Programme's work connects with broader global health priorities, such as primary health care, that are essential for getting progress back on track.



Malaria Ministerial Conference

Meeting the ambitious targets of the WHO *Global technical strategy for malaria 2016–2030 (1)* will require stepped-up resources and decisive action in high-burden African countries. In March 2024, WHO and the Government of Cameroon co-hosted the Malaria Ministerial Conference in Yaoundé, convening more than 400 stakeholders, including Ministers of Health and senior representatives from high-burden African countries, global health leaders, scientists, parliamentarians, civil society and other partners *(13)*. The meeting sought to reshape the trajectory of global malaria trends by leveraging political commitment, multisectoral action, community engagement, research and innovation.

> **"I would like to call for greater synergy between all players – including the private sector, decentralized local authorities and various civil society organizations – to take action to reduce malaria in our society."**
>
> **H. E. Dr Joseph Dion Ngute,**
> *Prime Minister, Cameroon*

The key outcome of the conference was the signing of the "Declaration for accelerated malaria mortality reduction in Africa" *(14)* by the Ministers of Health of 11 countries that bear two thirds of the global malaria burden (Fig. 2, Table 1). The declaration reaffirms the principle that "no one should die from malaria given the tools and systems available" and outlines seven key actions:

1. **Strengthening** political will to prioritize malaria control and elimination
2. **Using** data strategically to guide action and maximize impact
3. **Enhancing** technical guidance to ensure effective, data-driven interventions
4. **Improving** coordination and fostering multisectoral collaboration
5. **Strengthening** national health systems to deliver integrated care
6. **Building** partnerships for sustainable funding, research and innovation
7. **Establishing** accountability mechanisms to track progress

To date, three countries (Cameroon, Nigeria and Uganda) have developed performance frameworks for the adopted actions, including indicators and processes for monitoring specific outcomes. Civil society and parliamentarians from African countries will play a critical role in driving investment in malaria and holding those in office accountable.

The Yaoundé conference showcased the transformative power of multisectoral partnerships. Its success was built on the collective efforts of a wide range of stakeholders, with vital support from the WHO Regional Office for Africa, the WHO Country Office in Cameroon, civil society organizations, and a diverse group of malaria experts and thought leaders. Crucial funding was provided by the Government of France, Gates Foundation, RBM Partnership to End Malaria, Gavi, the Vaccine Alliance, Unitaid and African Leaders Malaria Alliance.

Fig. 2. Countries participating in the "High burden to high impact" approach

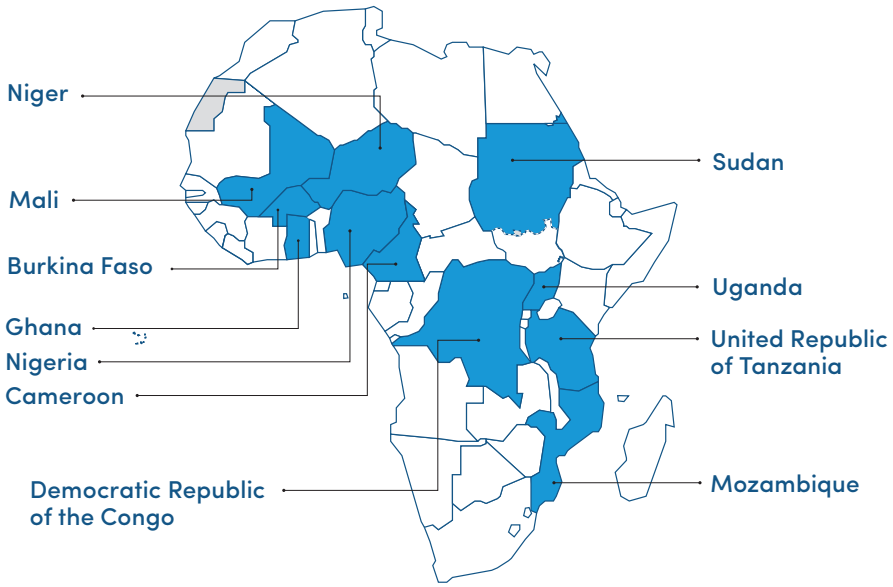


Table 1. Estimated cases and deaths in high burden countries, 2023

Countries	Estimated cases	Estimated deaths
Burkina Faso	8 139 355	16 146
Cameroon	7 343 057	11 602
Democratic Republic of the Congo	33 140 568	67 464
Ghana	6 551 533	11 464
Mali	8 229 337	14 203
Mozambique	9 256 415	17 875
Niger	7 982 517	35 381
Nigeria	68 136 454	184 689
Sudan	3 406 261	7 974
Uganda	12 572 519	15 945
United Republic of Tanzania	8 554 792	25 540
Total	**173 312 808**	**408 283**

Source: World malaria report 2024 (5)

From left, the Ministers or Health of Mali, Nigeria, Cameroon, Burkina Faso and Uganda signing the Yaoundé Declaration. Photo credit: ©WHO/Otto Bakano

"Big Push"

Global malaria partners recognize the need to complement the powerful pledges from African Ministers of Health captured in the Yaoundé Declaration. Amid a slowdown in malaria progress and resource constraints, coordinated action among stakeholders and greater alignment has never been more critical.

The "Big Push" framework aims to better align support from global malaria partners with the specific needs of affected countries. It highlights the importance of engaging communities, civil society and the private sector, alongside the imperative to bolster primary health care. The RBM Partnership to End Malaria has been entrusted as the custodian of the "Big Push" initiative, which is set to launch in 2025.

Priority actions include the following:

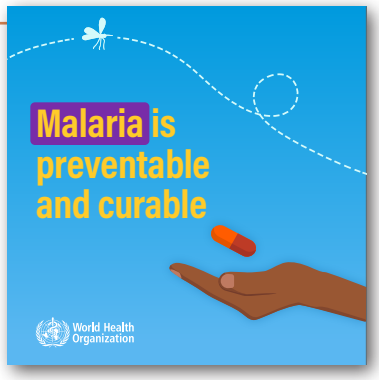
1. **Improve** coordination among global, regional and country partners
2. **Uphold** national leadership and accountability while advancing an inclusive, whole-of-society approach
3. **Strengthen** data systems and enable data-driven decision-making
4. **Increase** the accessibility, acceptability and quality of existing interventions
5. **Develop** and prepare for the rapid introduction of new, transformational tools
6. **Increase** funding for malaria, building on a new narrative

In 2024, the work of the Global Malaria Programme helped to advance, in particular, progress towards the third and fifth priority actions:

- **Data-driven decision-making.** In May 2024, the Global Malaria Programme published a set of guiding principles to support countries in selecting the most effective mix of interventions in resource-constrained settings *(15)*.
- **Rapid introduction of new tools.** In 2024, WHO streamlined its processes for guideline development and the prequalification of new health products.

World Malaria Day 2024

World Malaria Day, marked annually on 25 April, is a critical global platform for advocacy and leadership. Each year, the Global Malaria Programme works closely with advocacy networks, civil society organizations and other partners to draw international attention to the disease's devastating health, social and economic impacts. The day also serves as a rallying point to secure renewed political commitment from governments and highlight the importance of sustained investment in malaria programmes.



The 2024 theme, "Accelerating the fight against malaria for a more equitable world", emphasized the urgency of addressing inequities in access to malaria prevention, treatment and care, as well as the underlying root causes that heighten vulnerability to the disease among specific populations *(16)*. The Global Malaria Programme led efforts to define and shape this theme, securing support from the RBM Partnership to End Malaria and other advocacy partners. The theme was further amplified through a special equity-focused chapter in the 2024 edition of the *World malaria report (5)*.

Advancing equity: harnessing primary health care to reduce malaria's burden on the most vulnerable

Malaria is a disease that disproportionately affects the world's poorest regions, with infants and young children suffering the greatest mortality. Socioeconomic inequalities in the malaria burden call for targeted responses that address disparities related to poverty and other forms of social disadvantage.

In 2024, the Global Malaria Programme turned a spotlight on the opportunity of primary health care to tackle inequalities and improve access to malaria services for those most vulnerable to the disease. In messaging amplified around World Malaria Day and the *World malaria report 2024 (5)*, WHO called on countries and their development partners to commit to primary health care as the foundation of strong, equitable and efficient health systems. Messaging focused on the need to:

- identify and address multiple and intersecting forms of discrimination;
- tackle the underlying determinants of health;
- ensure timely access to appropriate malaria interventions and health care services; and
- enable the active participation of communities in all health-related decision-making at the local, national and international levels.

Through these and other platforms, the Programme also called attention to the critical need for robust investments in data systems to monitor and address health inequities. Despite advances in understanding malaria's risks and impacts, significant gaps persist in the availability of comprehensive, disaggregated data and information to identify those left behind and the barriers they face. Closing these gaps can equitably reduce the burden of malaria on the most vulnerable.

Lylah with her daughter Zinny at a health facility in Lilongwe, Malawi, where Zinny received her third dose of the malaria vaccine.

Credit: © WHO/Fanjan Combrink

World Health Assembly

At the Seventy-seventh World Health Assembly, held in Geneva, Switzerland, from 27 May to 1 June 2024, Member States reviewed a WHO progress report *(17)* on the *Global technical strategy for malaria 2016–2030* and its targets. The report outlines recent trends, key challenges and ongoing efforts to strengthen malaria control, as well as opportunities to accelerate progress. Key opportunities cited in the report include:

- implementing the key actions outlined in the Yaoundé Declaration;
- using data strategically to optimize the impact of malaria interventions in resource-constrained settings;
- expanding the roll-out of WHO-recommended malaria vaccines;
- developing and deploying next-generation tools, such as new vector control technologies, diagnostics and medicines; and
- strengthening country-level adoption of WHO guidance.

Prepared by the Global Malaria Programme, the report garnered robust engagement at the Assembly, with more than 50 interventions by WHO Member States.

Regional perspectives on malaria: challenges and calls to action

Speaking at the World Health Assembly on behalf of Member States of the WHO African Region, which carries about 95% of the global malaria burden, the representative from Namibia welcomed the roll-out of malaria vaccines and expressed appreciation for the support provided by WHO and partners to African countries. He noted, however, that fragile health systems continue to hamper malaria responses in many countries, alongside other challenges such as biological threats, insufficient funding and climate change. In response, he called for stronger political commitment and sustainable resource mobilization.

On behalf of the Eastern Mediterranean Region, the representative of the Islamic Republic of Iran highlighted progress towards malaria elimination, particularly in Egypt and Saudi Arabia. However, he noted the surge in cases, largely due to catastrophic flooding in Pakistan and the humanitarian crisis in Sudan. Recognizing the rising costs of malaria control and the growing burden of other vector-borne diseases, he called for urgent and sustained investment in malaria response efforts.

The representative of Sri Lanka, who spoke on behalf of the WHO South-East Asia Region, reaffirmed the Region's commitment to achieving the goals set out in WHO's global malaria strategy *(1)*. He noted the importance of cross-border collaboration in preventing malaria transmission and highlighted the need to address the social determinants of the disease to protect vulnerable populations.

Malaria-free certifications

WHO malaria-free certification serves as a critical platform for advocacy in the global malaria response. Certifications showcase that elimination is achievable, inspiring action and setting a benchmark of success for other countries to intensify their efforts. They also validate investments in malaria control and elimination programmes, delivering measurable outcomes that build confidence among donors and policy-makers.

Only WHO has the mandate to certify a country as malaria-free. The certification is granted when a country can prove, beyond a reasonable doubt, that the chain of indigenous malaria transmission has been interrupted nationwide for at least three consecutive years. A country must also demonstrate the capacity to prevent the re-establishment of transmission.

In October 2024, Egypt was officially certified as malaria-free, marking the culmination of a nearly 100-year effort by the government and its people to eliminate a disease that had been present since ancient times. Egypt is the third country in the WHO Eastern Mediterranean Region to achieve this milestone, following the United Arab Emirates and Morocco.

The WHO press release announcing Egypt's malaria-free certification called attention to key factors behind this success, such as the provision of free diagnosis and treatment to the entire population, regardless of legal status, and nationwide training programmes for health professionals to enhance malaria case detection *(18)*. WHO also highlighted Egypt's strong cross-border partnerships, notably with neighbouring Sudan, which play an important role in preventing the re-establishment of local malaria transmission.

In January 2024, the WHO Director-General, Dr Tedros Adhanom Ghebreyesus, travelled to Cabo Verde to celebrate the country's malaria-free certification.[1] Cabo Verde is the third country in the WHO African Region to be awarded malaria-free status, following Mauritius (1973) and Algeria (2019).

> **"Malaria is as old as Egyptian civilization itself, but the disease that plagued pharaohs now belongs to its history and not its future. This certification of Egypt as malaria-free is truly historic, and a testament to the commitment of the people and government of Egypt to rid themselves of this ancient scourge."**
>
> **Dr Tedros Adhanom Ghebreyesus**,
> *WHO Director-General*

1 The WHO Director-General officially signed the certificate in December 2023 and travelled in January 2024 to congratulate the country on its malaria-free status.

Speaking alongside the Prime Minister of Cabo Verde at an award ceremony in the capital city of Praia, Dr Tedros commended the Government and its people for their "unwavering commitment and resilience". He noted that the country's malaria-free status is a testament to the power of strategic public health planning, collaboration, and sustained effort to protect and promote health *(19)*.

> **"The certification as a malaria-free country has a huge impact, and it's taken a long time to get to this point. In terms of the country's external image, this is very good, both for tourism and for everyone else. The challenge that Cabo Verde has overcome in the health system is being recognized."**
>
> **Ulisses Correia e Silva,**
> *Cabo Verde's Prime Minister*

From left, Minister of Health of Cabo Verde Filomena Mendes Gonçalves, Prime Minister of Cabo Verde H.E. Ulisses Correia e Silva and WHO Director-General Dr Tedros Adhanom Ghebreyesus, at a ceremony on 12 January 2024 to recognize the country's malaria-free status.

Photo credit: ©WHO/JacsSpoor

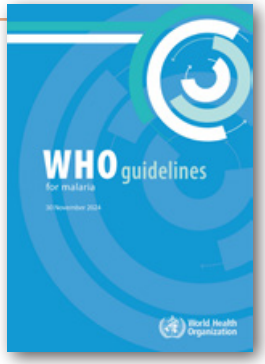
Strategic objective 2.

Setting and disseminating norms and standards

WHO's evidence-based technical recommendations are a cornerstone of the global response to malaria. Normative guidance supports the translation of evidence into action by aligning countries and partners under one common technical vision and strategic direction.

In recent years, the Global Malaria Programme has enhanced access to WHO's global guidance, with a view to optimizing its use at the country level. Notably, the Programme has made a consolidated set of malaria guidelines available on a web-based platform in four languages (English, French, Spanish, Arabic). These "living guidelines" are continuously updated to reflect new or updated recommendations *(20)*.

WHO guidelines for malaria

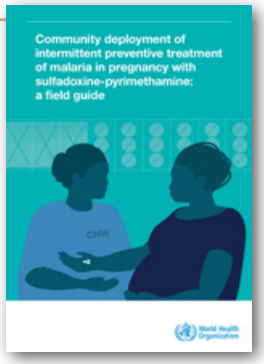


The latest version of the *WHO guidelines for malaria (21)*, published on 30 November 2024, includes an updated recommendation on malaria vaccines; new recommendations on the use of near-patient G6PD tests to guide the treatment of *P. vivax* and *P. ovale* infections; and updated treatment recommendations on the use of primaquine and tafenoquine.

In 2024, WHO published a set of guiding principles to support country-level decisions in resource-limited settings around the selection of high-impact malaria interventions – in particular, early diagnosis and treatment, insecticide-treated nets, indoor residual spraying, malaria vaccines and chemoprevention *(15)*.

WHO also published critical guidance across a range of other technical areas. This guidance is described below and in subsequent sections.

New WHO field guide aims to boost malaria prevention for pregnant women



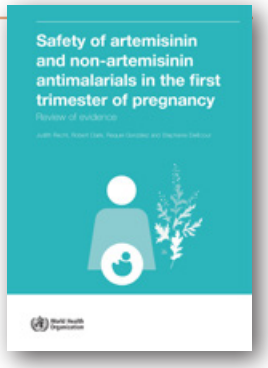
Malaria poses significant risks for pregnant women and girls, particularly those living in poor, rural areas of Africa. Pregnancy reduces a woman's immunity to malaria, making her more susceptible to anaemia and, in some high-risk areas, severe illness and death. Malaria infection in pregnancy also carries substantial risks for the fetus and newborn child, including low birthweight, a major risk factor for newborn deaths.

To protect pregnant women from malaria, WHO recommends a three-pronged approach: sleeping under an insecticide-treated net, receiving intermittent preventive treatment with sulfadoxine-pyrimethamine (IPTp-SP) after the first

trimester, and receiving prompt treatment with an effective antimalarial medicine following a confirmed diagnosis. In 2023, less than half (44%) of eligible pregnant women received the recommended number of IPTp-SP doses.

To help address this coverage gap, the Global Malaria Programme published a new field guide in January 2024 aimed at increasing IPTp-SP coverage through a community-based delivery model *(22)*. Under this approach, trained community health workers deliver the preventive therapy directly to pregnant women in villages or other local settings, complementing the services provided at antenatal care clinics. This approach has been shown to boost access to IPTp-SP and ensure that more pregnant women are protected from malaria.

WHO evidence review confirms artemether-lumefantrine as a safe and effective treatment for malaria in pregnancy



Pregnant women diagnosed with malaria require immediate treatment with a safe and effective antimalarial medicine. Since 2022, WHO has recommended artemether-lumefantrine, a widely used artemisinin-based combination therapy (ACT), as the first-line treatment for uncomplicated *P. falciparum* malaria in all populations, including pregnant women in their first, second and third trimesters. ACTs were previously not recommended during the first trimester due to concerns over their potential effects on the developing fetus.

In April 2024, WHO published a comprehensive review of the latest available evidence on the effects and safety of all antimalarial medicines in pregnancy, including data from animal toxicity studies *(23)*. The findings confirmed that artemether-lumefantrine is both a safe and effective treatment in the first trimester of pregnancy. Wider access to artemether-lumefantrine will ensure improved outcomes for pregnant women affected by malaria.

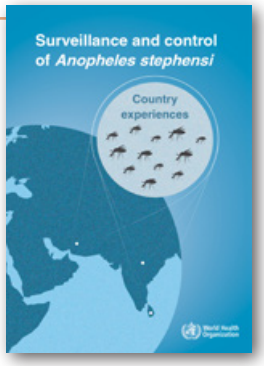
Updated WHO guidance on controlling vector-borne diseases through indoor residual spraying

To prevent malaria, WHO recommends two primary vector control interventions for large-scale use: insecticide-treated nets and indoor residual spraying. For indoor residual spraying, insecticides are sprayed inside homes and other buildings where disease-transmitting insects are likely to rest. While indoor residual spraying has been widely used to kill malaria-carrying *Anopheles* mosquitoes, it can also kill insects that transmit other deadly and debilitating diseases, such as dengue, Chikungunya, yellow fever, Zika virus disease, leishmaniases and Chagas disease, highlighting the importance of integrated disease control.

In February 2024, the Global Malaria Programme published an updated operational manual on indoor residual spraying, broadening the manual's scope to include not

only malaria but also other vector-borne diseases *(24)*. This updated guidance is aligned with the *Global vector control response 2017–2030 (25)*, a WHO strategy aimed at strengthening vector control worldwide through integrated action across sectors and diseases, among other measures.

Country experiences highlight the need for integrated vector control



In recent years, *An. stephensi* has emerged as a significant challenge for malaria control on the African continent, with detection of the invasive mosquito species reported in eight countries since 2012. Unlike other malaria vectors, *An. stephensi* thrives in urban environments and is resistant to many of the insecticides used in public health.

To address this growing threat, the Global Malaria Programme spearheaded an initiative in 2022 aimed at stopping the spread of *An. stephensi* on the African continent *(7)*. It calls, among other measures, for *An. stephensi* control measures to be integrated into broader vector-borne disease management programmes.

As part of a wider effort to document and share best practices, the Programme published a report in July 2024 summarizing lessons learned from three countries that have been working to control *An. stephensi* over many decades: India, the Islamic Republic of Iran and Sri Lanka *(26)*. A key takeaway is the need for stronger integration between malaria responses and vector control programmes.

Sri Lanka's Vavuniya district provides a good example of locally integrated programming. While there are certain inefficiencies related to siloed approaches between dengue and malaria programmes at the national level, such as separate reporting forms, dengue and malaria surveillance and control activities are integrated at the district level. Larval control of both *Aedes* and *Anopheles* mosquitoes, particularly where they occur in the same types of larval sites, results in greater overall prevention of mosquito-borne diseases.

Leveraging online learning platforms to combat malaria

The Global Malaria Programme continues to expand its efforts to provide accessible, high-quality training through online learning platforms. In December 2024, in collaboration with the WHO Academy, the Programme launched "Malaria: harnessing the power of routine facility data" *(27)*, a self-paced training course designed to equip health professionals with the skills to analyse and interpret routine malaria surveillance data. The overall aim of the course is to drive evidence-based decision-making at the health facility and subnational levels. The course contains five structured modules, of which Module 1 is available on the WHO Academy platform and Modules 2–5 will be published in 2025.

In June 2022, the Programme released a 13-module "Malaria elimination" curriculum on the OpenWHO platform, providing participants with the knowledge and skills to plan, implement, monitor and evaluate programmes for both eliminating malaria and preventing its re-establishment. By the end of 2024, more than 23 000 people had enrolled in the course, available in four languages (English, Arabic, French and Spanish). In December 2024, the course transitioned to the WHO Academy platform, with an update planned for 2025 *(28)*.

Nan Laodi, from Myanmar, and Huang Pei Pei, a Chinese student, use bed nets every night in their dorm room at the Friendship Primary School in Daluo, in China's Yunnan Province, a few hundred metres from the Myanmar border.

Credit: © WHO/Christine McNab

Strategic objective 3.

Stimulating the development and timely introduction of new tools and interventions

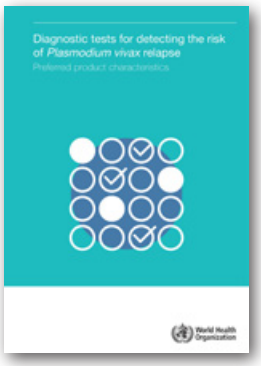
While scaling up existing tools can drive faster progress in the global malaria response, new innovations will be essential to tackle emerging threats and achieve the ambitious targets of the global strategy. There are many novel interventions under development or evaluation, including innovations in vector control tools, vaccines, diagnostics and medicines.

The Global Malaria Programme works closely with the WHO Prequalification Department to ensure that new health products meet rigorous standards for quality, safety and efficacy, with prequalification aligned to WHO recommendations. In 2024, WHO streamlined its guideline development and prequalification processes to accelerate the introduction of new tools. As of January 2025, these processes run in parallel rather than sequentially, allowing for the more rapid deployment of vital health innovations.

As part of WHO's efforts to streamline product assessment and recommendation development, the Global Malaria Programme also took a decision in December 2024 to cease its requirement of comparative efficacy data for second-in-class vector control products *(29)*.

Shaping future research and development priorities

The Global Malaria Programme also plays a critical role in shaping the research agenda and setting future research and development (R&D) priorities. Key to this effort is the development of preferred product characteristics (PPCs), which define the desired characteristics of products to meet specific health goals. PPCs guide researchers, manufacturers and policy-makers in creating products that are impactful, scalable and aligned with public health needs.



In 2022, WHO published PPCs outlining strategic goals for new malaria vaccine development, including preferred performance and operational characteristics *(30)*. These PPCs emphasize the need for higher efficacy, long-duration vaccines capable of transforming malaria responses, with a view to achieving both malaria elimination and eradication. Over the past two years, WHO staff have presented these PPCs to the malaria community at conferences and scientific advisory meetings, while vaccine researchers have provided regular R&D updates to ensure alignment with WHO guidance. The Global Malaria Programme aims to update these PPCs over the next biennium to guide the development of improved malaria vaccines.

About one third of the global population is at risk of contracting *P. vivax* malaria, and malaria relapses caused by *P. vivax* parasites pose a significant challenge to global elimination efforts.

In April 2024, the Programme released two PPCs for diagnostic tests designed to detect the risk of *P. vivax* relapse *(31)*:

- The first PPC outlines requirements for point-of-care tests to identify individuals at risk of relapse, enabling timely and appropriate treatment.
- The second focuses on laboratory-based tests for screening individuals or communities, aiding *P. vivax* surveillance and monitoring efforts.

Other priority areas for PPCs include genetically modified mosquitoes, as well as products such as non-invasive diagnostic tests and monoclonal antibodies.

Malaria parasites: key species and global impact

There are five *Plasmodium* parasite species that cause malaria in humans, and two of these species – *P. falciparum* and *P. vivax* – pose the greatest threat. *P. falciparum* is the deadliest malaria parasite and the most prevalent on the African continent. *P. vivax* is the dominant malaria parasite in most countries outside of sub-Saharan Africa. The other malaria species that can infect humans are *P. malariae*, *P. ovale* and *P. knowlesi (32)*.

Tracking and guiding malaria vaccine development

WHO monitors the R&D pipeline through a publicly available online dashboard, updated jointly by the Global Malaria Programme and the WHO Department for Immunization, Vaccines and Biologicals *(33)*. At the end of 2024, there were 38 vaccine candidates in active clinical development.

The two malaria vaccines currently recommended by WHO – RTS,S/AS01 and R21/Matrix-M – target infants and young children. Some vaccines in the pipeline aim to protect additional high-risk populations, such as older children and adults, including women of childbearing age. Other innovations are designed to improve efficacy and duration of protection against malaria.

WHO-convened technical consultations provide guidance on key challenges for malaria vaccine R&D. In June 2024, WHO convened experts to review the current landscape of research on immune correlates of protection for malaria *(34)*. These biological markers, such as antibodies or immune cells, can provide early indication of a vaccine's protective efficacy and help to accelerate clinical development.

Monoclonal antibodies: a new frontier in malaria prevention

There have also been notable R&D advances in the development of monoclonal antibodies for malaria prevention. These special proteins, made in laboratories to mimic the antibodies produced naturally by the human immune system, are designed to stop malaria parasites from either damaging human cells or multiplying in the body. In 2023, the Global Malaria Programme published PPCs to guide R&D in this critical area *(35)*. The PPCs will be updated over the next biennium.

Malaria diagnostics: adapting to new challenges

Malaria symptoms, such as fever, headache and chills, often overlap with those of other diseases. Timely and accurate diagnosis, followed by prompt treatment for confirmed malaria cases, is essential to prevent severe disease and death.

Rapid diagnostic tests are an essential tool for detecting malaria. The most widely used tests target HRP2, a protein produced by the *P. falciparum* malaria parasite. However, in recent years, genetic mutations in some parasites have prevented the production of this protein, complicating diagnosis and endangering the lives of malaria patients.

According to the *World malaria report 2024 (5)*, malaria parasites with these genetic mutations have been detected in 41 countries worldwide. The latest data are available in the WHO Malaria Threats Map *(36)*, a web-based platform that tracks key biological threats to malaria control worldwide.

The Global Malaria Programme has led efforts to respond to the threat of *P. falciparum* histidine-rich protein 2 (*pfhrp2*) gene deletions since 2017, issuing critical guidance for countries on the implications for case management, as well as procedures for investigating suspected false-negative rapid diagnostic test results. WHO recommends that countries transition away from HRP2-based tests when the prevalence of false-negative results caused by gene deletions exceeds 5%.

Response plan to *pfhrp2* gene deletions

To mitigate this threat, the Programme released a global response plan in 2019. A second edition of the *Response plan to pfhrp2 gene deletions (37)*, published in December 2024, calls for multifaceted action that includes, among other measures, facilitating the development of a new generation of point-of-care tests. The plan is supported by two updated surveillance protocols for detecting *pfhrp2* gene deletions, also released in December 2024 *(38, 39)*.

Researchers are actively developing diagnostic tools that detect alternative markers of malaria, either alone or in combination with HRP2. Some of these tests have received approval from the Expert Review Panel for Diagnostics, a mechanism

overseen by the Global Fund to review the risks and benefits of diagnostic tools that have not yet been prequalified by WHO. These and other tests are currently in the WHO prequalification pipeline to ensure they meet global health standards.

Non-invasive tests that use saliva or urine are also being explored, offering the potential for rapid diagnosis outside of traditional medical settings. Taken together, these efforts aim to ensure that malaria detection stays ahead of evolving challenges.

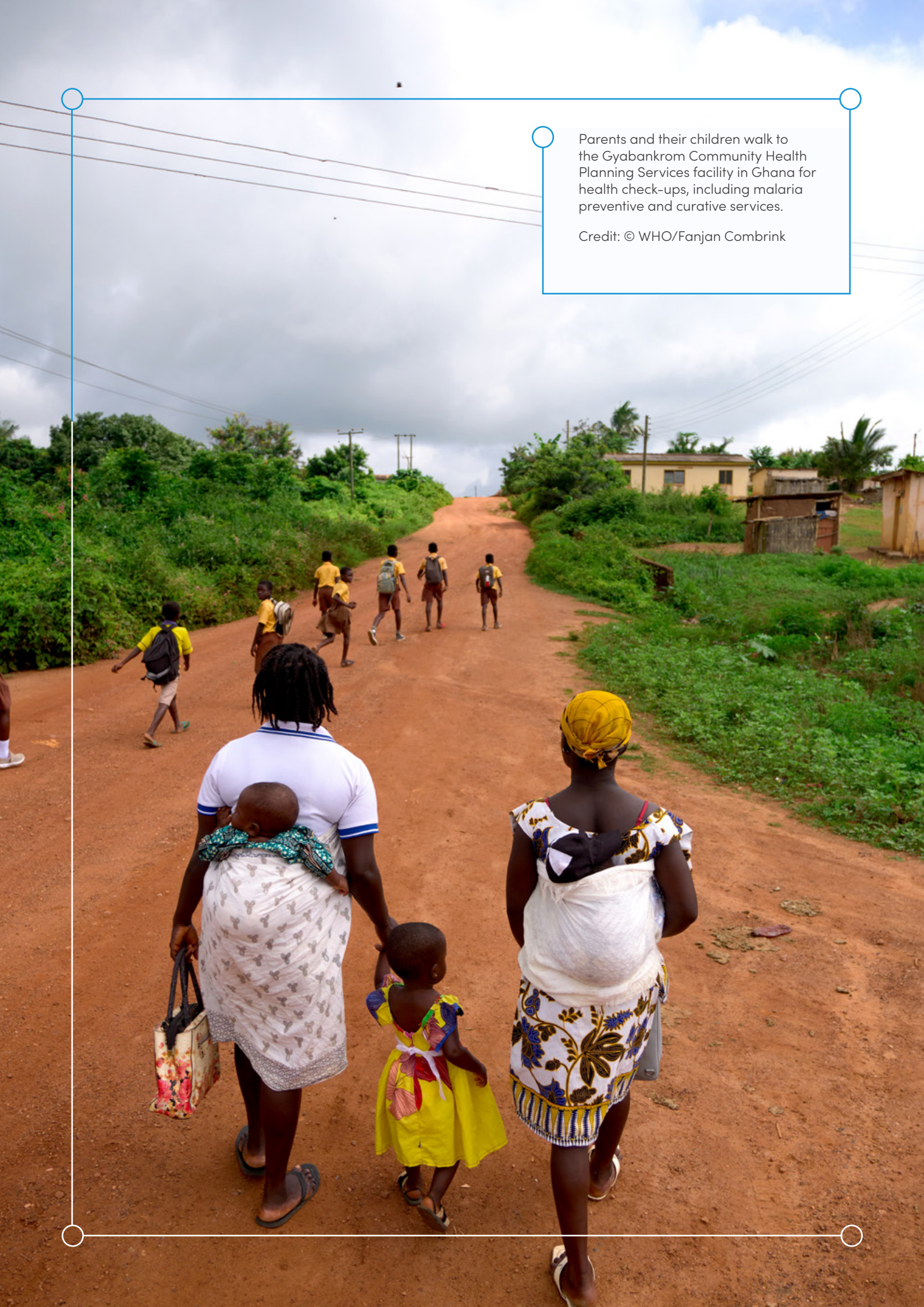
Multiple first-line therapy: an innovative approach to counter antimalarial drug resistance

WHO's 2022 *Strategy to respond to antimalarial drug resistance in Africa (6)* calls for innovative approaches to delay the spread of drug-resistant malaria using currently available drugs. One such approach is to extend the lifespan of ACT treatment regimens using multiple first-line therapy (MFT).

MFT involves the use of two or more effective ACTs to treat uncomplicated malaria, either concurrently or in rotation. A new implementation guide from the Global Malaria Programme, released in November 2024, provides guidance for malaria programmes on assessing MFT's impact on resistance and considerations for policy and implementation *(40)*.

According to the guide, successful implementation of MFT requires careful consideration of factors such as drug efficacy and rotation schedules, distribution of medicines across geographical areas and health systems, and current levels of antimalarial resistance. It further highlights the need for timely policy changes, as delays in action can lead to increased treatment failure rates and undermine efforts to combat resistance.

In collaboration with WHO colleagues in the African and Eastern Mediterranean Regions, the Global Malaria Programme is supporting Ministries of Health in endemic countries to facilitate a smooth transition to MFT through the revision of treatment guidelines, the inclusion of WHO-recommended ACTs in national essential medicines lists, and the development of strategies for allocating medicines among population groups and geographies.



Parents and their children walk to the Gyabankrom Community Health Planning Services facility in Ghana for health check-ups, including malaria preventive and curative services.

Credit: © WHO/Fanjan Combrink

Strategic objective 4.

Leveraging strategic information for impact

The *World malaria report* is WHO's flagship publication on malaria, providing an annual, in-depth analysis of data and trends across the globe. It also serves as a single, consolidated update on programmatic progress, threats to malaria control and dynamics in the financing landscape. The report's key data and findings guide strategic decision-making and investments by stakeholders at all levels – from in-country actors to international donors and other partners.

The World malaria report 2024

The 2024 edition of the report spotlights both encouraging trends and persistent challenges in global malaria control *(5)*. It calls on political leaders to turn their stated commitments into concrete measures that will save lives, while also underscoring the need for coordinated support from global development partners.

Building on the year's World Malaria Day theme, the *World malaria report 2024* featured a special equity-focused chapter, developed together with the WHO Programme for Gender Equality, Human Rights and Health Equity as well as a range of external partners and researchers. The chapter explores the complex interplay of factors (social, economic, environmental and systemic) that heighten vulnerability to malaria and limit access to preventive and treatment services for specific populations, such as those living in poverty, children and pregnant women, displaced and marginalized populations, and other hard-to-reach communities.

To amplify the report's findings, the Global Malaria Programme organized a series of advance stakeholder briefings and prepared a comprehensive information package featuring key messaging, graphs, an interview with the lead author, and tailored social media materials. A global press conference, held in collaboration with the RBM Partnership to End Malaria and experts from three WHO technical departments, showcased expertise in malaria, equity and vaccines. The report garnered extensive media coverage in leading outlets, such as *Agence France Presse*, *Reuters, The Guardian* and *TV5 Monde*. It was also widely disseminated across major social media platforms, where it generated a significant level of engagement.

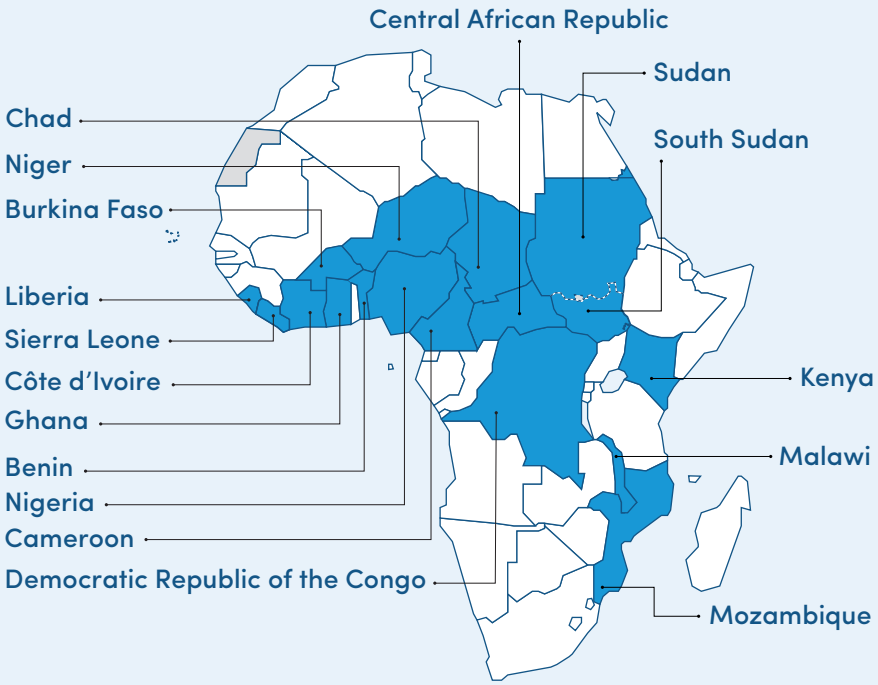
The *World malaria report* is one of the Programme's most visible achievements each year and is a powerful vehicle to shape the global malaria narrative. It is made possible through close collaboration with WHO staff across the three levels of the organization and national malaria programmes, as well as a range of external technical and academic partners. The report's data inform research activities, resource allocation and policy decisions by multiple partners, including academic groups, nongovernmental organizations, donors and United Nations agencies.

Key data and findings from the 2024 malaria report

According to the latest report, more than 177 million malaria cases and 1 million deaths were averted worldwide in 2023. Of the remaining 83 malaria-endemic countries, 25 reported fewer than 10 cases of malaria, and many more are progressing towards elimination. Some higher burden countries, including India, Liberia and Rwanda, are also making strong inroads against malaria, achieving large reductions in cases in recent years.

By the end of 2024, 17 African countries had introduced WHO-approved malaria vaccines (Fig. 3). Nearly 80% of insecticide-treated nets deployed in the African Region were new-generation nets that provide better protection against malaria than standard pyrethroid-only nets. An estimated 53 million children were reached with seasonal malaria chemoprevention in 2023, compared to just 170 000 in 2012.

Fig. 3. African countries that had introduced a WHO-recommended malaria vaccine subnationally as of December 2024



Malaria vaccines save lives: proven impact in 3 African countries

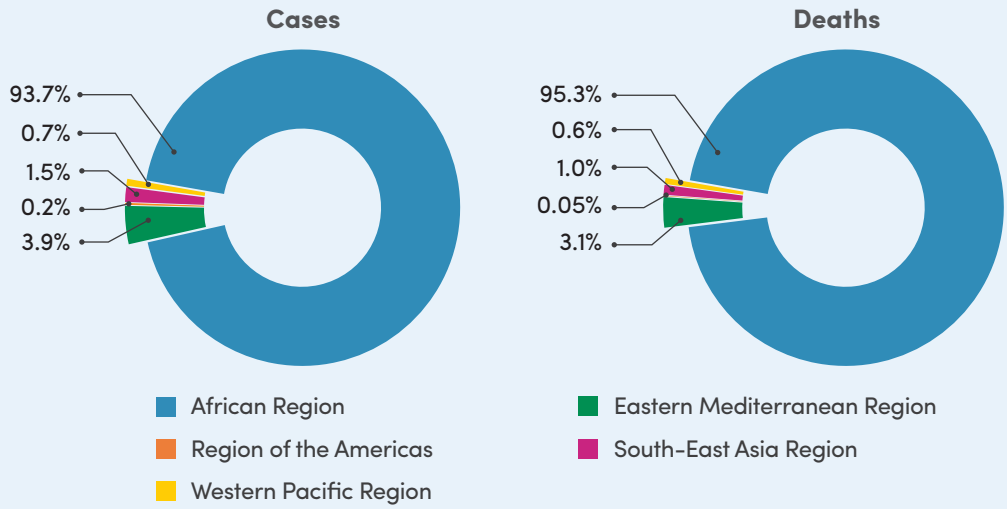
From 2019–2023, more than 2 million children in Ghana, Kenya and Malawi received the RTS,S/AS01 malaria vaccine through the WHO-coordinated Malaria Vaccine Implementation Programme. An independent evaluation demonstrated high public health impact *(4)*:

- 13% reduction in early childhood deaths
- 22% reduction in hospitalizations for severe malaria

Malaria, however, remains a formidable public health challenge. According to the report, the global tally of malaria deaths reached 597 000 in 2023, compared to 578 000 in 2015. That same year saw an estimated 263 million new cases of malaria – an increase of 37 million cases compared to 2015.

The African Region remains hardest hit by the disease, shouldering about 94% of cases and 95% of deaths globally (Fig. 4). Two thirds of the global malaria burden is concentrated in 11 African countries.

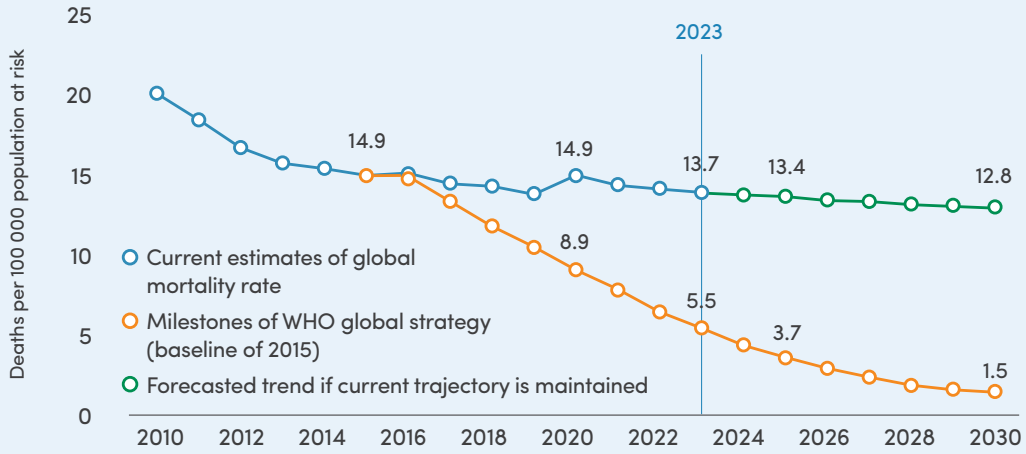
Fig. 4. Distribution of cases and deaths by WHO Region, 2023



Source: World malaria report 2024 (5)

In view of current trends, progress towards critical targets of the WHO global malaria strategy *(1)* remains substantially off course. The 2023 global malaria case incidence rate of 60.4 cases per 1000 at risk was three times higher than the target of 21.3 cases. Meanwhile, the 2023 mortality rate of 13.7 deaths per 100 000 at risk was more than double the target of 5.5 deaths (Fig.5).

Fig. 5. Comparison of global progress in malaria mortality considering two scenarios: current trajectory maintained and targets of the WHO global strategy achieved



Source: World malaria report 2024 (5)

Tracking the spread of biological threats to malaria control

The Global Malaria Programme monitors and publishes the latest data on key biological threats through the Malaria Threats Map *(36)*. This web-based tool provides a comprehensive and real-time overview of four challenges that could undermine malaria control and elimination efforts:

- vector insecticide resistance
- invasive vector species
- *pfhrp2/3* gene deletions
- antimalarial drug efficacy and resistance

The Malaria Threats Map integrates data from multiple sources, including national malaria programmes, research institutions and WHO partners. It offers critical insights to guide targeted interventions, resource allocation and strategic planning.

Following the revamping of this tool's architecture in 2022 and 2023, efforts in 2024 focused on ensuring that all datasets and maps were up to date. A notable milestone was the establishment of a data-sharing agreement between the Global Malaria Programme and Oxford University in June 2024, facilitating the exchange of data on molecular markers of antimalarial drug resistance in the Greater Mekong Subregion; the data have since been integrated into the map.

All datasets are housed securely in WHO's xMart data warehouse, which supports a streamlined process for updates while maintaining data integrity, completeness and accuracy. Software developers provided critical maintenance support for the application throughout the year.

The Malaria Threats Map is a vital resource for endemic countries and the international health community, providing a centralized hub for the latest data on key biological threats. Data displayed on the map have informed the development of key WHO strategies, such as the recently published *Response plan to pfhrp2 gene deletions (36)*, as well as strategies to respond to antimalarial drug resistance *(6)* and *An. stephensi (7)* in Africa. In addition, the map supports strategic investments in surveillance and malaria control by key funding partners.

Bridging malaria control and climate action

Malaria and other vector-borne diseases are climate-sensitive. Changes in temperature, humidity and rainfall can alter transmission by affecting the lifecycle of the mosquito and parasite. Climate-related extreme events such as cyclones, heavy rains and flooding disrupt infrastructure, limit access to health care, heighten food insecurity and malnutrition, and complicate the delivery of malaria interventions.

Pakistan's catastrophic 2022 flooding offers a striking example, with malaria cases surging eight-fold – from just over 500 000 in 2021 to nearly 4.3 million in 2023 *(5)*. Such events, driven by rising temperatures and changing weather patterns,

are expected to increase in frequency and severity, posing a particular threat to vulnerable populations.

The *World malaria report 2023 (41)* brought critical attention to the intersection between malaria and climate change, a theme further elevated through a WHO-led side-event at the United Nations Climate Change Conference (COP28). Messaging focused on the importance of integrating malaria control strategies within the broader climate and health agenda.

Building on this work, the WHO Global Malaria Programme co-authored a major scoping review flagging the urgent need for robust research and evidence on the impacts of climate change on malaria and 20 neglected tropical diseases *(42)*. Published in May 2024, the review of more than 42 000 articles was conducted through the WHO Task Team on Climate Change, Neglected Tropical Diseases and Malaria, in partnership with Reaching the Last Mile.

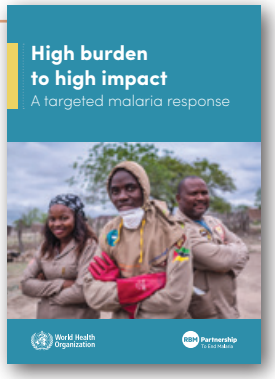
A forthcoming WHO policy brief will address the evidence gap and provide actionable guidance for national policy-makers, development partners, advocacy organizations and civil society to address the intertwined challenges of climate change, malaria and neglected tropical diseases. Developed through an inclusive and participatory process, it aims to ensure broad stakeholder alignment and support for its recommendations.

Muhammad Qasim Khan of WHO Pakistan investigates breeding sites for *Anopheles* mosquitoes in Balochistan, Pakistan.

Credit: © WHO/Panos Pictures/Saiyna Bashir

Context-based country support

Advancing malaria control in "High burden to high impact" African countries



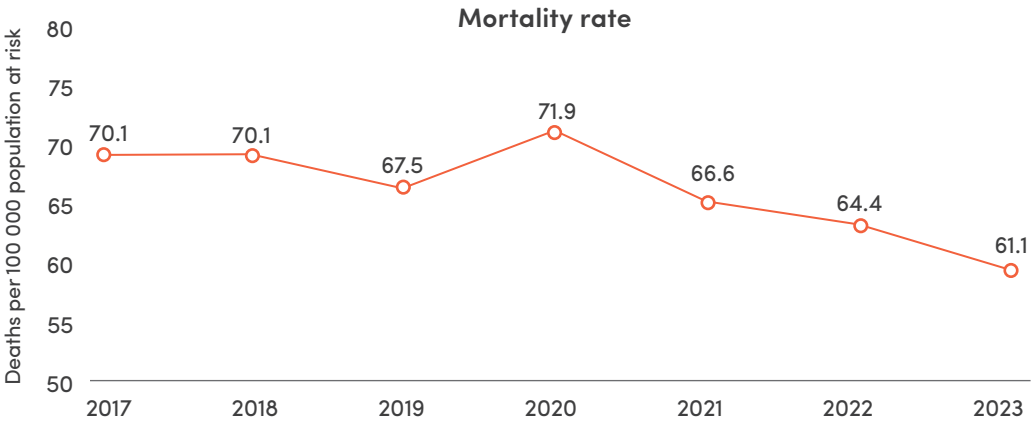
In 2023, approximately two thirds of global malaria cases and deaths were concentrated in 11 African countries: Burkina Faso, Cameroon, Democratic Republic of the Congo, Ghana, Mali, Mozambique, Niger, Nigeria, Sudan, United Republic of Tanzania and Uganda. These countries have adopted the "High burden to high impact" (HBHI) approach, a targeted effort to deliver tailored intervention packages to populations at greatest risk of malaria *(2)*.

Launched in 2018 by WHO and the RBM Partnership to End Malaria, the HBHI approach aims to accelerate reductions in malaria burden in the hardest hit African countries through four pillars: political will to reduce malaria deaths; strategic information to drive impact; better guidance, policies and strategies; and coordinated national malaria responses. HBHI is built on a platform of strong health systems and multisectoral responses.

Between 2017 and 2023, the mortality rate (deaths per 100 000 population at risk) in the 11 HBHI countries fell by an estimated 13% (Fig. 6), while case incidence (cases per 1000 population at risk) stabilized over the same period *(5)*. In 2024, Ministers of Health from the 11 HBHI countries in Africa signed the Yaoundé Declaration, pledging to further accelerate reductions in malaria mortality *(14)*.

An evaluation across 10 HBHI countries provided valuable insights into achievements, challenges and opportunities for improvement. Key findings were presented to members of the Malaria Policy Advisory Group in March 2024 and have since been used to refine HBHI tools and strategies.

Fig. 6. Malaria mortality rate in HBHI countries, 2017–2023



Source: World malaria report 2024 (5)

The evaluation highlighted progress in several high-burden countries, particularly in securing greater political commitment and mobilizing stakeholder engagement. The HBHI approach has fostered a broader recognition of the importance of data-driven decision-making and the need for subnationally tailored interventions.

However, the evaluation identified key challenges such as:

- **Limited cross-sectoral engagement.** Malaria control is still largely perceived as the sole responsibility of the health sector, hindering the coordinated actions needed for an effective response.
- **Constraints in data utilization.** Inadequate resources and technical capacity continue to limit the ability of national malaria programmes to translate strategic information into action.
- **Disruptions due to guidance gaps and staff turnover.** Access to up-to-date technical guidance is limited, and personnel turnover among health providers has disrupted its effective implementation.

These findings underscore the need for clear performance metrics, stronger multisectoral collaboration, more strategic resource allocation, targeted interventions based on the local context and sustained political engagement to enhance the impact of HBHI efforts.

The principles of HBHI are applicable to many malaria-endemic countries. To build on the progress achieved and extend the reach of HBHI, the approach will be expanded to additional countries in 2025, starting with Angola and Côte d'Ivoire. Preparations for this expansion are under way, including meetings with senior authorities to secure strong political commitment and ensure effective implementation.

In 2024, WHO partnered with Ghana's National Malaria Control Programme and a local academic institution on a pilot project to map malaria mortality. The project sought to understand key drivers of malaria-related deaths and develop strategies to mitigate them. A similar activity is under way in Uganda, spearheaded by the Ministry of Health. The methodology used in the project will inform the creation of standard operating procedures for malaria mortality mapping across all HBHI countries, in line with the Yaoundé Declaration's goal of ending malaria mortality.

In 2023, the 11 HBHI countries accounted for nearly one quarter (24%) of internally displaced persons and refugees globally *(5)*. Nine of the 11 HBHI countries have some form of civil unrest within their respective borders. In 2024, the Global Malaria Programme updated its handbook on malaria control in humanitarian emergencies, originally published in 2013 *(43)*. The updated manual, to be released in 2025, was developed in collaboration with multiple partners engaged in emergency humanitarian responses such as UNICEF, UNHCR, the UN Refugee Agency, Médecins Sans Frontières and the MENTOR Initiative, among others. It will serve as an essential resource for managing malaria in emergency contexts.

Arlo Cansino, Programme Coordinator at Belize Vector Control and Ecology Center, collects larvae as part of routine entomological surveillance. This work is critical for understanding the behaviour, population dynamics, and distribution of malaria vectors and ensuring effective control measures.

Credit: © Estefania Bravo/UN Foundation

Driving progress in malaria-eliminating countries under the WHO E-2025 initiative

Through the E-2025 initiative, the Global Malaria Programme has been supporting 25 countries and one territory with low malaria burdens as they work towards the goal of elimination. Since the launch of this initiative, Belize and Cabo Verde have been certified as malaria-free by WHO. In addition, Suriname and Timor-Leste have formally applied for WHO malaria-free certification after achieving three consecutive years of zero indigenous cases; both will undergo certification assessment in 2025. Several other E-2025 countries have made notable progress:

- Saudi Arabia recorded three consecutive years of zero indigenous malaria cases (2021–2023).
- Bhutan achieved two consecutive years of zero indigenous cases (2022–2023).
- Dominican Republic reduced its malaria caseload by about 80%, from 1291 cases in 2019 to 253 in 2023.
- Ecuador cut malaria cases by more than 65%, from 1803 in 2019 to 604 in 2023.
- Mexico and Nepal also saw substantial declines, reporting only 42 and 15 cases, respectively, in 2023.

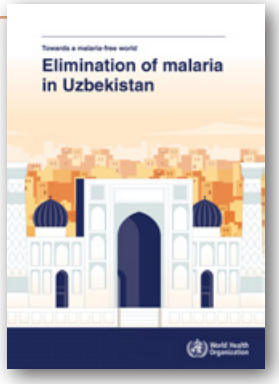
However, progress has been uneven. Some E-2025 countries, notably Comoros, the Islamic Republic of Iran and Panama, have experienced a resurgence of malaria, underscoring the need for sustained and enhanced elimination efforts.

Achieving and sustaining malaria elimination: guidance for a malaria-free future

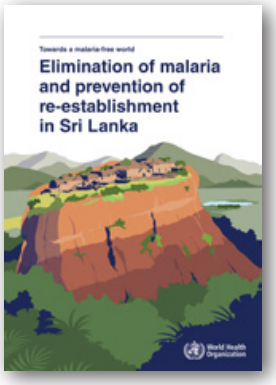
Beyond malaria-free certification, the Global Malaria Programme provides essential technical guidance and support to countries that are working towards the elimination goal. This includes, for example, assisting in the development of robust malaria elimination strategies and advising on measures to manage and mitigate the risk of re-establishment. The Programme also publishes global guidance and facilitates the exchange of best practices and lessons learned, fostering collaboration to achieve and maintain certification goals.

In 2024, the Programme initiated an update of its framework for malaria elimination *(43)*, drawing on country experiences and lessons learned since 2017. WHO is also developing guidance for malaria-endemic and malaria-free countries on the prevention of re-establishment of malaria transmission. These documents have been reviewed by members of WHO advisory bodies and will be published in 2025.

Documenting lessons in resilience: how Sri Lanka and Uzbekistan eliminated malaria



After a period of success in interrupting malaria transmission, Uzbekistan experienced a resurgence of the disease in the 1990s and early 2000s. A report published in January 2024 by the Global Malaria Programme assessed the strategies undertaken by Uzbekistan to contain these outbreaks and, ultimately, achieve the goal of zero indigenous malaria cases *(45)*. Uzbekistan was certified as malaria-free by WHO in 2018.



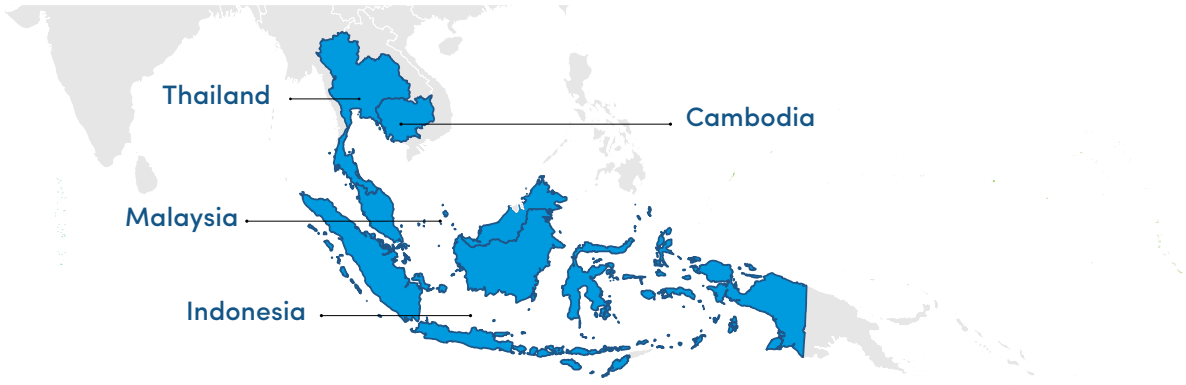
After nearly eliminating malaria in the early 1960s, Sri Lanka experienced a resurgence of the disease that persisted for five decades. In April 2024, the Global Malaria Programme published a report describing the strategy Sri Lanka used to eliminate the disease nationwide, as well as the policies implemented to prevent its re-establishment *(46)*. Sri Lanka was certified as malaria-free by WHO in 2016.

Key factors behind Sri Lanka's success in eliminating malaria were steady political and financial support, robust technical strategies and guidance, and effective collaboration with critical stakeholder groups such as the armed forces, United Nations agencies, nongovernmental organizations and civil society groups.

Addressing the emergence of zoonotic malaria in South-East Asia

P. knowlesi is a zoonotic parasite transmitted from macaques (monkeys) to humans by *Anopheles* mosquitoes. Known for its severe and rapid onset, global *P. knowlesi* cases rose by nearly 19% between 2022 and 2023, from 2768 to 3290 *(5)*. The majority of cases were concentrated in Malaysia (87%), followed by Thailand (7.8%), Indonesia (4.4%) and Cambodia (0.3%) (Fig. 7).

Fig. 7. Countries reporting the highest numbers of *P. knowlesi* malaria cases, 2023



The emergence of *P. knowlesi* poses challenges for WHO's malaria elimination certification process, which currently considers only the four primary human malaria species (*P. falciparum, P. vivax, P. ovale* and *P. malariae*). Recognizing the complexity of zoonotic malaria in South-East Asia, WHO convened a technical consultation in November 2024 to assess the current situation and challenges in affected countries.

There are no proven interventions for diagnosing or controlling zoonotic malaria, nor guidelines for response strategies. Surveillance gaps – particularly in terms of understanding the density, distribution and prevalence of *P. knowlesi* among non-human primate reservoirs and vectors – further hinder response efforts. Environmental degradation and deforestation, known drivers of *P. knowlesi*, as well as changing levels of human malaria immunity in the region may also influence zoonotic malaria dynamics.

Addressing *P. knowlesi* transmission requires a multisectoral approach involving health, forestry and agriculture, alongside strong community engagement. Research priorities identified during the consultation include developing species-specific diagnostics, improving surveillance of non-human primate and vector populations, and designing targeted interventions for macaques and vectors. Importantly, discussions emphasized the need for WHO to explore alternative certification pathways for malaria elimination in countries where zoonotic malaria persists despite the elimination of human malaria parasite species.

Uniting for impact: a multi-disease strategy to achieve WHO's elimination goals

As of 2024, WHO is targeting the elimination or eradication of 32 diseases or conditions. A multi-disease elimination approach can achieve these ambitious goals more efficiently, effectively and equitably by:

- aligning with the primary health care approach and leveraging common platforms within health systems, across sectors and in communities to address multiple diseases targeted for elimination, concurrently and in areas where the need is greatest; and
- balancing the priorities of single disease and multiple disease strategies throughout the various phases of disease elimination, while tailoring actions to the specific context of each country.

Conclusion

The Global Malaria Programme plays a vital role in supporting WHO Member States in their malaria response efforts. In close collaboration with WHO colleagues, malaria-affected countries and a wide network of partners, the Programme delivered some notable successes in 2024, advancing the objectives of its new operational strategy and the broader WHO *Global technical strategy for malaria 2016–2030*.

Over the past two years, the Programme has introduced new approaches to programme management to ensure the delivery of high-quality technical products and the timely completion of deliverables. These and other shifts, described in the operational strategy, have strengthened its ability to prioritize resources, manage risks and uphold accountability to WHO leadership, Member States, technical partners and funders.

Looking ahead: priorities for 2025

In 2025, the Programme will continue to provide technical leadership in the global malaria response, mobilizing stakeholders to drive whole-of-government action, secure the necessary investments and accelerate progress while containing critical threats.

Building on the landmark signing of the Yaoundé Declaration, the Programme will further advocate for increased political commitment and resources to bolster malaria responses in high burden countries. At the same time, it will continue to support countries with a low burden of malaria in their efforts to stamp out the disease.

The Programme will continue to publish important guidance across a range of technical areas, informed by the best available scientific evidence. New guidance expected in 2025 includes:

- an operational manual on larval source management;
- an updated malaria vaccine introduction guide;
- a revised manual on malaria surveillance, monitoring and evaluation;
- a reference manual on tailoring malaria interventions and strategies at the subnational level;
- an updated manual on malaria control in humanitarian emergencies;
- an updated framework for malaria elimination; and
- global guidance on preventing the re-establishment of malaria transmission.

In addition, the Programme will refine its 2024 *Guiding principles for prioritizing malaria interventions in resource-constrained country contexts*, incorporating insights from a multi-model comparison of intervention strategies across different transmission contexts.

Committed to scientific rigour and innovation, the Programme and its independent advisory bodies will continue to drive the development and evaluation of the cutting-edge technologies needed to combat malaria and to manage pressing threats, such as insecticide and drug resistance. In 2025, this will include, for example, reviewing evidence on spatial repellents (a novel vector control intervention) and providing expert advice on the identification of new molecular markers for antimalarial drug resistance.

The Programme will remain agile in addressing emerging priorities and optimizing available resources. It will continuously assess progress, integrate lessons learned and, where necessary, refine its approaches, ensuring that each deliverable translates into real-world impact at the country level.

With sustained investment and collaboration, the Global Malaria Programme remains committed to driving progress towards a malaria-free world and building a healthier future for all.

A woman walks with her child in the village of Kingombe, near Kalemie, Democratic Republic of the Congo.

Credit: © WHO/Griff Tapper

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