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Background documentation for Day 1

This file contains the slides that were shown by the presenters during Day 1 of the meeting as well the background documentation shared with MPAG members ahead of the meeting.

Tuesday, 14 October 2025			
	Session 1	**Open**	
13:00 – 13:10	Welcome by the Chairperson, MPAG	Professor Dyann Wirth MPAG Chairperson	**for information**
13:10 – 13:15	Opening remarks	Dr Jeremy Farrar Assistant Director-General, Health Promotion, Disease Prevention & Control	
13:15 – 13:45	Report from the Director Presentation	Dr Daniel Ngamije M. Director a.i., Malaria & Neglected Tropical Diseases department	
	Session 2	**Open**	
13:45 – 14:15	Updates on epidemics and emergency responses Background | Presentation Updates and progress on Yaoundé Declaration	MPAG Sub-Committee HBI Dr Nnenna Ogbulafor, Director National Coordinator, Nigeria Dr Maru Aregawi Weldedawit	**for information**
	Session 3	**Open**	
14:15 – 15:00	Subnational tailoring of malaria interventions and strategies manual *(critical follow up & dissemination gaps/ needs for country uptake)* Manual | Presentation	Dr Arnaud Le Menach	**for advice**
	Session 4	**Open**	
15:30 – 16:00	Update on guidelines development (ITNs, vaccines, IPTp for HIV+ pregnant women and SLD primaquine, non-falciparum diagnostics) Background | Presentation	Dr Andrea Bosman	**for information & advice**

Report from the WHO
Malaria and Neglected Tropical Diseases department

Malaria Policy Advisory Group 28th meeting
Geneva, Switzerland - virtual

14-16 October 2025

Dr Daniel Ngamije, Director a.i.,

Malaria and Neglected Tropical Diseases

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Overview

1. Global financial disruptions
2. Global health governance
3. Technical updates
   - Vector control
   - Vaccines
   - DMR
   - HBHI
   - Elimination
   - Strategic information for impact
4. Follow up from April MPAG meeting

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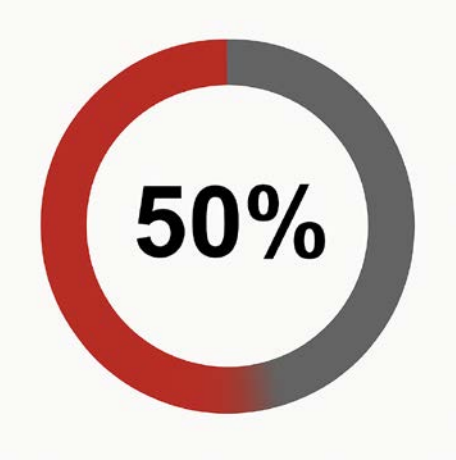
1. Global Financial Disruptions

Global context : Inadequately funded health systems/Malaria response

- Global malaria financing meets **only 50% of required resources** to reach GTS 2030 targets.
- **Africa paid USD 85 billion in 2023** to service debt, limiting budget space for health.
- **Illicit financial transfers cost Africa USD 88 billion per year**, draining domestic revenues.
- **Official Development Assistance (ODA)** is projected to be **40% lower than two years ago**.
- **Weak public financial systems** leave **13% of health budgets unspent**.
- Governments face **increasing competition for resources** from other national priorities.



Global malaria financing gaps only 50% of required resources are available

Country examples of the response:

- **Nigeria** increased 2025 health budget by **200M USD**
- **Ghana** increased funding for National Health Insurance Scheme, resulting in an increase of **Ghs 3.5 billion**
- **Burkina Faso, Côte d'Ivoire and Togo** are **co-financing** their malaria vaccines
- **Cameroon** funded **Seasonal Malaria Chemoprevention (SMC)**
- Some Countries are using **SNT to improve the allocation of limited funding**

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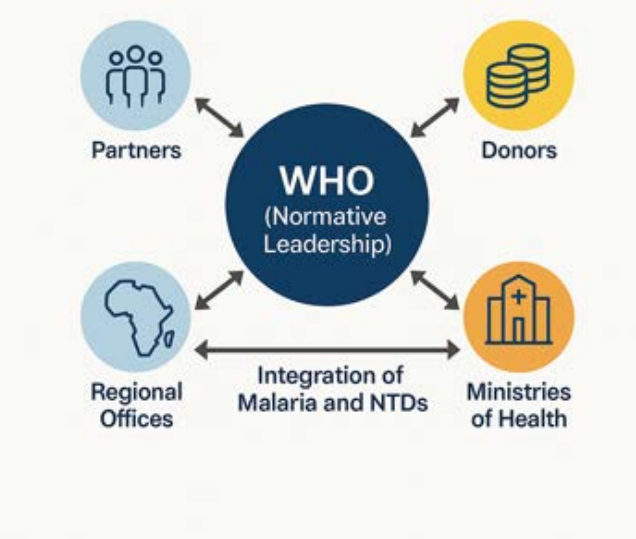
Sources:
- Data from the United Nations Conference on Trade and Development (UNCTAD) shows that Africa loses USD 88 billion annually from IFFs
- Debt: African Frum and network on debt and development (AFRODAD) Statement on the African Debt Monitoring Mechanism, Johannesburg, SOUTH AFRICA, 03rd October 2025
- Expected reduction in ODA by 40% reduction: The P4H Network for social health protection and health financing Blog (April 2025)
- Countries underspend their health budgets by 13%: Budget Execution in Health: From Bottlenecks to Solutions (September 4, 2025) World Bank

2. Global Health Governance and Health Systems Integration

Key Points: Global advocacy is needed !

- **Health systems integration** more broadly supports **stronger primary health care**, shared infrastructure and coordinated community engagement.
- **Integrated approaches** between malaria and NTDs enhance **efficiency, cost-effectiveness and sustainability** across many areas including **vector control, surveillance and service delivery.**
- WHO's merged **Malaria and Neglected Tropical Diseases** department **enables cross-cutting support**, **aligned normative guidance**, leveraging platforms for data and capacity building.
- Many **Ministries of health** already **integrate malaria and NTD programmes**. Further benefits could result from **embedding inter-sectors and into sector planning**, budgeting, prioritization and service delivery.
- **Greater partner alignment** behind national strategic plans and priorities **will improve the efficient use of resources**.



WHO commitment:

WHO's transformation reinforces its capacity **to coordinate, guide, and assure quality interventions** across the malaria response, ensuring that **country priorities and scientific integrity** remain at the core of global health governance.

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3. Technical updates

a. Vector control and insecticide resistance
b. Vaccines
c. Diagnostics, medicines & resistance
d. High burden to high impact
e. Elimination
f. Strategic information for response

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3a. Vector Control and insecticide resistance

Progress since April 2025

Updates to consolidated malaria guidelines on 13 Sept 2025:

- **Two new insecticide classes** – chlorfenapyr (pyrroles) and isocycloseram (isoxazolines) – were recommended for IRS
- **A conditional recommendation**, with moderate quality evidence, was also issued for use of spatial emanators, to supplement existing core interventions.

Discriminating concentrations (DCs) of broflanilide and isocycloseram:

- DCs were determined for 4 mosquito species (Anopheles gambiae s.s., An. funestus, An. stephensi and Aedes aegypti)
- This will inform the revision of the manual for monitoring insecticide resistance.

Publication of the LSM operational manual:

- The document integrates control of malaria and arbovirus vectors, and enhanced use of technology,
- The manual will be published in Q4 2025

Refinement of WHO support to VC tools developpers:

- Vector Control Advisory Group (VCAG) was dissolved, with all future meetings cancelled.
- The process to trigger the development of recommendations will be made internally and in line with existing WHO procedures **(ref next slide)**

Upcoming priorities

Normative guidance:

- The Norms , Standards and Processes (NSP) document underpinning the development of WHO recommendations on vector control : **revised document will be published in Q4 2025**

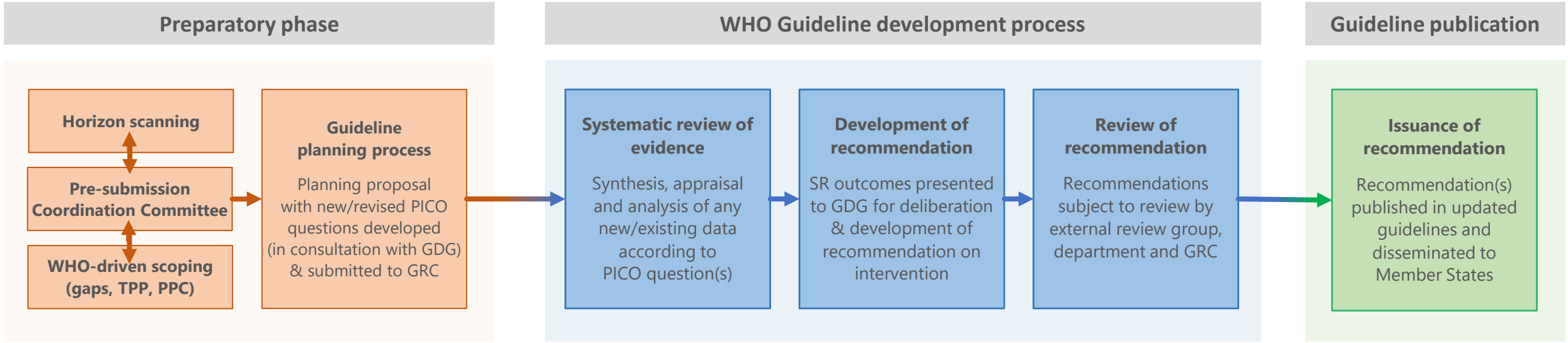
Evidence synthesis & Guidelines Development:

- **GDG April 2026** to consider updates to the guidelines for malaria, focused on consolidated ITN recommendations, endectocides and eaves tubes.

Monitoring, management of threats & strengthening vector control:

- Update to the Global plan for insecticide resistance monitoring and management **(Q4 2026)**
- Finalizing the Strategy to eliminate Anopheles stephensi in Africa. **(Q2 2026)**
- Initiate the update of the Handbook on Integrated Vector Management **(Q1 2026**)

3a. Post VCAG Vector control guidelines development process



3b. Vaccines

Progress since April 2025

Malaria vaccine roll-out

- **5 additional countries - Uganda, Mali, Guinea, Togo, Ethiopia – supported to introduce malaria vaccine (23 total introduced)** and **5 additional countries to scale-up***
  - >10 million children in cumulative **annual target** population, rapidly increasing
  - First country (Mali) implementing 5-dose schedule via **hybrid delivery approach**
- **Successful integration of SMC , the vaccine status screening and referral of children for vaccination services**, including in Benin, Burkina Faso, Guinea, Mali, Niger, Nigeria, Uganda, and Togo
- Continued coordination of partners and sharing of lessons through **Malaria Vaccine Coordination Team (MVCT)** and WHO Regional Office for Africa's **AMVIRA**

Evidence review: Assessment of 3-dose versus 4-dose malaria vaccine schedule

- **RTS,S/AS01 case-control study** in Ghana, Kenya, and Malawi completed:
  - Among children who received 4 vaccine doses, Vaccine efficacy against hospitalized severe malaria was 54%; the **4th dose provided 30% incremental effectiveness against severe malaria** above that provided by 3 doses
  - No evidence of **rebound among children** who missed the fourth dose.
- Joint session of SAGE-MPAG reaffirmed **their recommendation for the use of the four doses as the recommended schedule**.

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* Scale-up: Uganda (combined with introduction), Democratic Republic of the Congo, Côte d'Ivoire, South Sudan, Burkina Faso, Liberia

Upcoming priorities

Malaria vaccine roll-out

- Support **3 additional countries** to introduce malaria vaccine, including second country (Guinea-Bissau) using hybrid approach for higher impact
- Support transition t**o new Gavi support modalitie**s in the next strategic period (2026-2030)

Evidence synthesis, Learning, and Research

- Finalize the publication of the final MVIP results (46 months evaluation) and the MVIP Collection/Supplement
- Support documentation and dissemination of lessons on vaccine implementation, **including integrated service delivery**

Next generation vaccine R&D

- Technical consultations on 1) **multi-stage/combination vaccines** and 2) harmonised analytical approaches to **validate immune correlates of protection**
- Develop **shared reference standards for assays** used in vaccine R&D

3c. Diagnostics, Medicines & Resistance

Progress since April 2025

- **Established new malaria diagnostitcs Guideline Development Group (GDG)** to develop recommendations on diagnosis of *P. knowlesi* , *P.malariae* and *P.ovale* using RDTs .
  - Planning proposal submitted and approved by the GRC **(July 2025)**
  - Agreed on PICO/PIRT questions
  - Identified systematic review group – University of Heidelberg

- **Continued Guidelines Development Goup on malaria chemotherapy**
  - Planning proposal submitted and approved by the GRC **(June 2025)**
  - **Systematic reviews completed on:**
    - Intermittent preventive treatment regimens for malaria in HIV positive pregnant women
    - Efficacy and safety of single low dose primaquine to interrupt *P. falciparum* malaria transmission in paediatric patients compared to adults: a WWARN systematic review and individual patient data meta-analysis
    - Regulatory approval documentation on “Coartem® baby”

- **Malaria Multi-Model Comparison of Priority Interventions**
  - 2nd Technical Consultation to review progress **(June 2025)**
  - 2nd meeting of IVIR-AC to review methods and results presentation **(Sept 2025)**

Upcoming priorities

- **Guidelines**
  - Completion of systematic reviews on malaria diagnostics
  - Convening the **GDG** on malaria chemotherapy **(Nov 2025**) and diagnostics (March 2026)
  - Development recommendations, submission to GRC and publication of guidelines updates (July 2026)
  - In collaboration with Science for Health Department development workplan and grant proposal for living guidelines

- **Malaria Multi-Model Comparison of Priority Interventions (M3CPI)**
  - 3rd Technical Consultations to present and review results of modelling work (Mid December)
  - Presentation of findings to MPAG and SAGE for advice on use of M3CPI results to update WHO Guiding principles for prioritizing malaria interventions in resource-constrained country contexts to achieve maximum impact

3d. High burden to high impact (HBHI) & malaria in emergencies

Progress since April 2025

Support implementation of the Yaoundé Declaration

- Standardized accountability framework developed
- Three countries (Cameroon, Nigeria, Uganda) conducted national dialogue (performance frameworks
- Engagement of African civil society and parliamentarians to enhance accountability

Developing strategies for accelerated mortality reduction

- Concept note for mapping malaria deaths and specific determinants was developed
- Piloting in Ghana and Uganda
- Progress is slow due to unavailability of resources to facilitate the process in all HBHI countries (both in WHO and RBM)

Finalized and printed Malaria control in Emergencies Field Manual

Upcoming priorities

❑ Plan to conduct similar mapping in **Tanzania**

❑ Risk of Malaria epidemics : preparedeness and response:

*Work with WHE on possibilities of malaria Grading in emergencies and epidemics

* Mapping countries on malaria epidemic dynamics (in collaboration with Regional Offices)

3e. Elimination

Progress since April 2025

Certification of malaria elimination

- **Suriname and Timor-Leste** are certified malaria-free in Q3 2025

Guidance

- First-ever global guidance on preventing re-establishment of malaria transmission is published

Publications

- *Towards a malaria-free world* has been published: Elimination of malaria and prevention of re-establishment in Tajikistan

Upcoming priorities

Certification of malaria elimination

- Certification of **Oman, Qatar and Turkiye**

Normative work

On going nalization and publishing t**he second edition** of the Framework for malaria elimination continues **(Q2, 2026)**

- Initiating the work on **the third edition** of the Preparing for certification of malaria elimination manual (Q3, 2026)
- Updating *Malaria elimination course* on WHO Academy platform (Q4, 2025)

Meetings

- Technical consultation on **subnational verification** of Malaria Elimination (virtual), December 2025

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3f. Strategic information for impact

Progress since April 2025

- **Policies published**
  - Subnational tailoring of malaria strategies and interventions(SNT)
  - Guidance on establishing a national malaria data repository(NMDR)
  - Malaria surveillance, monitoring and evaluation: a reference manual (SME) , second edition
  - Online courses for **"Malaria: Harnessing the power of routine health facility data**" published in English and French

- **Malaria trends and emerging threats monitored**
  - Data collected, validated and analysed for **2025 WMR** (following simplification of data collection forms).
  - Update to **Malaria Threat Maps (MTM)** with new data added on insecticide resistance, *Pfhrp23* deletions, antimalarial therapeutic efficacy
- **Surveillance systems and capacity strengthening**
  - Digitization of s**urveillance assessment toolki**t ongoing with new developers

Upcoming priorities

- **Policies formulation**
  - Dissemination and monitoring the uptake at the country level of published guidance (**SNT , SME , NMDR)**

- **Malaria trends and emerging threats monitored**
  - Publication of the **2025 WMR (Dec)** using revised structure with Malaria drug resistance as special chapiter for advocay purpose

- **Surveillance systems and capacity strengthening**
  - Release of the electronic version of the surveillance assessment toolkit ongoing
  - Formulation of the surveillance strengthening roadmap

- **Key convenings**
  - **MSI-TAG**, on revising the burden of disease estimates (Q4, 2025)
  - **Technical consultation on molecular surveillance** (Q1, 2026)

4. Follow up from MPAG April 2025

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4. Examples of follow up from April 2025 MPAG conclussions:

i. **Elimination**: definitions of "human malaria" and "zoonotic malaria" have been submitted to the WHO Drafting Committee on Malaria Terminology.

ii. **SNT manual**: All MPAG concluding comments were addressed:
- feedback from national malaria programmes has been incorporated
- navigation of the document has been simplified
- complementarity with other WHO guidance has been clarified
- costing components have been finalized
- equity considerations have been integrated into the manual

iii. **Sub regional networks**: WHO, RBM and partners are mobilizing resources to operationalize the drug resistance networks

iv. Health equity and gender equality: contributing to organization efforts e.g. Indigenous people and pesticides risk management, gender mainstreaming in vector control product regulation

v. During this MPAG you will hear more **on areas that were highlighted at the April meeting**: (i) multiple data sources to inform evidence-based decisions for vector control tools; (ii) Global Plan for Insecticide Resistance Management; (iii) compendium of malaria drug resistance molecular markers; (iv) Operationalisation of Multi-First Line Treatment

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Updates on High-Burden High Impact (HBHI)

Malaria epidemics and emergencies: the gathering storm –
a perfect convergence of threats to global malaria control and elimination

1. Background

This note provides MPAG with updates in three critical areas:

1. progress on the accelerated malaria mortality reduction guidance in high-burden countries under the Yaoundé Declaration;
2. possibilities of widespread malaria epidemics (upsurge) in African and East Mediterranean Regions in particular; and
3. the release of new WHO guidance on "Malaria control in emergencies".

Together, these updates aim to equip MPAG with a clear understanding of current progress and emerging threats, enabling actionable recommendations to sustain momentum and keep malaria high on global and regional agendas.

2. Progress on Yaoundé Declaration: guidance for accelerated malaria mortality reduction

Adopted in March 2024, the Yaoundé Declaration seeks to realign progress with GTS goals by 2030 under the theme "no one should die from malaria". It emphasizes stronger political will, financing, data-driven action, updated guidance, coordination, health system strengthening and innovation. Yet, like past regional declarations, it risks missing targets due to shrinking funds, increasing conflicts and competing priorities. WHO, with its limited resources, is supporting countries to integrate these commitments into national plans with two priorities:

- **Embedding the Yaoundé Accountability Framework**
  - Standardized accountability framework developed and shared with countries.
  - With the RBM Partnership, three countries (Cameroon, Nigeria, Uganda) created performance frameworks with indicators and monitoring processes.
  - Engagement of African civil society and parliamentarians to enhance accountability.
- **Developing strategies for accelerated mortality reduction**
  - Concept note for mapping malaria deaths at country level to guide mitigation strategies.
  - Pilots in Ghana and Uganda, with pre-reads of findings and strategies shared.
  - Plans to undertake similar piloting in Tanzania to optimize the methods (pending funding availability)
  - Drafting SOPs to guide high-burden countries on mortality mapping.

3. Deteriorating global financial situation and risk of malaria epidemics

We face a convergence of threats that could reverse decades of malaria progress. Shrinking external funding – including shifts in United States Government (USG) support, changes in Official Development Assistance (ODA) priorities, reduced Global Fund allocations and limited domestic resources – combined with insecticide and drug resistance, weak health systems, and rising humanitarian crises is creating a "perfect storm". Earlier MAP projections suggest PMI withdrawal alone could add 15 million cases and 107 000 deaths in Africa in 2025. While temporary commodity support will last until the end of 2025, the long-term outlook remains uncertain. The recently published *America First Global Health Strategy* (September 2025) outlines a shift toward time-limited bilateral agreements, prioritization of commodities and health worker delivery services, increased domestic self-reliance through higher national co-financing, and the use of funding pauses with strict eligibility conditions *(1)*. The implications for malaria programmes include the needs for urgent action to ensure managed transitions to domestic funding, stronger country ownership and more resilient health systems. Without these, malaria morbidity and mortality will surge, especially in Africa.

WHO and partners are implementing the following actions to support National Malaria Programmes (NMPs) navigate these changes:

- Mapping previous USG-funded programmes and documenting gaps created by transitions or funding withdrawals.
- Developing national strategic plans and cost-optimized operational plans aligned with WHO guidance on prioritizing malaria interventions in resource-limited settings.
- Strengthening supply chain contingency planning with support from the Global Fund and partners such as Give Well and AMF.
- Supporting countries to diversify funding sources through engagement with other bilateral donors (e.g., China, European Union (EU), and United Kingdom) and multilateral partners such as the World Bank.
- Advocating for the fulfillment of co-financing commitments in line with the World Health Assembly (WHA76.4 2023) resolution, re-iterating previous commitments.
- Supporting the Global Fund's GC8 replenishment to secure sufficient funding both from and for malaria-endemic countries.

2.1. Monitoring malaria epidemics in endemic settings

Malaria epidemic[1] monitoring and response remain weak at all levels. Despite being the leading killer among communicable diseases in moderate- to high-transmission countries, malaria is still not treated as an epidemic threat on par with other notifiable diseases.

This contradiction is more visible for example in the WHO African a Region, where malaria caused 569 000 deaths and 246 million cases in 2023*(2)*, far deadlier than all notifiable epidemic-prone diseases combined (<10 000), a pattern expected to persist into 2025. Yet while these notifiable diseases routinely trigger immediate alerts, enormous emergency funding, surge personnel, and WHE Grading,[2] malaria outbreaks are largely managed as routine events, often reported monthly with no

[1] An epidemic refers to a rapid and marked increase in malaria incidence within an area, rising significantly above its usual or seasonal level. This term also applies to the re-emergence of malaria in areas where it was previously absent or had been eliminated (often termed as "outbreak").

[2] Grading is an internal WHO process to determine the organizational response to public health events. Grade 1 (limited response), Grade 2 (moderate response), and Grade 3 (major/maximal response), each indicating the scale and complexity

guaranteed escalation. This reveals a systemic inequity: the disease responsible for the greatest loss of life receives the weakest real-time surveillance and response mechanisms. Treating malaria with the same urgency as other notifiable diseases is not only logical but it is also a moral and public health imperative. WHO, with the advice of MPAG, should change this status quo and ensure that malaria becomes eligible for systematic epidemic grading and response.

Events based

1. *Lack of monitoring culture:* In countries transitioning from high to lower transmission, weekly epidemic monitoring systems are absent, and localized outbreaks create uncertainty about when and how to declare and respond.
2. *Absence of automatic emergency trigger:* Unlike diseases covered under the Integrated Disease Surveillance and Response (IDSR) and International Health Regulations (IHR), such as Ebola, polio or viral hemorrhagic fevers, malaria signals are often seen as routine fluctuations with no action by WHE, leading to delayed or weak responses by national authorities (Table 1).
3. *Limited integration into WHO emergency platforms:* Malaria is not systematically included in the WHO Event Management System (EMS) within the Health Emergencies Programme (WHE) as a notifiable disease. When it is considered, it is often indirectly detected only indirectly, as part of differential diagnosis during broader outbreak investigations.
4. *Political sensitivity and reluctance to declare epidemics:* Outbreaks are often underreported or their declaration delayed due to reputational, accountability or economic concerns.
5. *Poor community engagement:* Epidemic intelligence relies heavily on authorities, with weak community awareness, ownership and community-based surveillance.

Many African and Eastern Mediterranean countries have developed Subnational Tailoring (SNT) frameworks, but most proposed interventions remain unimplemented due to funding gaps. While SNT could support epidemic preparedness, limited use of surveillance data hinders timely identification and response in high-risk districts.

Table 1. Comparison of IDSR and IHR reporting, and WHO grading guidance for malaria and other infectious diseases.

Disease	Typical IDSR reporting frequency	Classification	Grading	Usual response expectation	Reference
Cholera / acute watery diarrhea (AWD)	Immediate (within 24 hours)	Epidemic-prone, notifiable	Yes (2/3)	Outbreak investigation & response within 48h	WHO-AFRO IDSR Guidelines 2019[3]; WHO-EMRO IDSR Framework 2023[4]
Measles	Immediate (suspected) + Weekly aggregate reports	Vaccine-preventable epidemic-prone disease	Yes (if it exceeds national capacity)	Case confirmation & rapid vaccination response	WHO-AFRO IDSR Guidelines 2019; WHO-EMRO Measles Surveillance Guidance
Polio (AFP surveillance)	Immediate (zero-reporting mandatory weekly)	Eradication priority	Yes	Full case investigation & lab confirmation	WHO-AFRO Polio Surveillance Guidelines; WHO-EMRO AFP Surveillance Manual

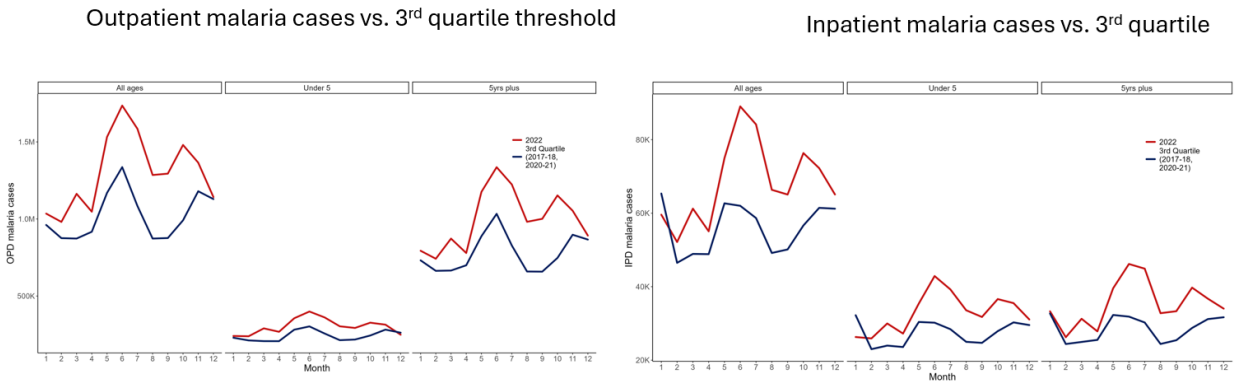
of the public health event and the necessary operational support from the Organization. WHO Emergency Response Framework. https://www.who.int/emergencies/grading

Yellow fever / viral hemorrhagic fevers (VHFs)	Immediate	High-threat IHR diseases	Yes	National alert and rapid response	WHO-AFRO IDSR Guidelines 2019; WHO IHR Reporting Protocols
Dengue / arboviral fevers	Weekly or Immediate in outbreak-prone areas	Epidemic-prone	Yes	EWARS activation and vector control	WHO-AFRO EWARS Guidance; WHO-EMRO Dengue Surveillance Guidelines
Malaria	Weekly or Monthly (often aggregate routine reporting)	Endemic disease (not consistently treated as epidemic-prone)	No (except, events in Ethiopia & Namibia 2022-24)	Often delayed or reactive response; thresholds rarely defined	WHO-AFRO IDSR Guidelines 2019; WHO-EMRO Malaria Surveillance Framework 2021

Consequently (as shown in Table 1), many endemic countries in Africa lack adequately costed and funded epidemic preparedness and response (EPR) plans and are often caught by surprise, resulting in delayed or insufficient action and high mortality.

For example, Uganda's 2022 epidemic affected 64 of 146 districts without a funded response plan or grading, resulting in approximately 3.3 million excess cases and nearly 150 000 severe cases requiring hospitalization, severely straining the health system (Fig. 1).

Figure 1. Example of malaria epidemics in Uganda in 2022 with no epidemic monitoring system



Note: The area undercurve between the red and blue lines (3rd quartile threshold observed in previous 5 years) is the excess number of malaria cases and inpatients attributed to the epidemics.
Source: *(5)*

2.2 Current epidemic status

Due to the reasons outlined above, WHO could not establish real-time, evidence-based country-level malaria epidemic status in 2025. Media reports, however, highlight worsening impacts of funding cuts in local communities of Cameroon, DRC, Uganda, Sudan (malaria and dengue) Zimbabwe indicating that this situation has now worsened *(6, 7, 8, 9, 10)*.

In Southern Africa, Botswana, Namibia, Eswatini and Zimbabwe reported major malaria upsurges. Except in Zimbabwe, these were driven primarily by delayed interventions, logistical challenges and programme gaps rather than funding shortfalls, as most countries in the region rely less on PMI support.

Many moderate-to-high transmission countries likely experienced localized malaria epidemics, but in the absence of real-time surveillance, links to funding gaps, disasters or climate anomalies remain unclear.

In the Eastern Mediterranean Region, major surges have been reported in Sudan, Yemen and Somalia, where protracted conflict, large-scale displacement and atypical rainfall patterns have intensified transmission. Meanwhile, Afghanistan and Pakistan have recorded substantial increases in malaria cases linked to mass population movements (including returnees, relapses) in Afghanistan and aftermath of flooding in Pakistan.

4. Malaria control in emergencies

The Global Malaria Programme (GMP) recently published updated guidance on malaria control in emergencies *(11)*, which supersedes the second edition published in 2013. This section attempts to update MPAG by summarizing the key challenges of malaria control in such settings, as conflicts and natural disasters are increasingly contributing to the ongoing upsurge of malaria in high-burden countries.

4.1 Humanitarian emergencies

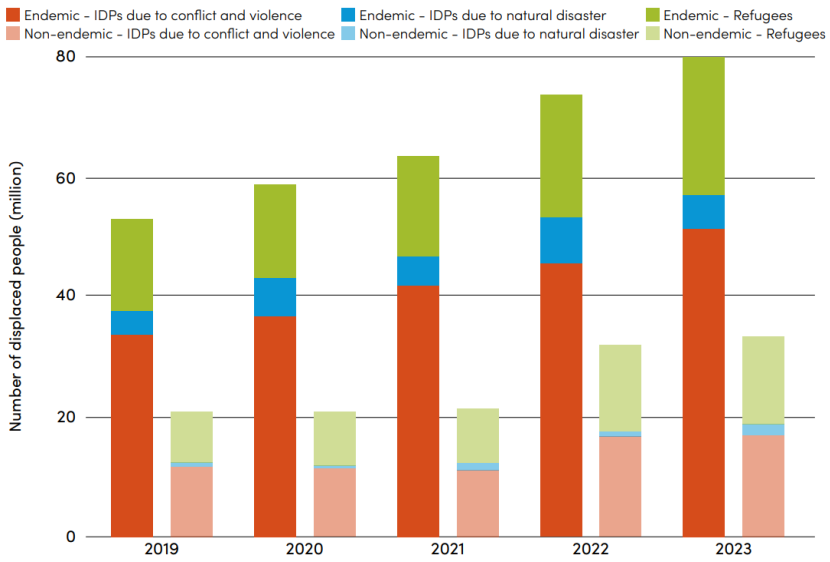
Humanitarian emergencies[3] can be caused by instability, conflict or natural disasters. In malaria-endemic countries, humanitarian crises – which typically involve displacement, food insecurity, malnutrition and health system disruptions – often trigger malaria epidemics. These outbreaks, whether malaria occurs as a primary cause or a comorbidity, result in significant excess mortality and morbidity.

Globally, a record 117 million people were displaced by the end of 2023, including nearly 80 million living in 43 malaria-endemic countries. These staggering figures reflect a rapidly shifting global landscape, in which health systems are under growing pressure and response capacity is stretched thin. The displaced population in malaria-endemic countries is almost three times larger than in non-endemic countries, underscoring the heightened burden of internally displaced persons (IDPs) (Fig. 2). This population is concentrated primarily in the African Region and secondarily in the Eastern Mediterranean Region.

A sharp increase in complex emergencies in many countries has critically exacerbated the malaria burden. High risk countries with millions affected – such as Afghanistan, Burkina Faso, Colombia, Democratic Republic of Congo, Ethiopia, Haiti, Mali, Myanmar, Niger, Nigeria, Somalia, Sudan and Yemen – are experiencing some form of conflicts fueling malaria epidemics (Fig. 3). Furthermore, Malawi, Mozambique and Pakistan face natural disasters, primarily heavy flooding, which further increases the threat of malaria upsurges. Eight of the 11 HBHI countries face varying degree of conflict leading to displacements and disruption of services.

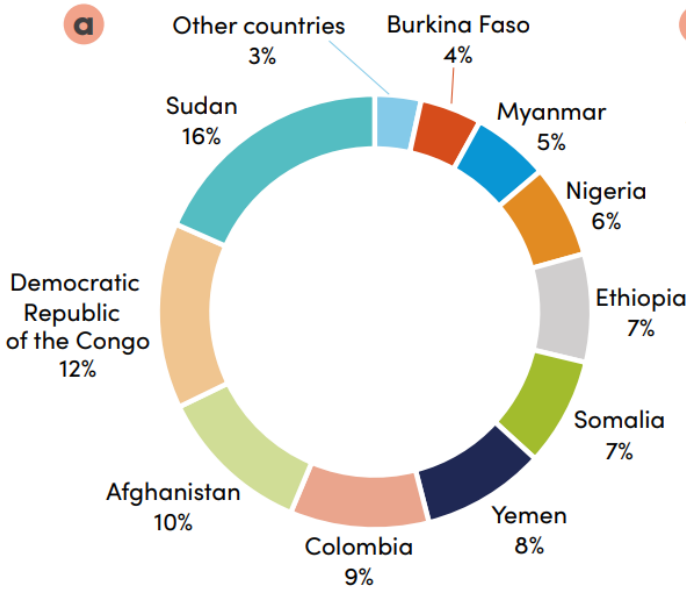
[3] ***Humanitarian emergency*** is a situation in which the functioning of a community or society is severely disrupted, causing suffering and losses that exceed the affected population's ability to cope using its own resources.

Figure 2. Comparison of displaced persons in endemic and non-endemic countries, 2019–2023



Source: *(11)*

Figure 3. Proportion of IDPs in malaria endemic countries



Source: *(11)*

4.2 Monitoring of malaria epidemics in emergencies

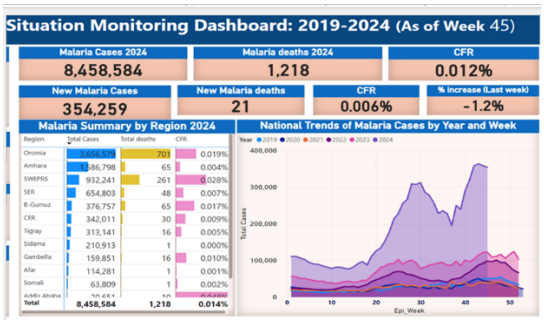
Measuring the magnitude and impact of the epidemics in emergency settings is challenging and often substantially under-reported due to disruptions in health systems and surveillance channels.

The WHO EMS under WHE targets “acute, unusual and unexpected” events, which often excludes malaria surges in endemic settings. As a result, malaria is usually captured only as part of differential diagnoses in other crises, not as a primary alert. As of August 2025, EMS recorded malaria outbreak signals in 12 countries (eight in Africa, one in the Eastern Mediterranean, three in South-Asia), but none were graded, highlighting challenges in detecting, declaring and reporting epidemics.

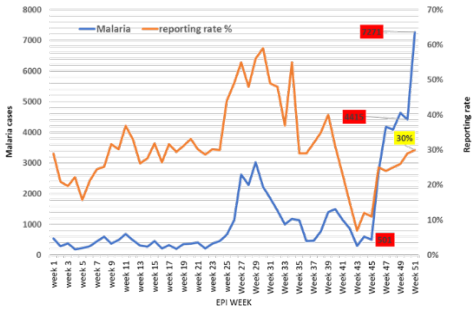
The grading[2] process that determines international response is rarely applied to malaria; Ethiopia's 2024 epidemic of over eight million cases was a rare exception, graded alongside severe malnutrition *(12)*. This illustrates how malaria is usually prioritized only when part of a broader humanitarian crisis. Despite a 30% drop in reporting and weakened health services, malaria cases in conflict-affected Tigray rose more than tenfold, revealing how outbreaks in such settings can become overwhelming without access to proper diagnostics and treatment.

Figure 4. Example of monitoring malaria epidemics in Ethiopia (partially affected by conflict) and its Tigray Region (affected by conflict)

National monitoring 2024



Tigray region



- Reporting facilities (30%) are ONLY from the less malarious and historically non-malarious districts in East, South-East and Mekelle zones.
- Exceptionally, the epidemic is on upward trend even during **JANUARY** where we expected decline.

5. Summary of dimensional crises requiring MPAG and WHO focus

The stability of malaria control is being undermined by four synergistic crises.

5.1 Shrinking financial resources in a time of growing need

The global malaria response faces a severe funding crisis, even before PMI's suspension (30-40%) of grants, with persistent funding gaps of approximately 50% in national plans over the past decade, leaving core programmes underfunded and coverage sub-optimal in high-burden countries.

- **Withdrawal/freeze of PMI's support.** The proposed FY 2026 cut by PMI – nearly 47% from US$ 805 million to US$ 424 million *(13,14)* – would create a catastrophic funding gap in the African region, as PMI's technical and commodity support is largely irreplaceable. While some countries retain limited commodity support through 2025 (the exact breakdown of the cuts is unknown), the overall outlook remains poor.
- **Declining Global Fund resources.** The Global Fund's Seventh Replenishment fell short and current grants have been cut by approximately 10% in the African Region (from US$ 9.7 billion to 8.7 billion), with major reductions in the Democratic Republic of the Congo (224 million), South Africa (134 million) and Nigeria (66 million). Combined with PMI cuts, this further constrains malaria funding.
- **Donor fatigue and shifting priorities.** Post-COVID fiscal pressures, climate, conflict and geopolitical crises are diverting resources from malaria, with many traditional donors reducing their global health commitments.
- **Limited fiscal space and insufficient political commitment constrain domestic resource mobilization.** Most endemic countries struggle to secure domestic funding for malaria due to restricted fiscal space and macroeconomic pressures. High debt burdens crowd out health spending, competing priorities dilute political attention, and complex public financial management systems often result in delayed procurements and low budget absorption.

5.2 Growing humanitarian crisis in high burden countries and diminishing response capacities

The global capacity for humanitarian response is diminishing just as needs are escalating. Key challenges include:

- **Shrinking operational presence.** Closure of USAID missions and downsizing of NGOs in conflict zones have left millions without malaria prevention and treatment, with South Sudan serving as a stark example.
- **Exacerbation by climate change.** More frequent floods and cyclones are creating breeding sites and displacing populations, straining fragile health systems and triggering epidemics in previously stable areas.
- **Political conflicts.** Conflicts displace populations into malaria-endemic zones, disrupts health systems and supply chains, destroy infrastructure, cause the departure of technical partners and national experts, health and divert national budgets from health to defense. Examples include the Central African Republic, the Democratic Republic of the Congo, Ethiopia, northern Nigeria, Sahel countries, South Sudan, Sudan, etc.

5.3 The biological threat: widespread resistance

The tools that drove progress in malaria control are rapidly losing efficacy.

- **Insecticide resistance.** Pyrethroid resistance is now widespread across Africa, while rollout of next-generation insecticides and nets lags behind, leaving millions of people vulnerable.
- **Emerging drug resistance.** Partial artemisinin resistance (*pfkelch13* mutations) confirmed in Rwanda, Uganda and beyond, poses a game-changing threat. Without aggressive containment, first-line treatments could fail, driving higher mortality.

Deterioration of partners, WHO and national programmes capacities

- **Partners.** As global health funding shrinks, many key donors and NGOs have reduced their engagement and operational support for malaria response.
- **WHO.** Recent financial crises have severely reduced WHO's operational capacity, with expert staffing cut across all levels – particularly in the African and Eastern Mediterranean Regions. Malaria National Programme Officers are increasingly overstretched or reassigned to multiple disease areas. In response, WHO is undergoing restructuring to protect core technical functions and deliver more strategic, integrated support to high-need countries.
- **National programmes.** Reliance on external support has left NMPs weak, with limited subnational capacity, fragile surveillance, loss of expertise and frequent stockouts. If trends continue, they will struggle to sustain routine control, let alone manage crises.

6. Proposed recommendations for MPAG Action

The following recommendations are proposed for MPAG's consideration to advocate for immediate, high-level action to reverse the rising trend of malaria and avert a massive humanitarian and public health disaster in high-risk countries.

For Member States

1. **Strengthen surveillance.** Upgrade to weekly, real-time epidemic monitoring and integrate climate-linked early warning systems and use SNT for prioritizing epidemic-prone areas.
2. **Institutionalize grading.** As part of IDSR, establish a formal grading system to declare malaria epidemics as public health emergencies, with predefined thresholds that trigger automatic financing and response at national and subnational levels.
3. **Adopt emergency policies and logistics strategies.** Fast-track policy updates and preposition essential tools (diagnostics, medicines, vaccines, PBO nets, IRS formulations, dual-active nets, blood transfusions and repellents for emergency use). The use of malaria vaccines in priority areas should also be considered, taking into account the repeated doses required relative to the duration of epidemics and emergencies.
4. **Increase and diversify domestic resources.** Institutionalize innovative resource mobilization, including taxation, philanthropic support, mandating the private sector co-financing tied to extractive and agricultural sector licenses in high-burden zones.
5. **Mobilize communities.** Institutionalize community epidemic response brigades trained for surveillance, commodity distribution and crisis communication.

For WHO leadership

6. **Revise IDSR and establish malaria grading.** Develop a formal grading system within WHE to better integrate malaria into emergency operations, ensuring standardized response and rapid deployment of technical support, capacity building and resources (see definition[2] and Table 1).
7. **Prepare contingency plan for global emergency appeal.** The Malaria and NTD Department, in collaboration with WHE and Regional Offices, should develop systems and contingency plans for surges that exceed national capacity, including the option of a formal global appeal by the WHO Director-General.
8. **Stabilize programme delivery in transitioning countries.** Coordinate gap assessments, prioritization plans and supply chain contingency support.

   Secure sustainable financing by diversifying donor engagement, upholding domestic co-financing, and backing Global Fund GC8 replenishment.

For global partners and donors

9. Establish a malaria emergency financing window, built on the Global Fund's strategic initiatives on RSSH and pandemic preparedness, and response and supported with catalytic funding. Integrate it into humanitarian or crisis-response funding systems to allow rapid disbursement.
10. Adopt dual-track financing models, combining baseline (non-epidemic) control funds with emergency reserves to ensure timely epidemic response.

7. Conclusion

Malaria control in high burden countries is at a tipping point, facing a convergence of crises: severe funding cuts, fragile health systems, escalating humanitarian emergencies, and growing insecticide and drug resistance. These pressures are weakening surveillance, disrupting supply chains, reducing access to essential commodities, and leaving countries dangerously unprepared for epidemics.

Recent surges demonstrate that without urgent, high-level action, progress toward the targets of the *Global technical strategy for malaria 2016–2030* will not only stall but could reverse, risking the collapse of health systems and the loss of two decades of hard-won gains. Incremental measures are no longer sufficient. This is the moment for MPAG and WHO to sound the alarm and galvanize a decisive response from Member States, communities and partners to prevent a reversal of progress and protect the most vulnerable.

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Updates on HBHI
Malaria Epidemics and Emergencies

Dr Maru Aregawi
Unit Head
Vector, Disease Control, Elimination/Eradication (VCE)
Malaria and NTD (MNT) Department

28th Meeting of the WHO Malaria Policy Advisory Group (MPAG)
Virtual meeting, 14–16 October 2025

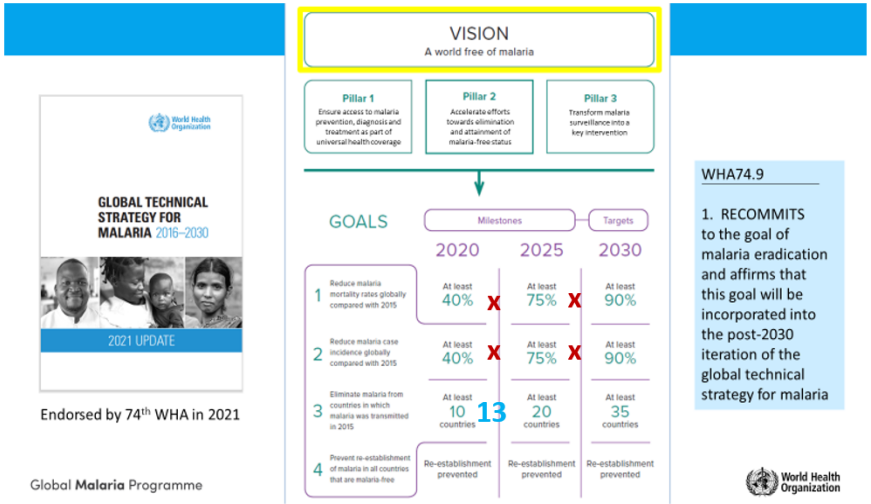
Outline

1. Progress on Yaoundé Declaration
2. Risk of widespread malaria epidemics
3. Highlights of the New WHO guidance on malaria control in emergencies
4. Suggested recommendations for consideration

1. Updates on HBHI

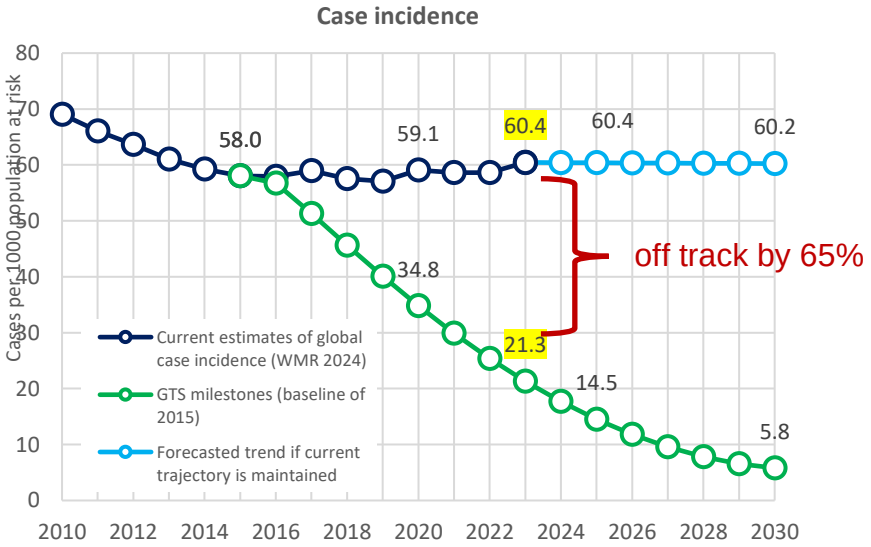
Global progress--off track

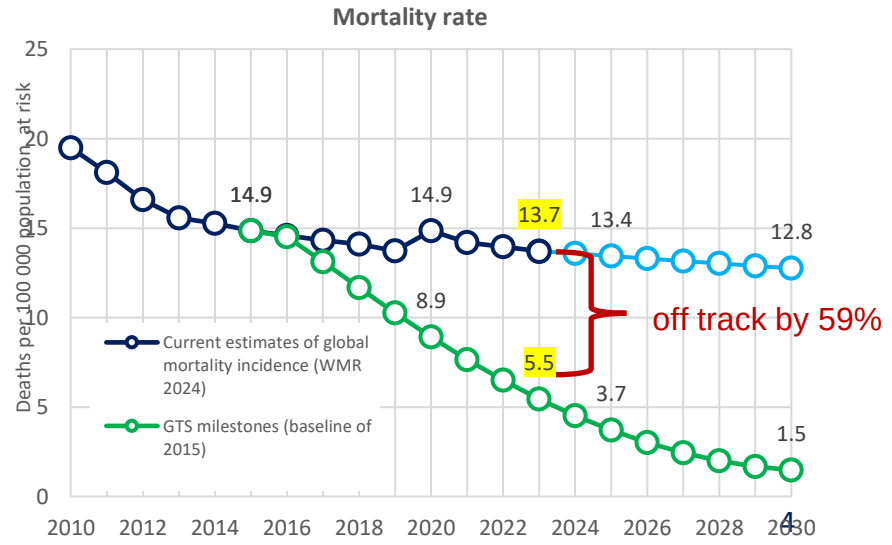
- **Progress towards GTS targets remains off track:**
  - Estimated cases: 263 million
    - **60.4/1000** against a target **21.3/1000**
  - Estimated deaths:597 000
    - **13.7/**100 000 against a target **5.5/100,000**
  - **Gap projected to grow**
  - **11 countries** account for >70% of the burden



93➔ 83
Number of endemic countries

(WMR, 2024)



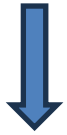


Progress update on the Yaoundé Declaration (March 2024)

- **Goal:** To get the world back on track to achieve GTS milestones and sustain gains to reach the GTS goals by 2030.
- **Key commitment:** End Malaria-related mortality by reinforcing the HBHI approach
- **Promised actions of the declaration**
  - **Strengthening political will**
  - **Ensuring strategic use of information for action**
  - **Providing better technical guidance**
  - **Enhancing coordination and multisectoral action**
  - **Strengthening national health systems**
  - **Collaborative partnerships** for resource mobilization, research and innovation:

World Health Organization

WHO's support for Accelerated Malaria Mortality reduction (AMMR)



Concept note consolidation

Consolidation of the conceptual framework

Mortality Mapping in one HBHI country

- Polit Mortality Mapping in at least two HBHI countries (different settings, Ghana, Tanzania, Uganda)
- Generate qualitative and quantitative evidence on drivers on mortality (Ghana…)
- Develop mitigation strategies

Developing SOP for Mortality Mapping

- Detailed steps on qualitative analysis
- Quantitative measurements on effect size of each driver of mortality
- Prioritization of drivers to be tackled

Country level mortality mapping (All HBHI countries)

1. Initiate mortality mapping in each of the respective HBHI country
2. Involve local and external academia to ensure validity and quality of the mapping
3. Determine and prioritize drivers of mortality

Develop Mitigation strategies for AMMR

- Develop mitigation strategies for each of the driver, guided by the mortality mapping
- Outline the systems and coordination mechanisms to ensure implementation and accountability
- Develop communication strategies

Implement Accelerated mortality reduction (AMMR)

- Follow the national strategies developed for AMMR
- Engage political and sectoral leadership in the implementation
- Monitor progress
- Dynamically assess and update the status of the drivers and adjust strategies accordingly
- Evaluation of the AMMR

World Health Organization

Progress

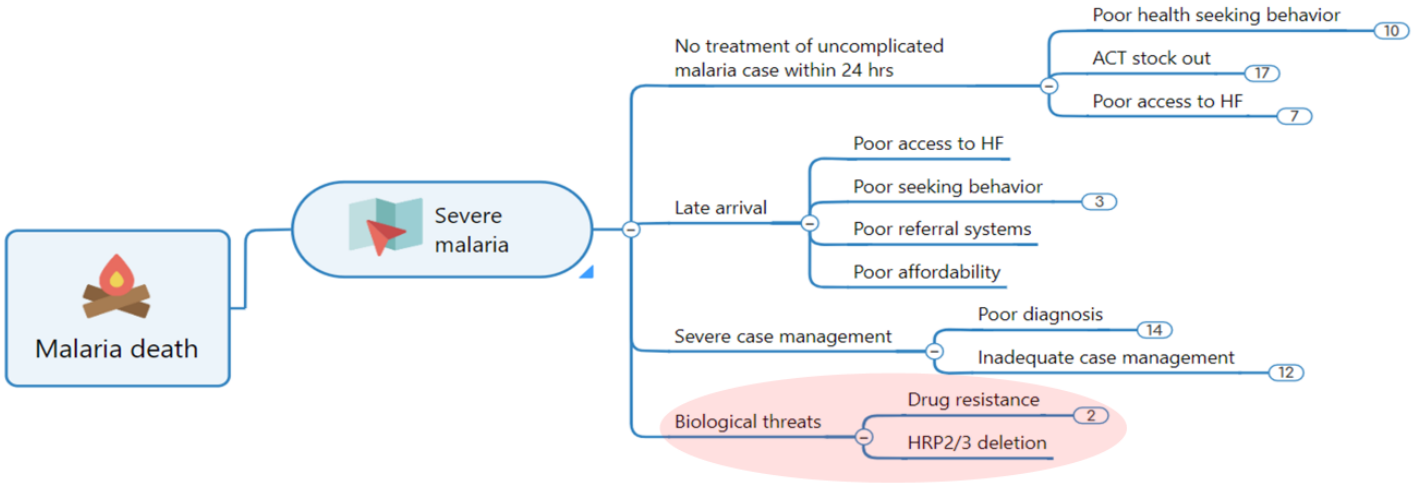
- **Embedding the Yaoundé Accountability Framework**
  - Standardized accountability framework developed and shared with countries.
  - With RBM, three countries (Cameroon, Nigeria, Uganda) created performance frameworks with indicators and monitoring processes.
  - Engagement of African civil society and parliamentarians to enhance accountability.
- **Developing strategies for accelerated mortality reduction**
  - Concept note for mapping malaria deaths at country level to guide mitigation strategies
  - Piloting in Ghana and Uganda
  - Plan to conduct similar mapping in Tanzania
  - Progress is slow due to unavailability of resources to facilitate the process in all HBHI countries (both in WHO and RBM)

Ghana

SOP for critical mapping for accelerated malaria mortality reduction

Objective: **To enable NMCPs in moderate-high transmission settings identify and understand the various factors contributing to malaria-related deaths.**

By recognizing these social, technical, and operational factors, the aim is to prioritize and take action to mitigate the primary drivers of malaria mortality within their healthcare systems.



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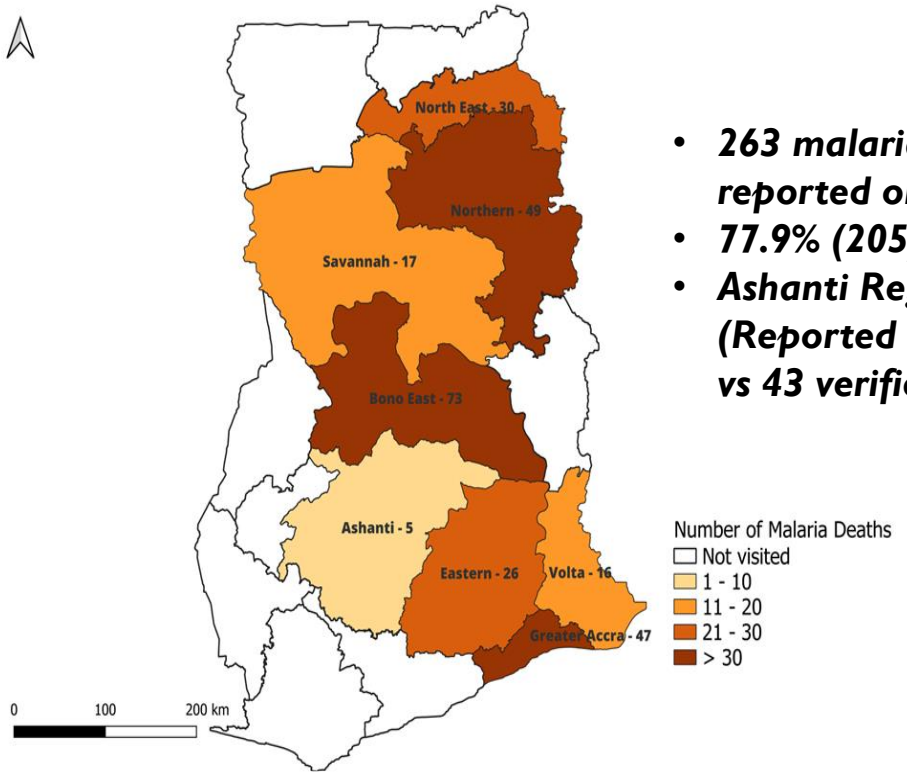
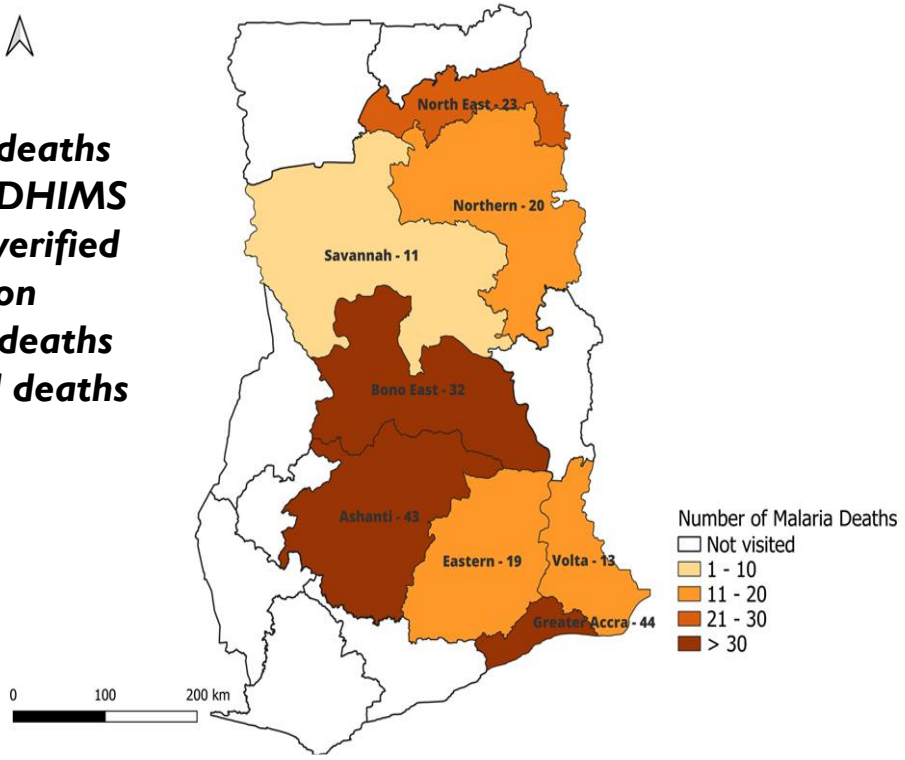
Mapping of malaria mortality in Ghana
Reported and Verified Malaria Mortalities in the selected regions



- ***263 malaria deaths reported on DHIMS***
- ***77.9% (205) verified***
- ***Ashanti Region (Reported 5 deaths vs 43 verified deaths***



Distribution of deaths reported from Jan 2021 – June 2024

Distribution of deaths verified from Jan 2021 – June 2024

Characteristics of verified malaria mortalities in selected health facilities across Ghana

.

Malaria death	Frequency (N = 205)	Proportion (%)
Age (Median, IQR)	5.0 (2.0-12.0)	
Age (In years)		
Under 5	100	48.8
5-14	58	28.3
15 and above	47	22.9
Sex of patient		
Female	96	46.8
Male	109	53.2
Religion		
Christianity	89	43.4
Islam	35	17.1
Traditionalist	0	0
Missing	81	39.5
Health insurance status		
Non-Insured	84	41
Insured	121	59.02
Health insurance validity		
Expired	4	3.3
Valid	117	96.7

Results: Ghana

Comparison of Deaths Reported and Verified During Field Visit in selected regions

Region	Deaths reported	Deaths verified	Absolute Difference	Variance (%)
Bono East	73	32	41	56.2
Eastern	26	19	7	26.9
Savanna	17	11	6	35.3
Volta Region	16	13	3	18.8
Northern	49	20	29	59.2
North East	30	23	7	23.3
GAR	47	44	3	6.4
Ashanti	5	43	-38	760.0
Total	**263**	**205**	**58**	**22.1**

	No Data Quality Issue - Variance < 10%
	Minor Data Quality Issue Variance 10 - 30%
	Major Data Quality Issue - Variance > 30%

Top Seven (7) Health Facilities Accounting for Most Malaria Deaths over the period

Of the 32 health facilities visited, only 7 health facilities accounted for more than half 62.9% (129) of the 205 malaria deaths verified

Health Facility	Region	Number of deaths
Komfo Anokye Teaching Hospital	Ashanti	40
Baptist Hospital	North East	23
37 Military Hospital	Greater Accra	20
St Theresa Hospital-Nkoranza	Bono East	20
Tamale Teaching Hospital	Northern	10
Central Gonja District Hospital	Savanna	8
Sene District Hospital	Bono East	8

Drivers of Malaria Mortality among Patients 1/2

Variables	Outcome: Died	Outcome: Recovered	Unadjusted OR (95% CI)	P-value	Adjusted OR (95% CI)	P-value
Health insurance status						
Non-Insured	84 (57.14)	63 (42.86)	1.00			
Insured	121 (30.56)	275 (69.44)	0.33 (0.22 - 0.49)	<0.001	0.11 (0.01 - 1.38)	0.163
Referral						
Late	4 (9.76)	37 (90.24)	17.5 (5.37 – 56.81)	0.001	10.24 (2.62 – 39.43)	**0.001**
Early	34 (65.38)	18 (34.62)	1.00		1.00	
Delay in blood transfusion						
No	27 (29.67)	64 (70.33)	1.00			
Yes	30 (51.72)	28 (48.28)	2.54 (1.28 – 5.03)	0.008	2.62 (1.32 – 5.28)	**0.007**
Patient triaged on admission						
No	54 (51.92)	50 (48.08)	1.00			
Yes	134 (35.45)	244 (64.55)	0.75 (0.61 - 0.93)	0.002	0.36 (0.03 - 3.70)	0.444
Presence of chronic illness/condition						
No	112 (30.11)	260 (69.89)	1.00			
Yes	93 (54.39)	78 (45.61)	2.76 (1.90 - 4.02)	0.001	2.51 (1.21 – 5.24)	**0.014**
Effectiveness of the system						
No	140 (65.12)	75 (34.88)	7.6 (5.11 – 11.16)	0.001	9.77 (2.88 – 33.10	**0.001**
Yes	65 (19.82)	263 (80.18)	1.00		1.00	

Independent Population Attributable Risk (IPAR) of Malaria Mortality

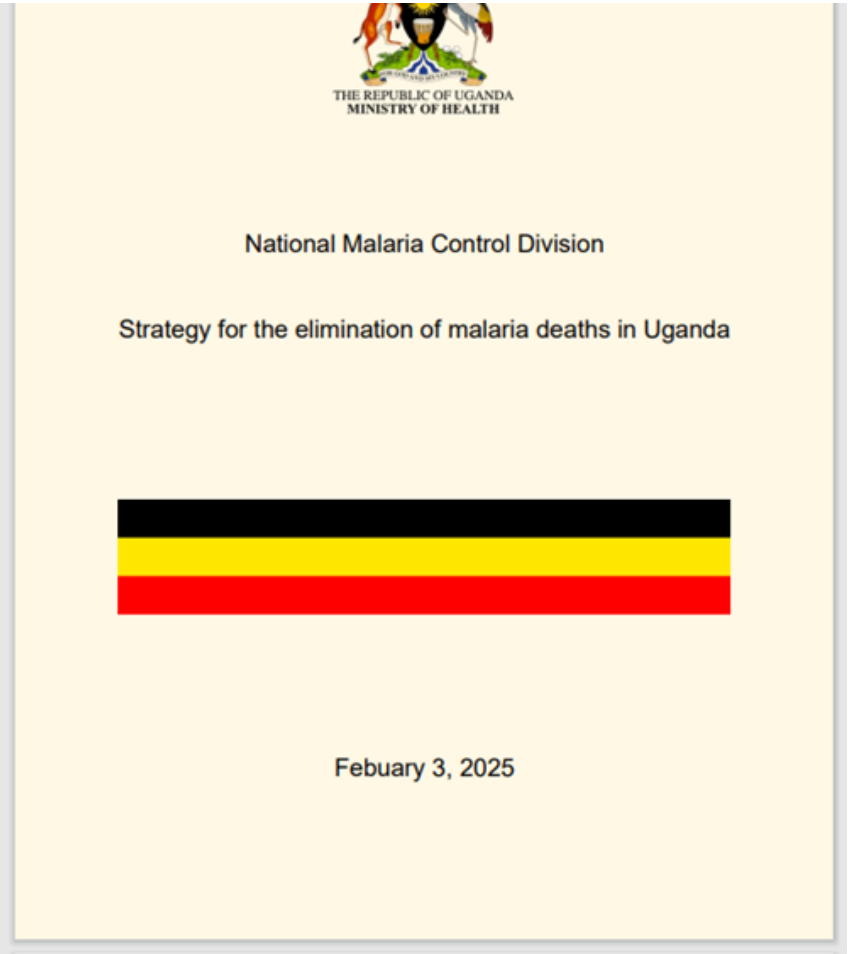
Risk Factor	Adjusted Odds Ratio	Prevalence among deaths (%)	IPAR (%)	Combined Independent Population Attributable Risk
Underlying health condition	2.54	45.4	26.36	
Delayed transfusion	2.62	52.6	31.94	91.87%
Poor management	9.77	68.3	59.68	
Delayed referral	10.24	67.3	59.29	

- ***Poor management of admitted cases of malaria (IPAR = 59.7%) had the highest attributable risk***
- ***59.3% of malaria deaths could be prevented if prompt referral systems were in place***
- ***31.9% of deaths could be potentially preventable through timely blood transfusions***
- ***Nearly one-quarter of malaria-related deaths are attributable to underlying comorbidities (IPAR = 26.4%)***
- ***Overall, the combined Independent Population Attributable Risk of 91.9% indicates that if all four identified risk factors; underlying health condition, delayed transfusion, poor management, and delayed referral were effectively addressed, 92% of all deaths could be averted***

Based on the results, Ghana is preparing Mitigation Strategy for accelerated malaria mortality Reduction (AMMR)

Uganda

- Conducted literature review of drivers of malaria mortality in Uganda
- National dialogue of key stakeholders
- Consensus on key drivers
- Developed strategic direction to end malaria deaths
- Goal: To reduce malaria mortality to zero by 2030.



Key drivers of malaria deaths in Uganda

Delayed Care Seeking: Seeking care >24 hours after fever onset increases severe malaria risk 5x.

Inappropriate Health-Seeking Behavior: Self-treatment, use of drug shops, and misdiagnosis.

Poor Case Management:

Uncomplicated Malaria: Stock-outs, false-negative tests, non-adherence to treatment.

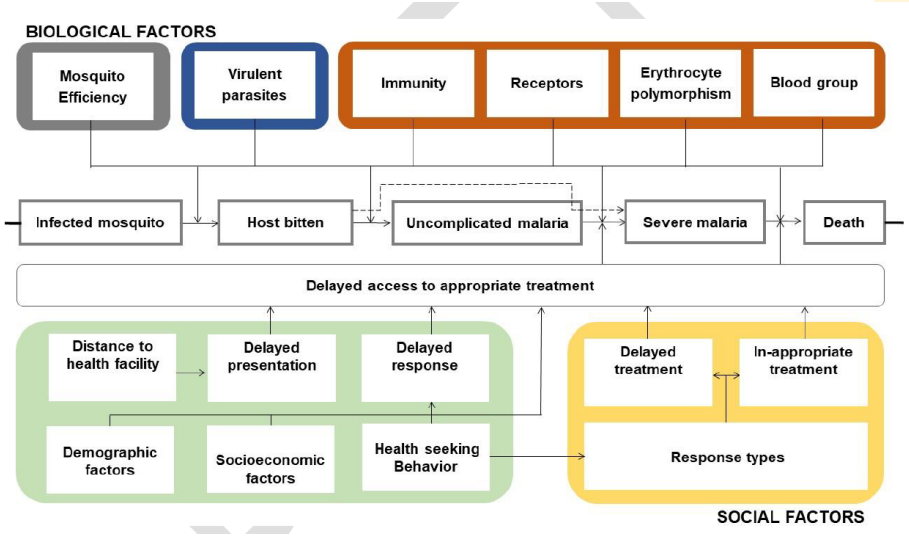
Severe Malaria: Delayed diagnosis, inadequate management of complications, incomplete treatment.

Health System Gaps: Weak supply chain, limited financing, insufficient data use, and ineffective referral systems.

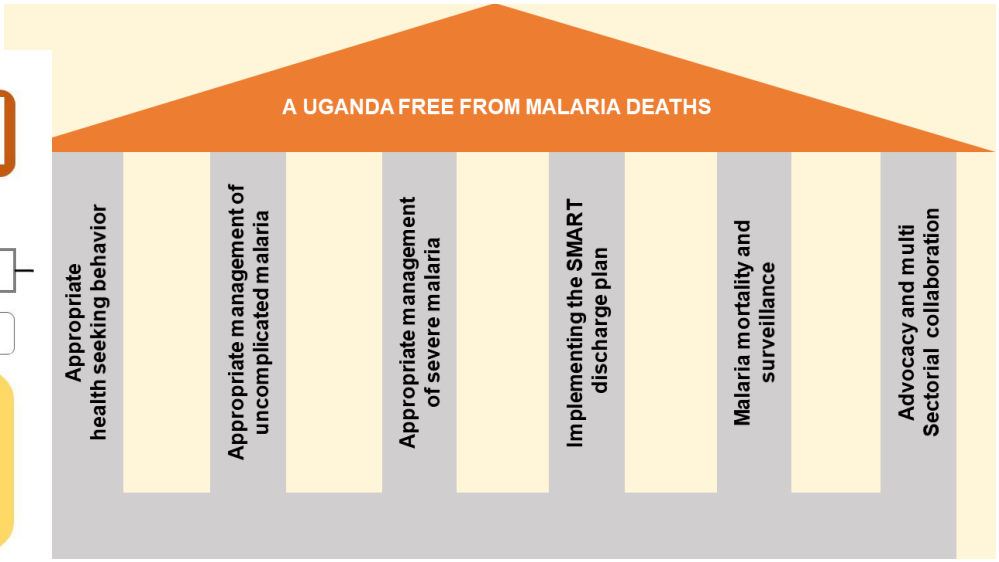
Emerging Threat: Partial artemisinin resistance.

Caveat: No ranking or quantification of these drivers was possible

Uganda: Strategy for elimination of malaria deaths



Determinants of severe malaria and deaths in Uganda

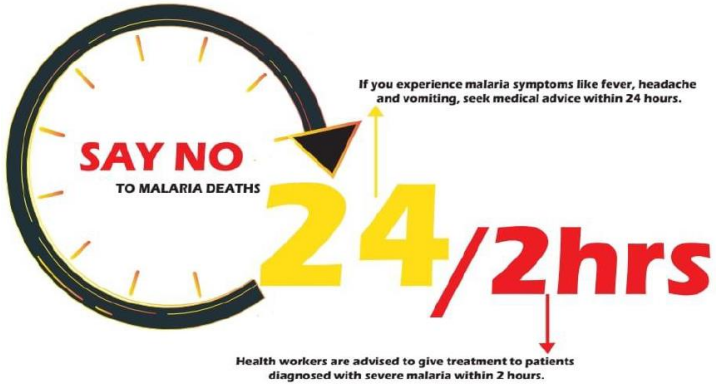


Six strategic pillars for the elimination of malaria deaths in Uganda

Uganda

Mitigation strategy

- Strong Government Commitment
- 24/2 initiative launched
  1. Treated uncomplicated malaria within 24 hours
  2. Treat and manage severe cases within 2 hours of onset of danger signs.
- Embedded into the NSP
  - To start with piloting➔ scale-up
  - Resource mobilization



24/2 hours Initiative

To reduce malaria mortality in Uganda

Nov 2024

2. Updates on malaria epidemics and emergencies

Perfect storm and risks of malaria epidemics

- **The Situation:** We are facing a rapid, global deterioration of the malaria situation.
- **Converging threats:**
  - **Financial cataclysm:** Shrinking/shifting of major funding
    - USG funding: Temporary commodity support until end-2025 – long-term outlook uncertain
      - Short-term supply chain disruptions, loss of CHWs, case management and surveillance
    - Reductions-Global Fund: ~1 USD Billion in the African Region.
  - **Fragile health systems:** Weakened national programmes and surveillance.
  - **Humanitarian crises:** Record displacement and conflicts fueling epidemics.
  - **Biological threats:** Widespread insecticide & emerging drug resistance in Africa.

- **The impact:** This perfect storm risks reversing decades of progress and may lead to a significant surge in cases and deaths.

World Health Organization

Weak Epidemic Monitoring

- Malaria not treated as epidemic-prone despite highest mortality
  - 2023: 569K deaths, 246M cases vs <10K from all notifiable epidemic diseases (cholera, measles, VHF, Dengue,
  - Other diseases trigger rapid alerts, malaria seen as routine
- Systemic inequity – needs grading, emergency response

Current Epidemic Status

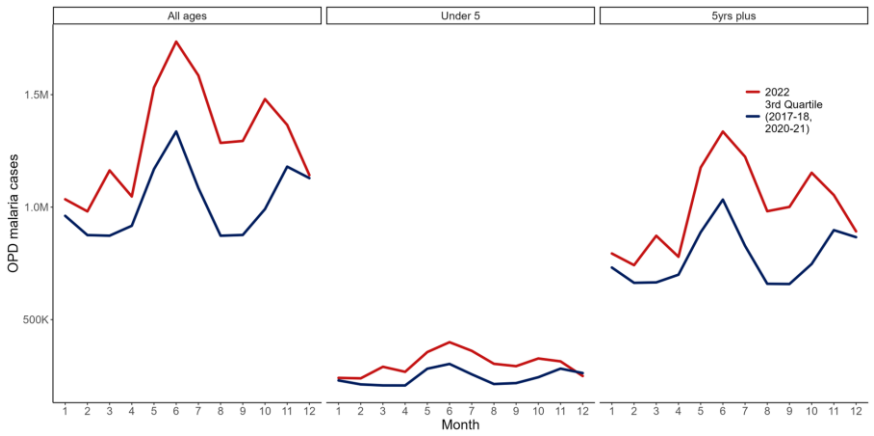
- WHO could not establish real-time epidemic status in 2025
- Media: worsening impacts in Cameroon, DRC, Uganda, Sudan, Zimbabwe, Ethiopia (2024/25)
- Southern Africa: Botswana, Namibia, Eswatini, Zimbabwe upsurges
- EMR: surges in Sudan, Yemen, Somalia, Afghanistan, Pakistan
- Status unknown for many high-burden countries (most epidemics are subnational affecting a few districts, rarely national), and hence not reported

Monitoring, reporting and grading of malaria and other notifiable diseases (IDSR)

Disease	Typical IDSR Reporting Frequency	Classification	Grading	Usual Response Expectation	Reference
Cholera / Acute Watery Diarrhea (AWD)	Immediate (within 24 hours)	Epidemic-prone, notifiable	Yes (2/3)	Outbreak investigation & response within 48h	WHO-AFRO IDSR Guidelines 2019; WHO-EMRO IDSR Framework 2023
Measles	Immediate (suspected) + Weekly aggregate reports	Vaccine-preventable epidemic-prone disease	Yes (if it exceeds national capacity)	Case confirmation & rapid vaccination response	WHO-AFRO IDSR Guidelines 2019; WHO-EMRO Measles Surveillance Guidance
Polio (AFP Surveillance)	Immediate (zero-reporting mandatory weekly)	Eradication priority	Yes	Full case investigation & lab confirmation	WHO-AFRO Polio Surveillance Guidelines; WHO-EMRO AFP Surveillance Manual
Yellow Fever / Viral Hemorrhagic Fevers (VHFs)	Immediate	High-threat IHR diseases	Yes	National alert and rapid response	WHO-AFRO IDSR Guidelines 2019; WHO IHR Reporting Protocols
Dengue / Arboviral Fevers	Weekly or Immediate in outbreak-prone areas	Epidemic-prone	Yes	EWARS activation and vector control	WHO-AFRO EWARS Guidance; WHO-EMRO Dengue Surveillance Guidelines
Malaria	Weekly or Monthly (often aggregate routine reporting)	Endemic disease (not consistently treated as epidemic-prone)	No (except, events in Ethiopia (2022-24)	Often delayed or reactive response; thresholds rarely defined	WHO-AFRO IDSR Guidelines 2019; WHO-EMRO Malaria Surveillance Framework 2021

Example of malaria epidemics in Uganda in 2022 with no epidemic monitoring system

Outpatient malaria cases vs. 3rd quartile threshold



Inpatient malaria cases vs. 3rd quartile

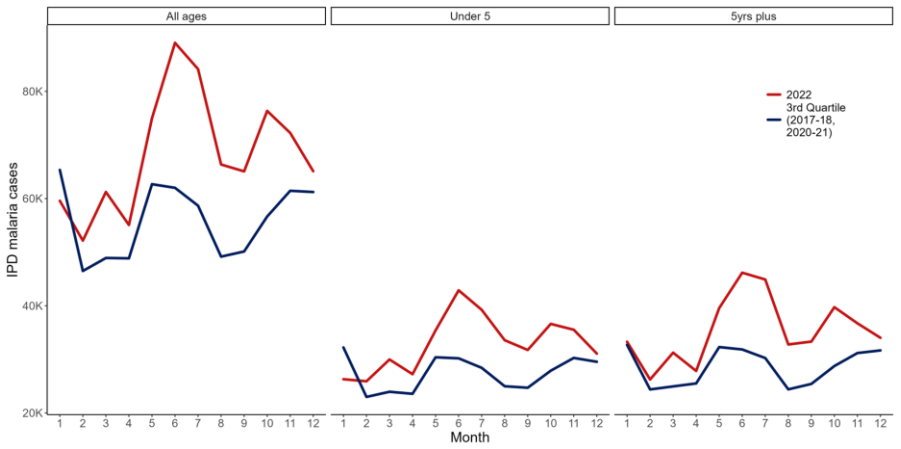
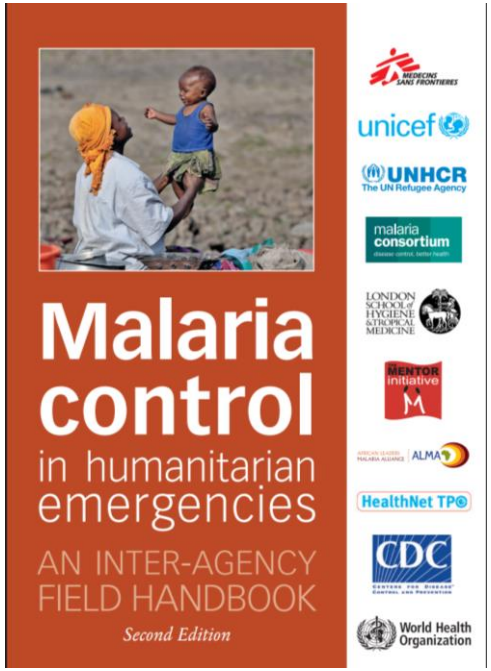


Table 2: Monthly and cumulative malaria indicator excess in 2022 attributed to epidemics compared to the 3rd quartile using AUC.

	Outpatient		Confirmed Cases		Inpatient		Deaths	
Month	Year 2022	3rd Quartile (2017-2021)	Year 2022	3rd Quartile (2017-2021)	Year 2022	3rd Quartile (2017-2021)	Year 2022	3rd Quartile (2017-2021)
1	1034815	961260	934173	876199	59583	65340	320	400
2	981107	875683	893852	792066	52154	46488	320	288
3	1163182	873092	1023479	794085	61232	48913	250	248
4	1047346	917119	940008	829005	55071	48852	260	244
5	1531759	1169054	1381510	1077382	74978	62679	297	295
6	1735611	1336424	1567098	1224983	89052	62003	288	313
7	1585215	1084731	1451242	1008437	84151	58672	287	324
8	1285450	872978	1168992	790443	66355	49167	261	285
9	1294108	876324	1183020	787047	65072	50128	268	284
10	1480166	991277	1320045	891139	76353	56646	268	256
11	1365372	1179974	1252337	1065919	72248	61448	268	353
12	1142072	1128980	1047180	1007313	65094	61219	268	277
Total	15646203	12266894	14162936	11144016	821343	671554	3355	3565
Difference (CI)	3379309 (1553714, 5339709)		3018920 (1321951, 4661201)		149789 (66029, 235743)		-210 -578.45, 108.05)	

Malaria Control in Emergencies: Field Manual

10 September 2025

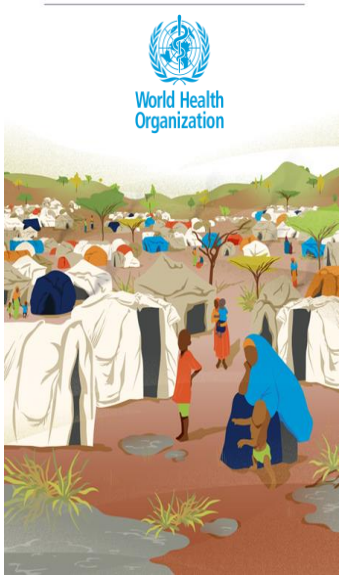


2013 version
Superseded by

THE GLOBAL FUND

LONDON SCHOOL of HYGIENE &TROPICAL MEDICINE

UNHCR
The UN Refugee Agency



THE MENTOR Initiative

Ollscoil na Gaillimhe
University of Galway

unicef
for every child

Malaria control in emergencies

Chapter 1. Malaria epidemiology and control in emergencies

Chapter 2. Coordination

Chapter 3. Diagnosis and case management

Chapter 4. Chemoprevention

Chapter 5. Vector control

Chapter 6. Risk communication and community engagement

Chapter 7. Operational research

Chapter 8. Surveillance, monitoring and evaluation

- **Merits Updates epidemiology and defines at-risk populations**
- **Provides step-by-step emergency response roadmap**
- **Integrates malaria control with humanitarian coordination**
- **Adapts latest WHO guidance for crisis settings**
- **Includes practical field tools and examples**
- **Promotes operational research for emergencies**
- **Adds procurement and costing templates for responses**

Facets of malaria in control in emergencies

• POPULATION DISPLACEMENT → NON-IMMUNE GROUPS AT RISK

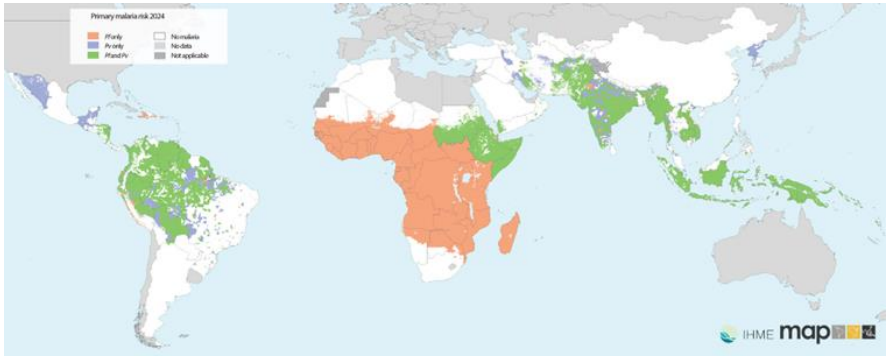
• FLOODS & EXTREME WEATHER → EXPANDED BREEDING SITES

• CONFLICT & DISRUPTED SERVICES → EPIDEMICS IN HIGH TRANSMISSION ZONES

• COINFECTIONS (EBOLA, FEBRILE ILLNESSES, MALNUTRITION) COMPLICATE RESPONSE

Context

- 117M+ forcibly displaced persons globally
- Nearly 80M in 43 malaria-endemic countries



Emergency contexts in Africa are often defined by a convergence of:

- Dominant *P. falciparum* malaria
- Acute and protracted crises, conflict, and climate-driven disasters fuel malaria risks
- Health systems often collapse early in emergencies
- Non-immuned population moving to high transmission are at higher risk of severity and mortality
- Comorbidities of malaria with malnutrition and other acute infections ➔increase mortality

- Number of IDPs is almost three times larger in malaria-endemic countries than in non-endemic countries
- Majority of IDPs and refugees are concentrated primarily in the African Region and secondarily in the Eastern Mediterranean Region.

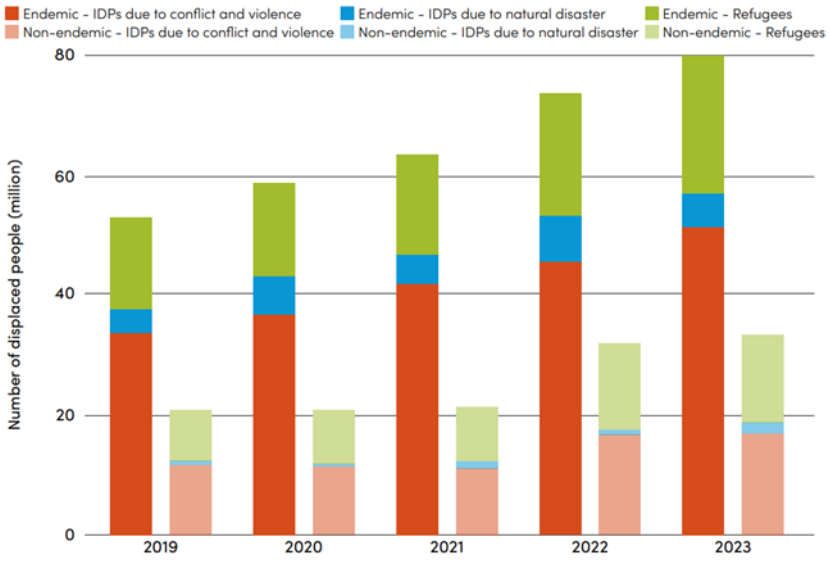
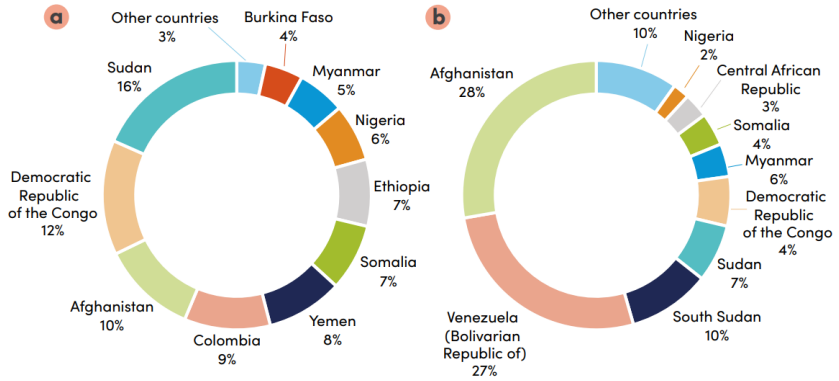


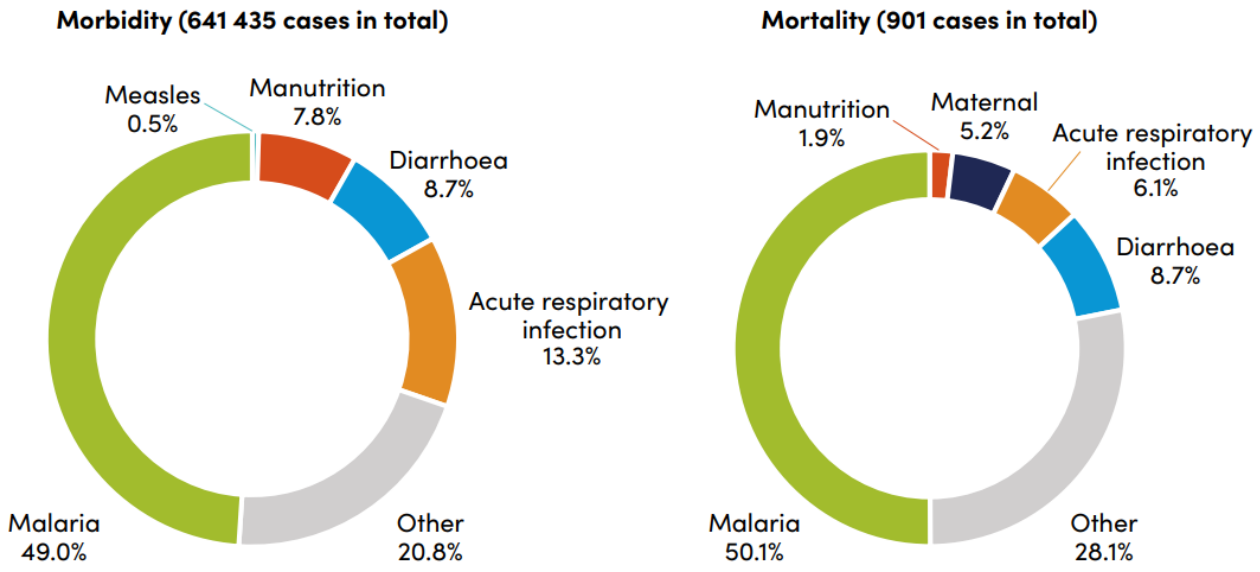
Fig. 7. Proportions of a) IDPs due to humanitarian emergencies in malaria endemic countries and b) refugees from malaria endemic countries, 2023



Malaria is leading cause of morbidity and mortality in endemic countries experiencing humanitarian crisis (~50% in Borno state, Nigeria)

Fig. 8 shows the causes of morbidity and mortality during the humanitarian emergency in Borno State, Nigeria. Fig. 9 presents the odds ratio for mortality from all causes by weight for height for children aged under 5 years.

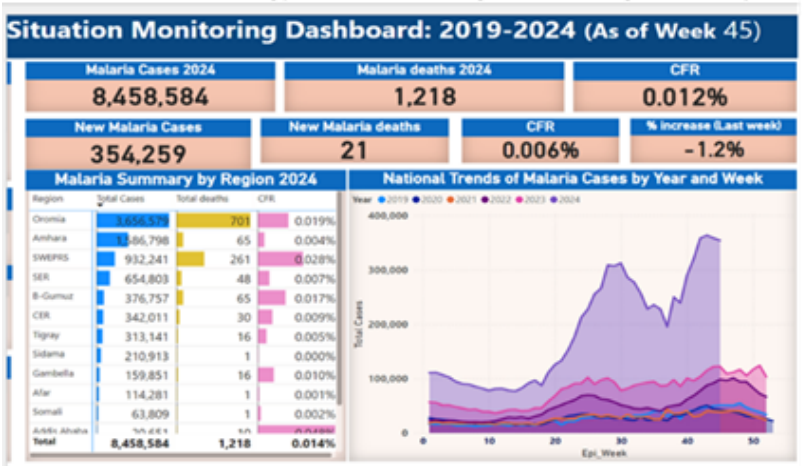
Fig. 8. Cross sectional survey on all causes of morbidity and mortality (10–16 October 2016), humanitarian emergency in Borno State, Nigeria



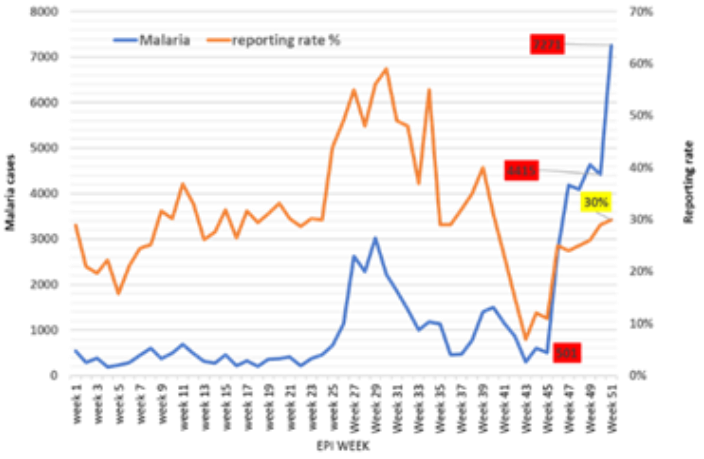
Source: adapted from UNHCR , 2016 *(29)*

Example: Malaria epidemics driven by conflict (2023/24)

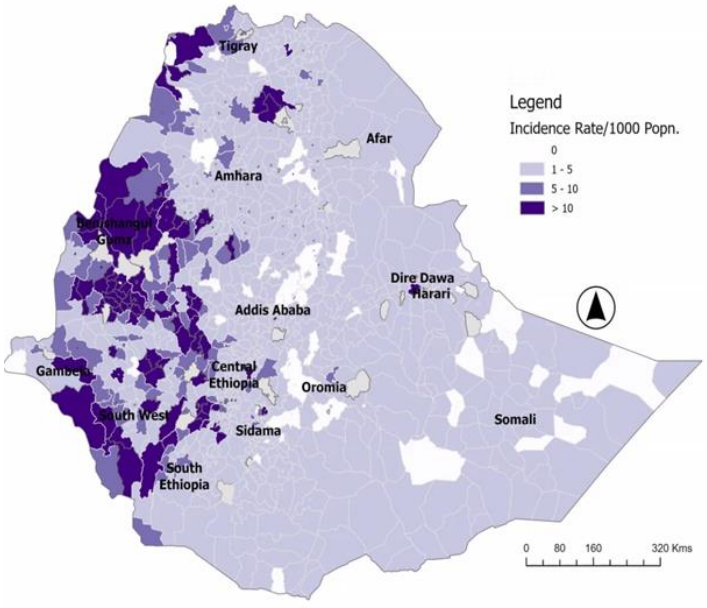
National monitoring 2024

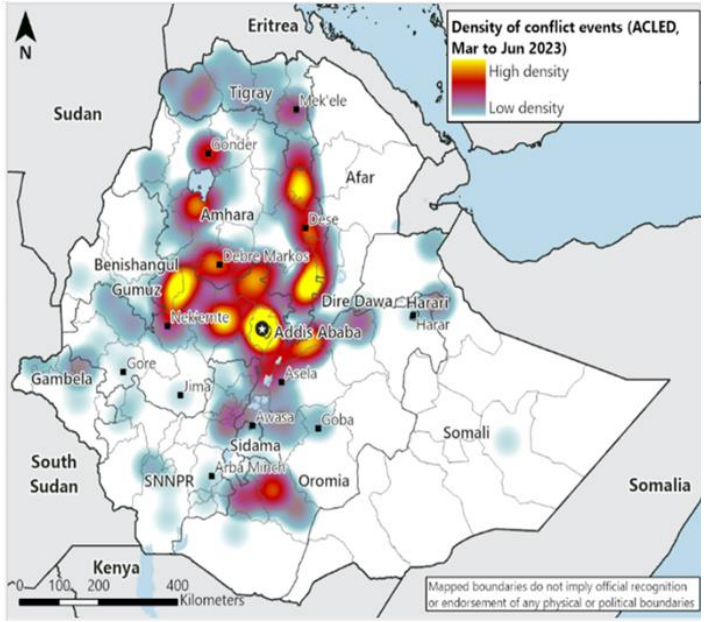


Tigray region



- Reporting facilities (30%) are ONLY from the less malarious and historically non-malarious districts in East, South-East and Mekelle zones.
- Exceptionally, the epidemic is on upward trend even during **JANUARY** where we expected decline.





Integration of malaria in Humanitarian Response

Align with Health Cluster & Refugee Response Plans

Embed malaria in WASH, shelter, nutrition

Coordinate with UNHCR, UNICEF, OCHA & NGOs

Financing & Logistics

- FUNDING SOURCES: GLOBAL FUND, BILATERAL, CERF, WHO CFE

- CHALLENGES: DELAYS, INAPPROPRIATE DONATIONS, WEAK SUPPLY CHAINS

- SOLUTIONS: INTERAGENCY POOLING, CONTINGENCY SUPPLIES, LOGISTICS CLUSTERS

Innovations & Research

- Vaccines: RTS,S and R21and feasibility of integration in protracted settings
- An. stephensi response: urban/adaptive strategies
- Operational research priorities: diagnostics, treatment, vector tools

special repellants

Key Messages for MPAG

- Malaria remains a leading killer in emergencies in endemic countries (specially among children under 5)

- Early, integrated malaria response saves lives

- Coordinated guidance needed on:

- Scaling innovations	- Cross-sectoral integration with humanitarian response	- Flexible, rapid financing

3. Conclusion and Recommendations for consideration

Conclusion

Malaria control is at tipping point – funding cuts, weak systems, conflict and climate-related crises

Without urgent action, progress toward GTS targets will reverse

Need decisive response to prevent collapse and protect vulnerable populations

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Recommendations for MPAG

Strengthen	Revise	Create
For Member States: -Strengthen surveillance to weekly monitoring -Institutionalize grading, -Fast track emergency policies, -Mandate co-financing from extractive sectors -Community brigades	**For WHO:** -Revise IDSR, -Integrate malaria into WHE grading, -Contingency planning for regional and global appeal	**For Donors:** -Create emergency financing window, -Dual-track financing (routine and epidemics/emergency)

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Subnational tailoring of malaria interventions and strategies manual

Dr. Arnaud Le Menach, Unit Head

Global Malaria and NTD Programme

MPAG, October 2025

For advice

World Health Organization

Content

1. Introduction to Sub-National Tailoring concept
2. From formulation to publication - SNT manual update
3. Applying SNT approach in country
4. Gaps and needs for country uptake

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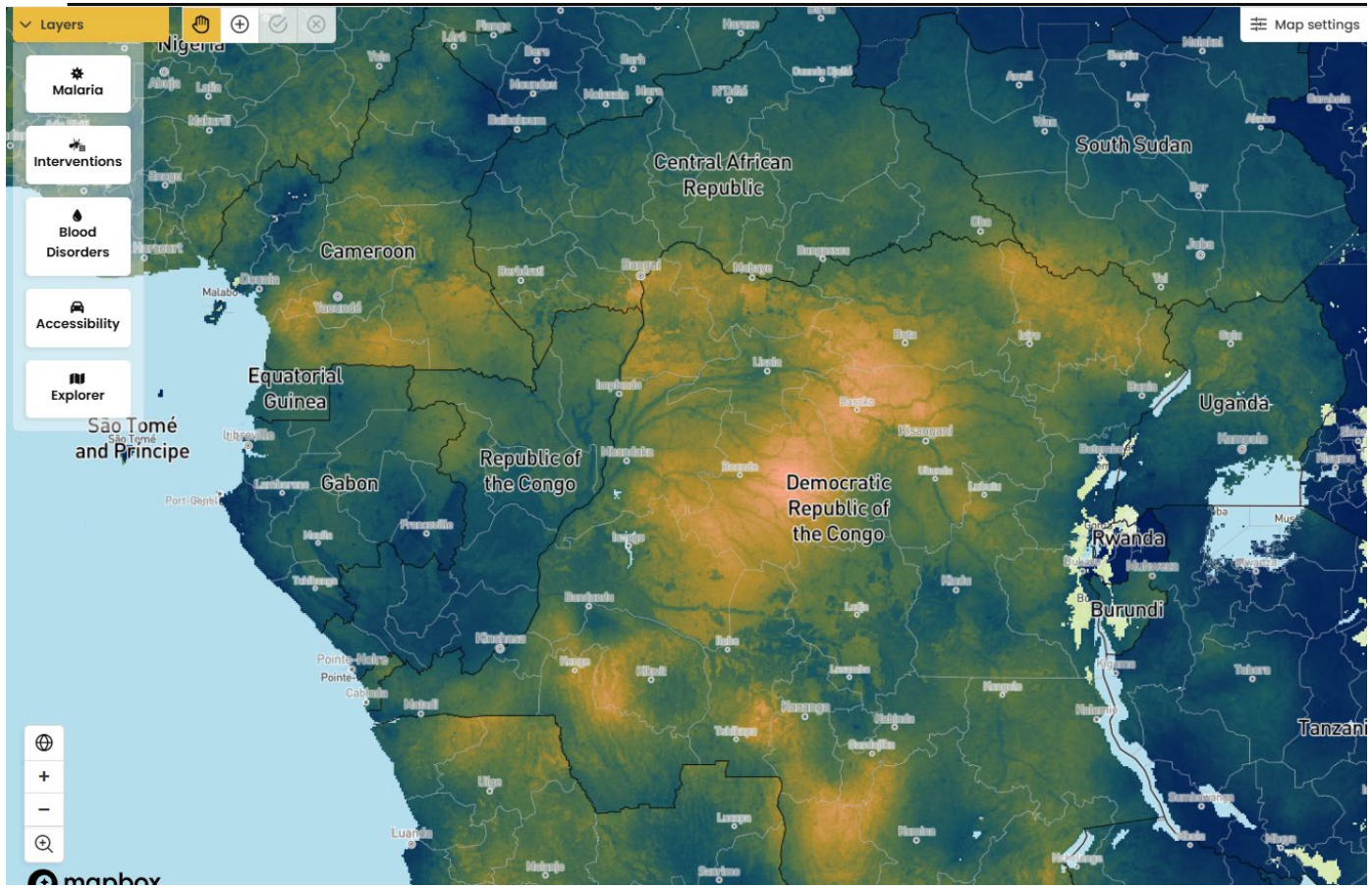
Malaria transmission varies temporally and geographically, even within high-burden countries

- Implementing the same interventions everywhere will result in a **sub-optimal use of resources**
- **Use of data at the sub-national** level required to ensure interventions are targeted to the right people in the right places at the right time for maximum impact
- Even more relevant with recent **USG funding disruption** and reduced funding availability.



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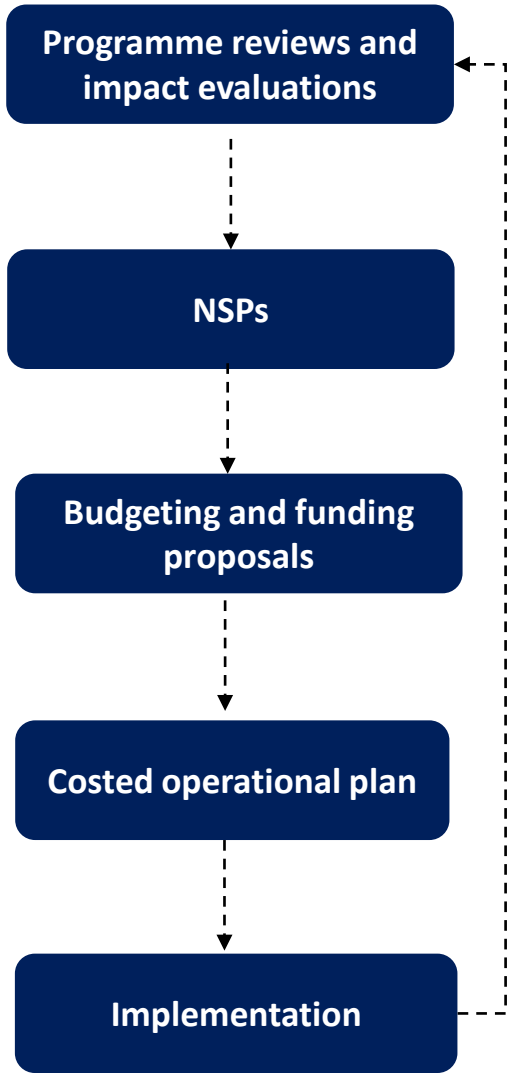
Use of data at subnational level required throughout the malaria program planning and implementation cycle



How do we design systems to monitor impact, and what is the impact of interventions?

What interventions should be used for impact? Where and for whom?

How much does it cost?

What interventions can we afford, Where and for whom?

How and when should interventions be implemented?

Subnational tailoring of malaria interventions (SNT) - the use of local data and contextual information to determine the appropriate mixes of interventions and strategies, for a given area, for maximum impact on transmission and burden of disease

Malaria SNT Conceptual framework

- SNT approach is not a stand-alone process but should be **integrated** within malaria planning and implementation processes

- **Ten steps** describe the process of implementing SNT, starting from planning, data collection, and analysis, to stratifying and modeling the impact of defined and prioritized scenarios in the NSP, before selecting the most cost-effective plans that fit the available budget in the operational plan

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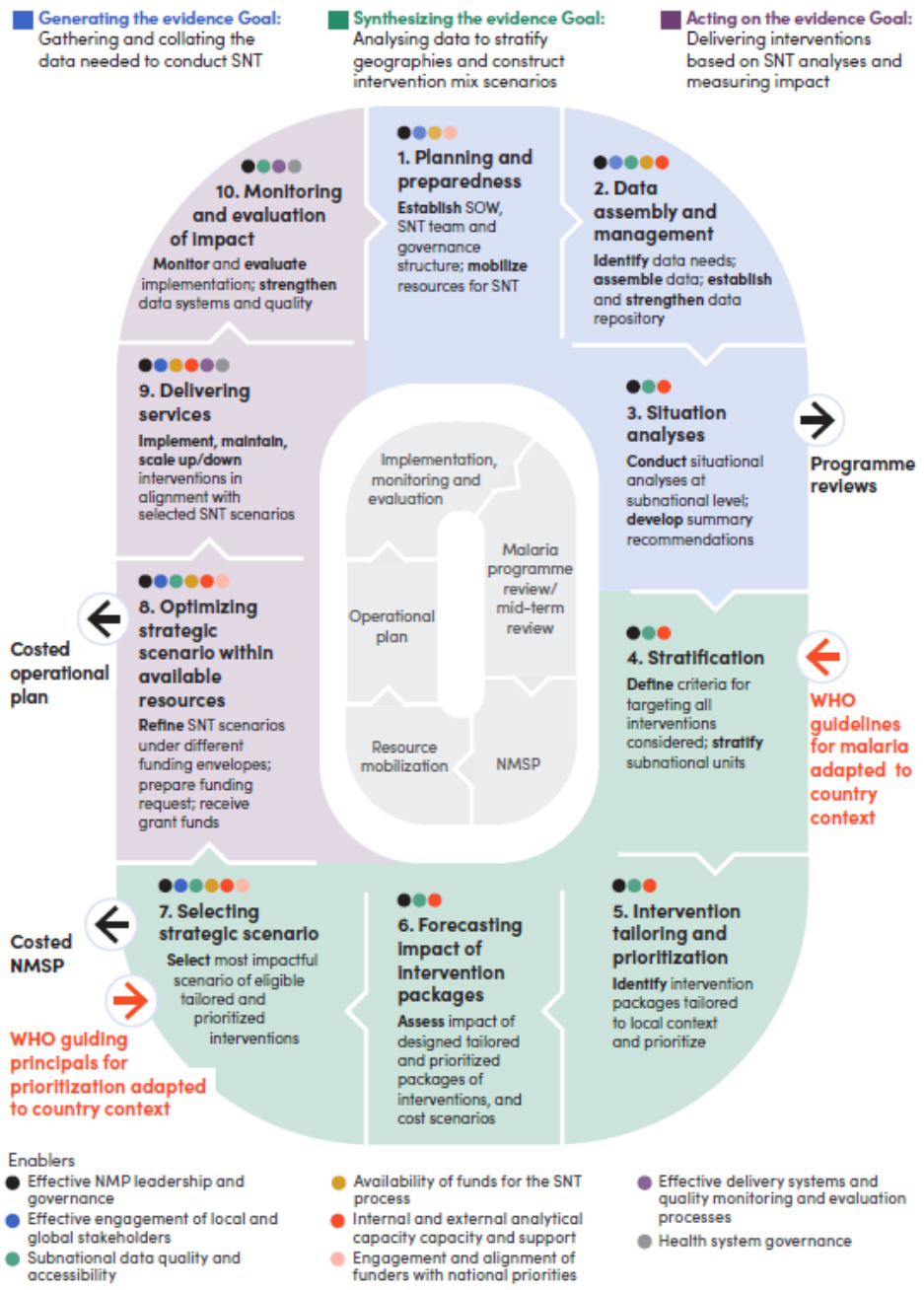
Fig. 5. SNT implementation steps, and integration within the malaria strategic planning and implementation cycle



NMP: national malaria programme; NMSP: national malaria strategic plan; SNT: subnational tailoring; SOW: scope of work.
This figure was inspired by Exemplars in Global Health (https://www.exemplars.health/topics/malaria).

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Scope and audience of the manual

Scope of the manual

- Describe **the use of subnational data** including analytical approach to address key questions* and inform processes and deliverables (e.g. MPR, NSP, Operational plan) during the **malaria planning and implementation cycle**
- Does not describe how to conduct a malaria program review or formulate an NSP or operational plan
- Does not prescribe which interventions to use where
  - Complementary to the "*Malaria Multi-Model Comparison of Priority Interventions*" that will **inform** global guidance on interventions prioritization, and can be **considered** by countries if relevant during SNT process

User of the manual

- **National malaria programmes** and their **implementation partners**
- **Subnational entities**, especially in devolved governance and decision-making systems, responsible for coordination of implementation activities and engagement with communities on health priority setting
- **Technical experts** supporting countries in subnational tailoring of interventions
- **Funders**

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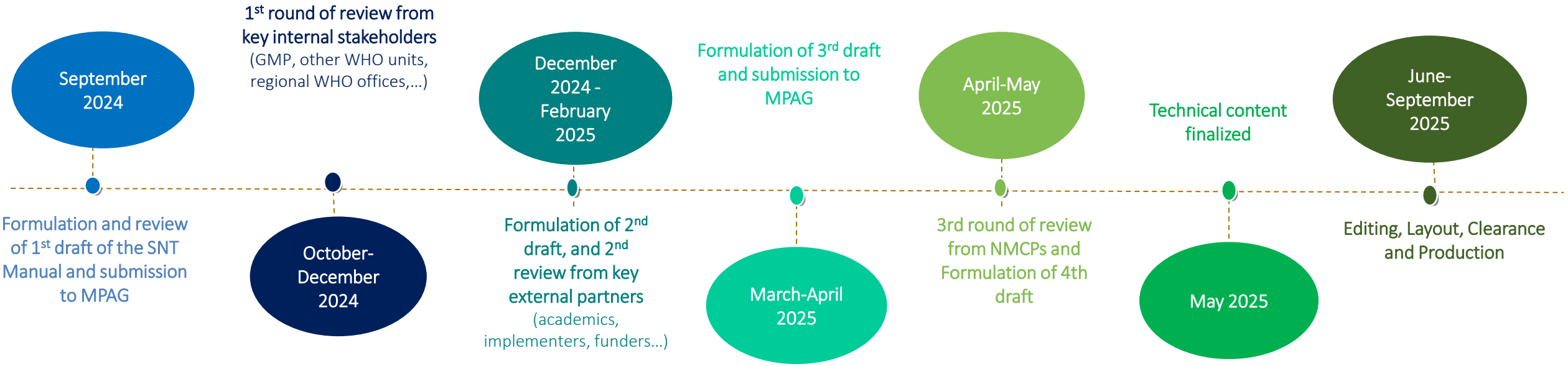
** Where do we intervene? Which interventions (or strategies) should we use? Which interventions can we afford and how do we prioritize? How and when do we deliver them? How do we design systems to monitor their impact?*

Timelines of the development and production of the SNT manual



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*6-8 weeks for editing, layout and publication

Internal and external reviews to ensure the manual relevance to the various end-users

Manual shared with

- WHO
  - GMP
  - WHO other technical units: Monitoring, forecasting and inequities, Health planning, Health financing, Health services performance assessment, Clinical services and systems, Vaccine, and Maternal, newborn, child and adolescent health
  - WHO regional offices
- MPAG-Members
- Donors: BMGF, GF, PMI*
- Implementing partners: CHAI, AHADI, PSI, PATH, MC, RBM
- Academic & research: STPH, Northwestern, IDM, MAP, KEMRI, IHI
- National Malaria Program: Burkina Faso, Sierra Leone, Ghana, Cameroon, Nigeria, and Mozambique

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*Not able to review

Consolidated feedback – structure and technical

Improve usability of the manual	Provide practical tools	Support capacity & leadership	Strengthen integration & prioritization
Feedback: Improve navigation, clarify terms, streamline text	*Feedback:* Add guidance on indicators, data quality, modelling, checklists	*Feedback:* Specify local leadership and analytical needs	*Feedback:* Link SNT with NMSP cycle, add practical prioritization guidance, clarify methods
• Added "How to Use the Manual" section • Developed step-by-step SNT framework • Added glossary (aligned with WHO Malaria Terminology 2021) • Streamlined text (moved details to Annexes) & summary tables • Improved readability of charts • Added references for further reading	• Added key metrics table and data sources table (in Annex) • Expanded data management section (e.g. quality, age-disaggregation) • Included approaches to handle uncertainty (e.g. model comparison) • Added SNT M&E checklist and SNT team TOR in Annex	• Added capacity building section on data management & analytics • Included references for additional resources and training materials	• Mapped SNT process alongside NSP with timelines • Included examples (e.g. Guinea) & theoretical country example • Expanded references on IPT, resistance data, IRS/ITN targeting • Glossary & reformulated cost-effectiveness chapter

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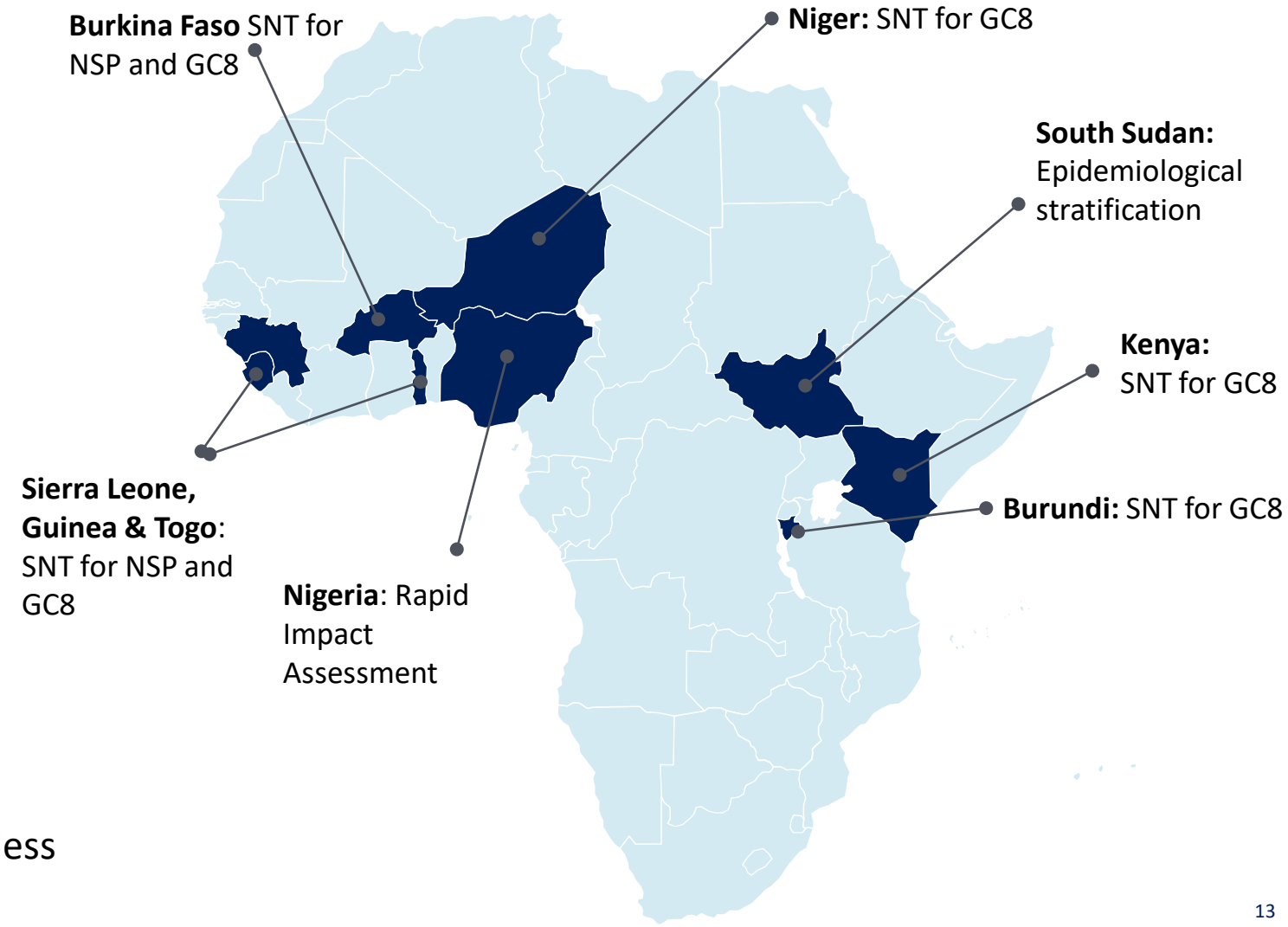
Direct support provided by WHO in 2025 in SSA

Country support Q1-Q2 of 2025:

- In house capacities for SNT implementation support to countries has drastically reduced.
- WHO still provides active support to countries that request it through the WCOs and regions, in collaboration with partners.
- In 2025, WHO received requests from 10 countries to coordinate SNT exercises to inform the development of new NSPs, the GC8 GF funding request, or both.



Moving forward – WHO will monitor the implementation of SNT in all countries regardless of direct support

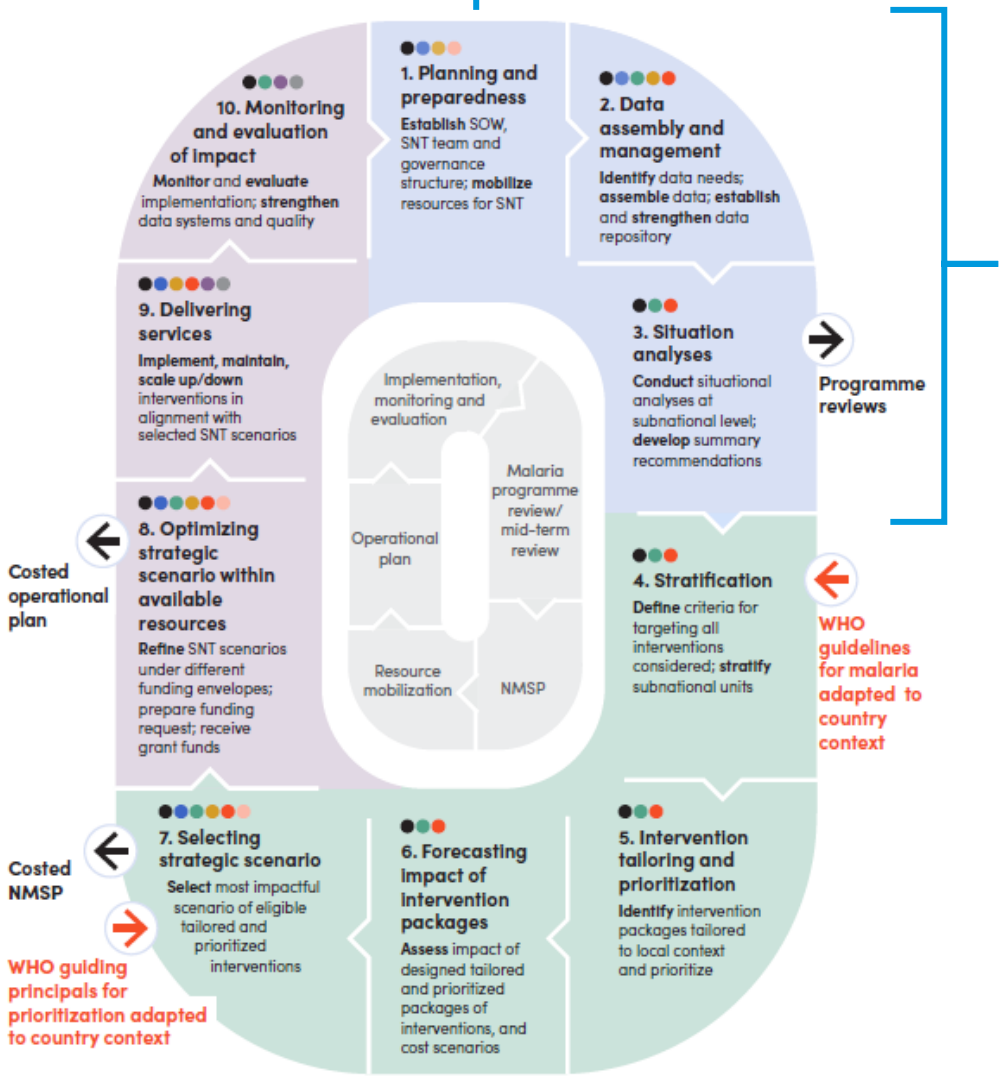
Example of country application: Sierra Leone

	Approach	Objective	Outcome	Output
Oct-Dec 2022	WHO-GAVI malaria vaccine targetting workshop	Malaria vaccine targeting and prioritization	Areas eligible and prioritized for the vaccine identified in light of limited RTS's doses and the increased availability of R21 vaccines.	GAVI application submitted and reviewed
Sept 2023	WHO incidence estimation workshop (Benin)	Country-led estimation of incidence at subnational-level	NMCP and partners trained in epidemiological stratification and SNT	Formal request to WHO for support to conduct a full SNT exercise prior to the review of GC7 and GC8
Oct-Dec 2023	WHO-facilitated SNT exercise	Targeting of school-based ITN distributions(SBDs) planned under GC7	Priority areas in need of SBDs identified and submitted to the GF	GC7 microplan for SBDs updated
Jan-July 2024	WHO-facilitated SNT exercise	Data collection, management and stratification of risk and its determinants	Databases structured until 2023, maps and analytical outputs validated	Stratification report submitted to the NMCP
Mar-Dec 2025	**WHO and partner-facilitated SNT exercise**	**Formulation of NSP and application to GC8**	**Stratification updated, interventions targeted *Ongoing*: Intervention prioritization, budgeting and optimization**	**SNT-v1 report submitted to the NMCP (Steps 1-5) - *Ongoing*: SNT-v2 with the complete process**

Example of country application: Sierra Leone's ongoing SNT work

NMCP:
- ✓ Establishes objectives,
- ✓ States deadlines,
- ✓ Oversees the entire SNT process,
- ✓ Reviews and reaches consensus regarding intervention criteria and scenarios of intervention mixes
- ✓ Links the process to local and funding-specific decision-making processes

SNT team: Meets weekly or twice a week
- ✓ NMCP
- ✓ WHO
- ✓ Local analyst (then hired by NU)
- ✓ CHAI
- ✓ Northwestern University
- ✓ Imperial College
- ✓ Local experts *ad-hoc* as needed



- ✓ Conducted in 2024 and updated in 2025 to add one year of routine data.
- ✓ Thorough review and validation of all databases and understanding of subnational malaria and its determinants
- ✓ Collaboration of partners with different skills
- ✓ Local analyst hired by WCO and then update by one of the partners to ensure continuity of the analysis

Sierra Leone: Intervention targeting to inform the NSP

1. INTERVENTION TAILORING

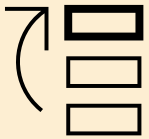
What needs to be done, where, when and for whom?

Output: One "ideal" scenario interventions following that encompasses all eligible WHO recommendations, tailored to the local context

2. PRIORITIZATION:

The ranking of objectives, activities, and interventions based on criteria such as importance, urgency, and impact.

- *Per intervention*
- *Between interventions*
- *Cross-cutting*



Output: A few implementation scenarios with prioritized packages of interventions

Lead: NMCP
Analysis partners:
- Coordination: WHO
- Stratification: WHO, CHAI, NU
- Math modeling: Imperial College

Forecasting impact of different costed intervention package scenarios to inform the NMSP

NSP

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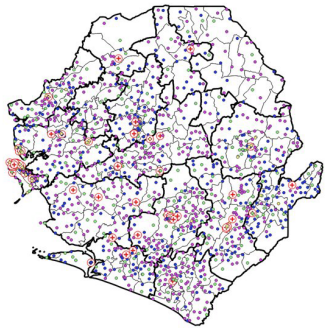
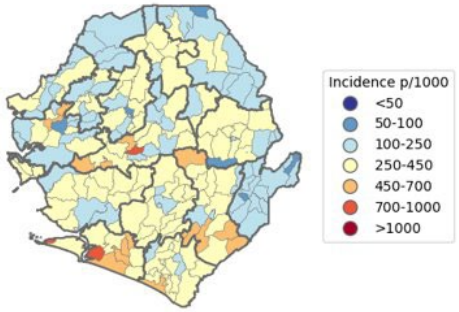
- ✓ An NMCP with an ideal and prioritized plans allows the NMCP to lay **the foundation for optimizing resources** and maximizing health outcomes in later stages.
- ✓ A **costed NMSP enables Sierra Leone to advocate effectively with donors and partners**, and ensure transparency and accountability, enhancing the impact and sustainability of malaria control and elimination efforts.

Example: Sierra Leone epidemiological and transmission determinants stratification

HF locations

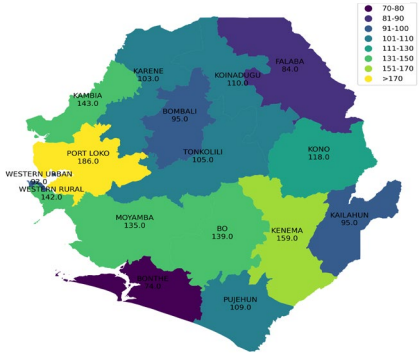


Incidence

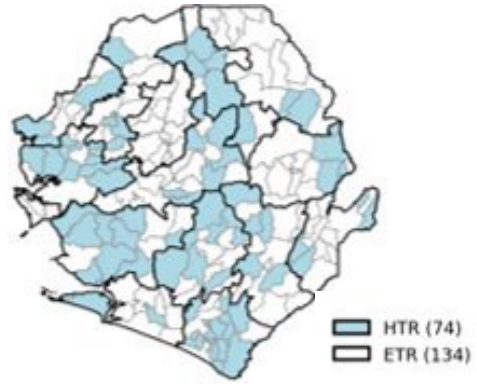


Prevalence

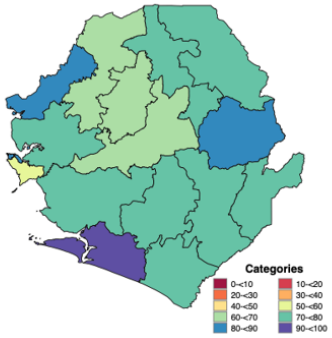
All-cause U5 mortality



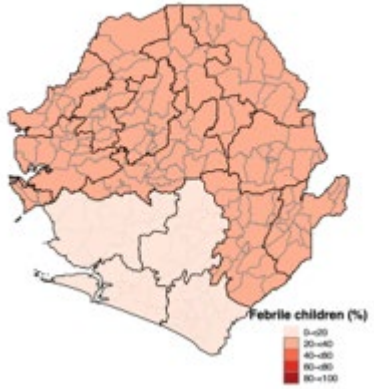
Hard-to-reach areas



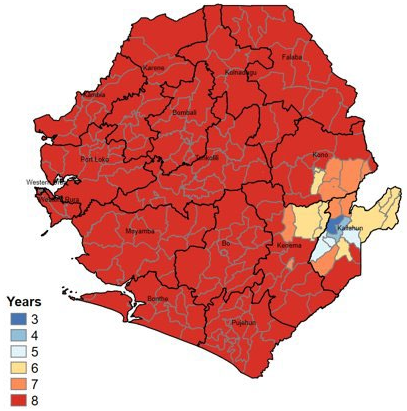
% children seeking care



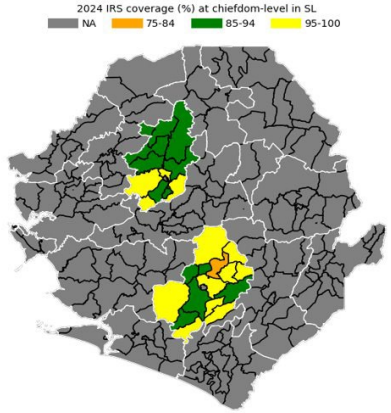
Non-care seeking behavior



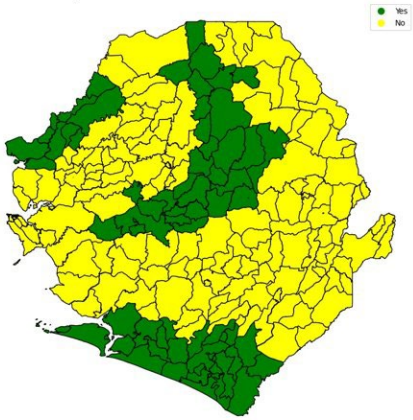
Years with SMC-eligible rainfall peaks



IRS coverage



SBD expansion areas



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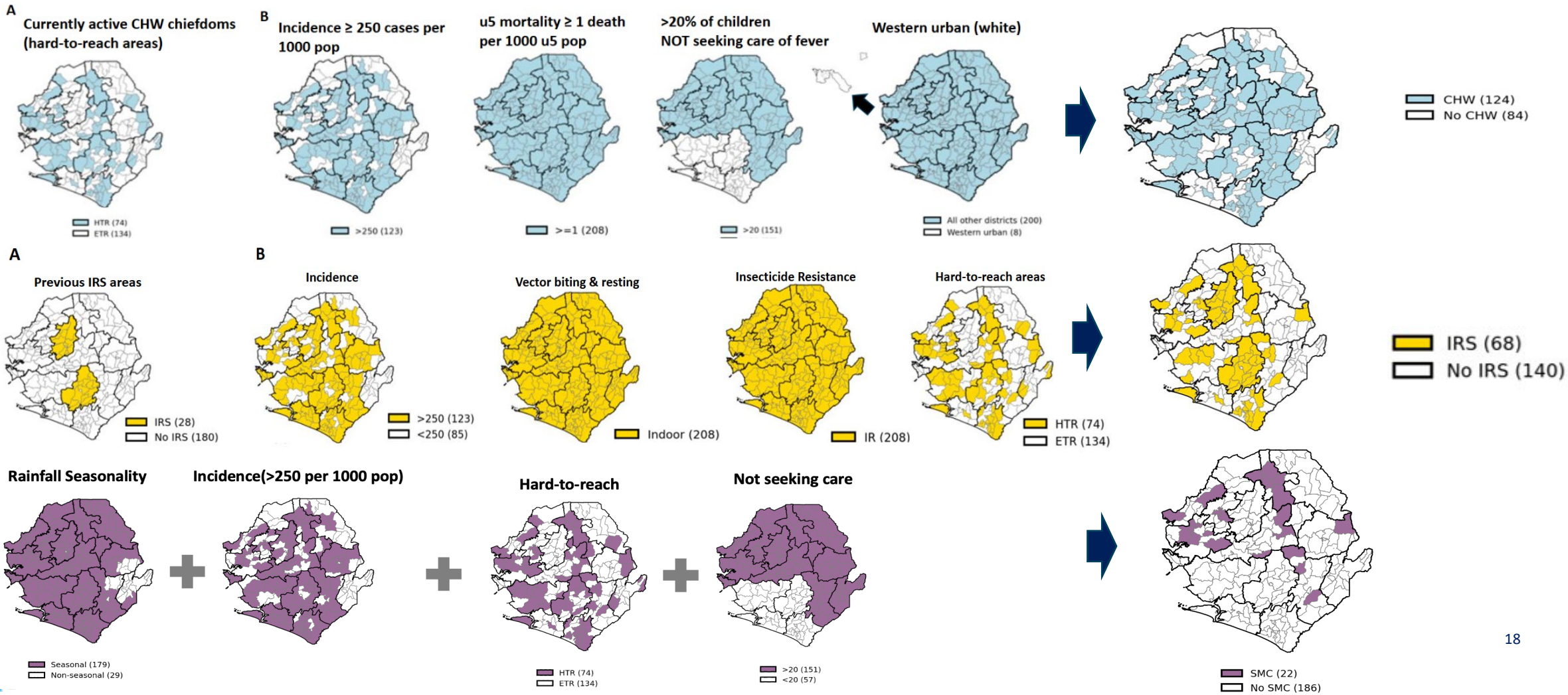
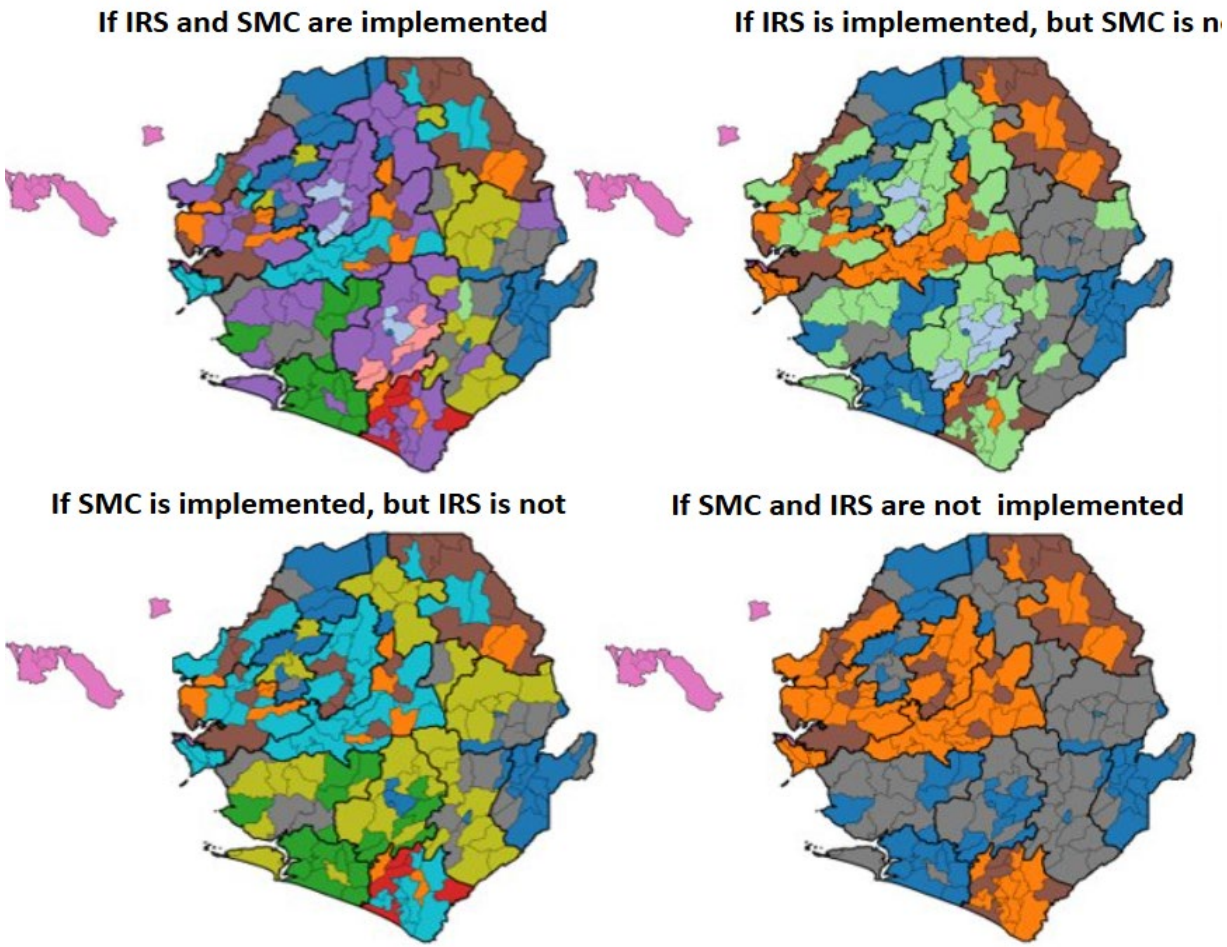
>100 maps produced and reviewed

Sierra Leone: Intervention targeting to inform the NSP



Sierra Leone: Intervention targeting to inform the NSP

Four «ideal» scenarios identified in the case that IRS and SMC are or are not implemented



Sierra Leone: Intervention targeting to inform the NSP

✓ Analysis conducted ➢ Analysis ongoing

Questions to inform the impact of different NSP scenarios:

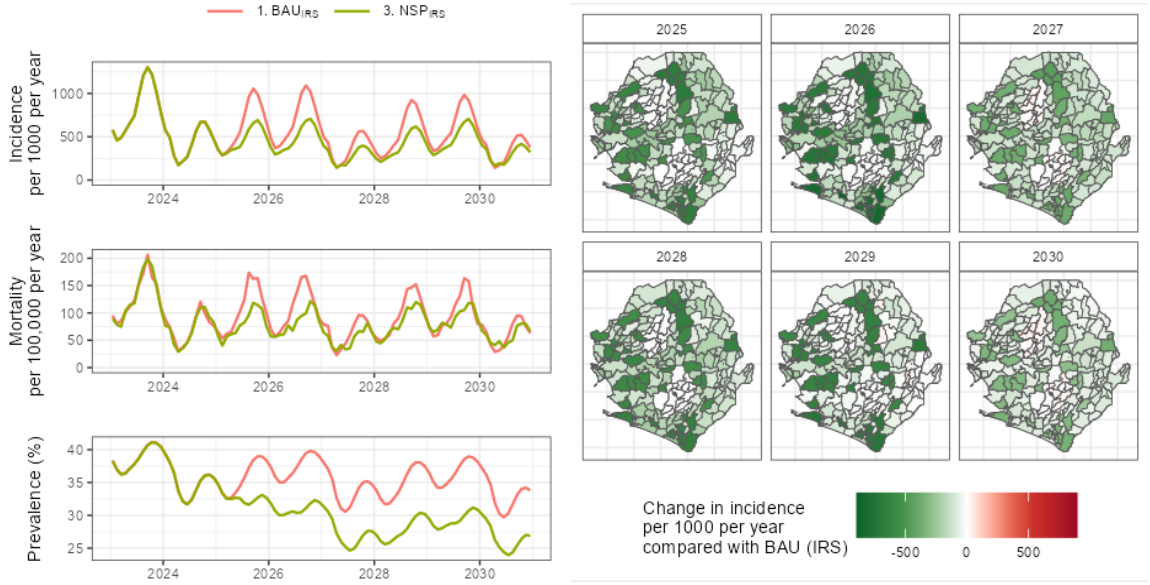
1. What is the impact of the NSP scenario with IRS and SMC in all eligible areas, compared to the BAU scenario?
2. What is the impact of the NSP without IRS compared to BAU with and without IRS?
3. What is the impact of the CHW expansion if all interventions continue as BAU?
4. What is the impact of removing IRS and continuing only with mass campaigns nationally, and in Bo and Bombali, if all other interventions continue as usual?
5. Can IG2 nets and SBD mitigate the negative impact of removing IRS that might be seen in Bo and Bombali?
6. What is the impact of switching from PBO to IG2 ITNs while continuing all interventions as BAU without IRS?
7. What is the impact of switching from PBOs to IG2 ITNs and implementing SBD while continuing all interventions as BAU without IRS?
8. What is the impact of implementing 4 rounds of SMC in eligible regions in the 0-5 year age group while continuing all other interventions as BAU without IRS?
9. What is the impact of implementing the pilot SMC in targeted regions?

Prioritization questions raised through the NSP development process:

1. Which areas to prioritize for CHW expansion among the 50 additional chiefdoms identifies?
2. Which IRS-eligible areas should be prioritized?
3. What will be the malaria control strategy for Western Areas (Freetown)?
4. In the event that mass campaigns need to be prioritized, how should determine the prioritization ranking?
5. Where could SBDs have the most impact among areas where mass campaigns scaled back?
6. What strategies can be used to boost the coverage of routine ITN campaigns?
7. Prioritization of SMC eligible areas in light of operationability and other factors.
8. What is the impact of switching from PMC to SMC ?
9. What are the SMC cycles that would be needed among eligible areas?

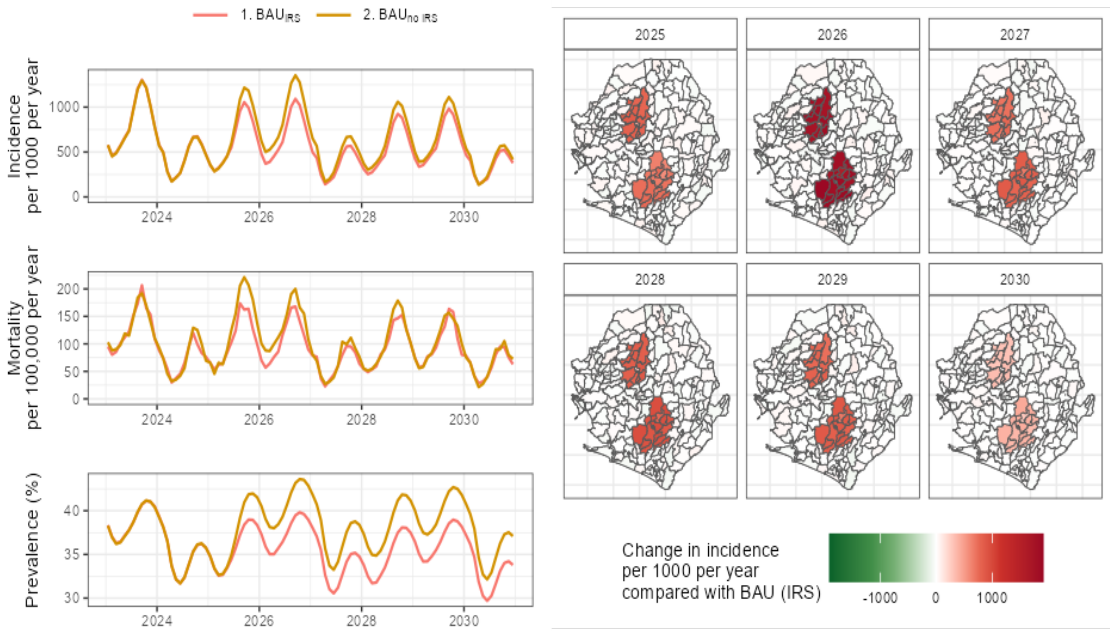
Sierra Leone: Use of mathematical modeling

What is the impact of the NSP scenario with IRS and SMC in all eligible areas, compared to the BAU scenario?



National impact: 26.0% reduction of clinical incidence and 17.5% reduction in mortality over 2025-2030

What is the impact of removing IRS and continuing only with mass campaigns nationally?

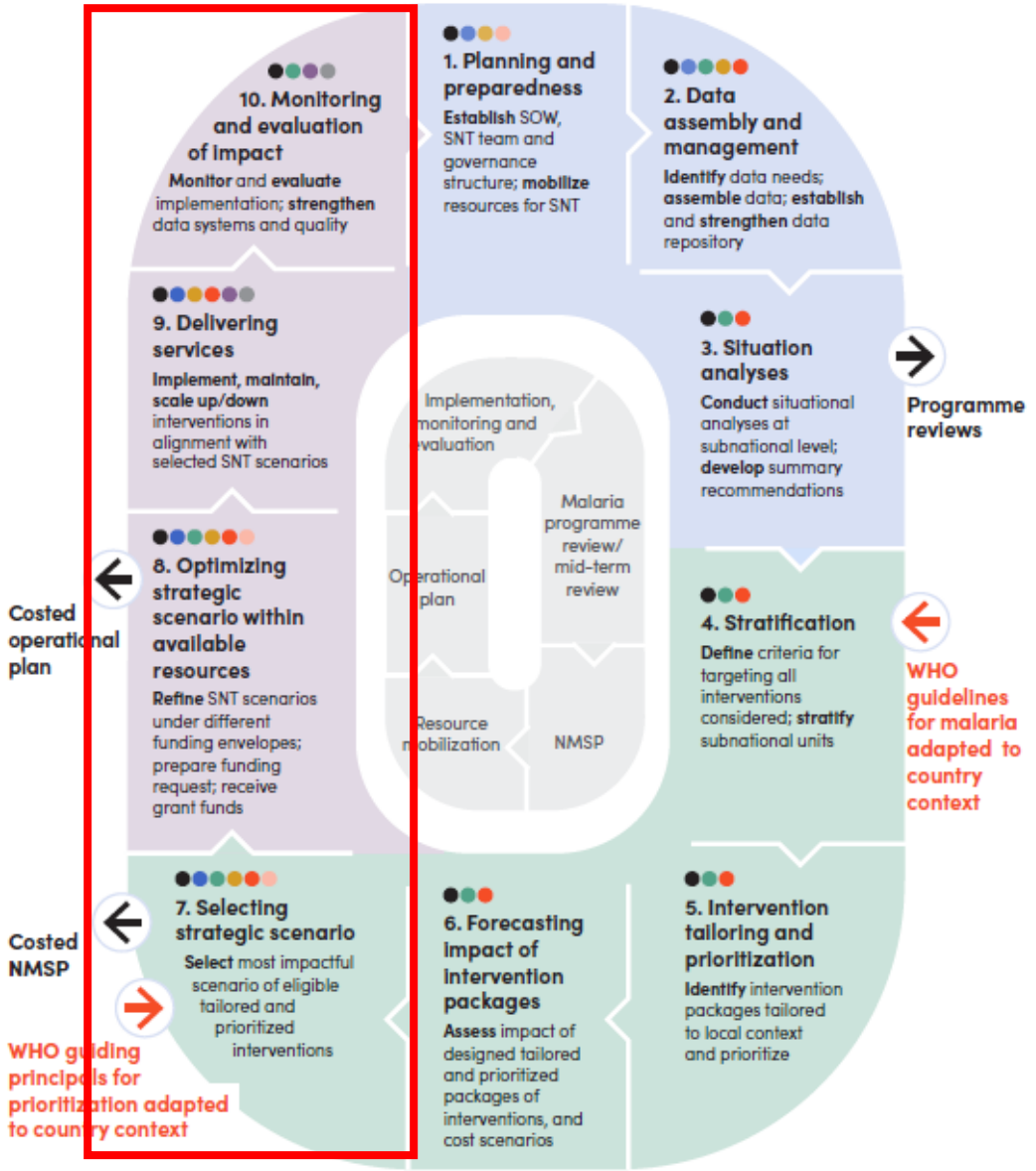


Bo and Bombali: 237.6% increase in clinical incidence and 125.4% mortality over 2025-2030

World Health Organization

Example of country application: Sierra Leone – Next steps

- Finalize the prioritization scenarios (August 2025)
- Engage relevant stakeholders in the SNT exercise: other departments in the MoH, subnational level, and relevant partners
- Include the SNT work within the malaria program review (Sept-Dec 2025)
- Decide which final ideal and prioritized scenarios go into the NSP (Sept-Dec 2025)
- Optimize the NSP based on available resources once GC8 allocations are announced (February 2026)
- Plans to deliver, monitor, evaluate and measure impact (mid-2026)



World Health Organization

Content

1. Introduction to Sub-National Tailoring concept
2. From formulation to publication - SNT manual update
3. Applying SNT approach in country
4. Gaps and needs for country uptake

World Health Organization

Qualitative assessment to understand NMCP's perspectives of the SNT processes implemented in 2019-2021 and 2022-2023

- **Objectives:**
  - **Understand NMCPs' perspectives** on the SNT process, their role, and their sense of ownership.
  - Understand **barriers and enabling factors** to the use of SNT outputs for decision-making
  - Understand NMCPs' **future plans for SNT**, including confidence in carrying out SNT on their own, continued use of existing outputs, and plans for capacity development
  - Gather NMCP **recommendations for improving the process and utility** of SNT
- **Design:** Qualitative assessment through semi-structured interviews
- **Target population:** NMCP members of countries that had undergone an SNT exercise between September 2022 and July 2023 with technical support from WHO and had implemented all analysis steps of SNT
- **Study participants:** 12 participants interviewed (two or three representatives per NMCP), from **Burkina Faso, Ghana, Guinea, Nigeria, and Togo**.
- **Data collection and analysis:** Interviews were carried out, transcribed and analyzed between June and December 2023 (after GC7 submissions).

PLOS Global Public Health

RESEARCH ARTICLE

Subnational tailoring of malaria interventions for strategic planning and prioritization: Experience and perspectives of five malaria programs

Letitia Onyango[1], Ghislaine Ouédraogo-Ametchie[1], Ifeoma Ozodiegwu[1,2¤], Beatriz Galatas[3], Jaline Gerardin[1*]

1 Institute for Global Health and Department of Preventive Medicine, Northwestern University Feinberg School of Medicine, Chicago, Illinois, United States of America, 2 Department of Health Informatics and Data Science, Loyola University Parkinson School of Health Sciences and Public Health, Chicago, Illinois, United States of America, 3 Global Malaria Programme, World Health Organization, Geneva, Switzerland

¤ Current Address: Department of Health Informatics and Data Science, Loyola University Parkinson School of Health Sciences and Public Health, Chicago, Illinois, United States of America
* jgerardin@northwestern.edu

https://journals.plos.org/globalpublichealth/article?id=10.1371/journal.pgph.0003811

WHO-IRB approved on the 13th March 2022

Key takeaways

NMCP's key perspectives on SNT

- SNT is a **highly accepted and valuable tool** for NMPs, enabling evidence-informed decision-making, strategic planning, and resource mobilization in resource-constrained contexts.
- SNT was a **catalyst for improving data** quality and fostering a culture of data use within NMPs, driving them to address surveillance and data management challenges.
- NMPs have **a strong sense of ownership** and desire for increased autonomy in the SNT process.
- This **ownership grows through active** participation and iterative engagement.
- Effective **partnerships** with NMPs are country-driven and prioritize **trust-building** through open communication and adaptability.
- Systematic and early **engagement of subnational partners is critical** for data quality improvement, local buy-in, and successful implementation of tailored interventions.

Consequences of SNT: Next steps in participating countries

- **Continued use and expansion of SNT:**
  - All NMPs expressed explicit plans to continue using and expanding SNT and a strong desire to extend SNT to more granular geographical levels.
- **New resource mobilization approaches:**
  - Following successful use with the Global Fund, NMPs are actively exploring how to reuse SNT outputs to secure funding from other donors, particularly the private sector.
- **Data quality improvement & subnational engagement:**
  - NMPs detailed extensive plans for improvements in data management and quality, including better documentation and centralized data repositories.
  - NMPs emphasized the need for systematic engagement of subnational offices and health facilities from the very beginning of the SNT process to address data quality and improve acceptability of outputs.
- **Expand capacity for independent SNT analyses:**
  - Most NMPs are highly confident in conducting stratification independently but still required support for some aspects of stratification and mathematical modeling.

World Health Organization

For advice from MPAG members

What is needed to ensure a sustainable model for SNT uptake by countries and how to implement it (resources and timelines)?

Strengthen program and relevant local partners capacity building

- Specific SNT training sessions, workshops
- Strengthening local capacities through enriched university curricula in data science
- Formulating and disseminating relevant training material

Improve health information systems and data quality

- Continue support to establishment and expansion of NMDRs
- Measure performance of surveillance systems and quality of data and identify areas to be strengthened

Promote the formulation and translation of global guidance at national level

- Include in NSP the importance of using local data for decision-making
- Monitoring the use of SNT, identifying and addressing gaps at global, regional and national level (establish a monitoring system)

Governance

- Global funders and partners to align and support local-level SNT activities and consequent decisions
- Countries to establish governance mechanisms to engage subnational stakeholders

Malaria Policy Advisory Group Meeting
Virtual meeting, 14–16 October 2025 (13:00-17:00 GMT+1)
Background document for Session 4

Update on development of WHO guidelines for malaria

Drs A. Bosman, L. Carrington, J. Cunningham, R. Okine, P. Olumese

The WHO guidelines for malaria bring together the Organization's most up-to-date recommendations for malaria in one user-friendly and easy-to-navigate online platform, also available in PDF version. The guidelines are also available in Arabic, French and Spanish on MAGICapp.

Since 2021 WHO has consolidated the guidelines into a single document, replacing two separate WHO guidelines available up to that time: i) the Guidelines for the treatment of malaria (3rd edition) and ii) the Guidelines for malaria vector control.

The consolidated WHO guidelines for malaria include four different sections: 1) Prevention, which covers vector control, preventive chemotherapies and vaccines; 2) Case management; 3) Elimination and prevention of re-introduction, and 4) Surveillance. Except for the Surveillance section, the WHO Guidelines for Malaria are developed following the rigorous and transparent process of WHO guidelines development which is overseen centrally by WHO Department Science for Health. As new evidence becomes available, the recommendations are reviewed and updated where appropriate.

The consolidated WHO malaria guidelines have been updated 10 times since 2021 and the most recent update released on 13 August 2025, replaces the versions published on 16 February 2021, 13 July 2021, 18 February 2022, 31 March 2022, 3 June 2022, 25 November 2022, 14 March 2023, 16 October 2023 and 30 November 2024. The updated version of the Guidelines reflects revised information on WHO's recommendation for indoor residual spraying to prevent malaria. It incorporates evidence from two new insecticides (chlorfenapyr and isocycloseram), while maintaining the overall recommendation and emphasizing reduced use of DDT. It also adds a new recommendation for spatial emanators (spatial repellents) based on recent evidence.

Updating malaria vector control recommendations

The most recent update of the WHO guidelines for malaria released in August 2025 focused on vector control, and the next update is planned for publication in October 2026, with the Guidelines Development Group (GDG) meeting in March-April 2026.

The identified priorities include consolidation of the multiple existing recommendations on ITNs to guide choice of nets in different settings according to transmission and insecticide resistance and refine recommendations for single-, dual- and triple-active ingredient nets, as well as developing new recommendations for both for endectocides (ivermectin) and eave tubes. Building on the scoping review of contextual factors performed in 2022, a systematic review of qualitative evidence synthesis will be completed to cover a wide range of vector control interventions to inform deliberations of the future GDGs. In addition, the existing guidelines Good Practice Statements on malaria vector control will be reviewed and updated.

A. ITNs

The current recommendations relating to ITNs are numerous, and variable in scope. They vary based on how the evidence was generated and the comparators used in the trials. Given the complexities and challenges experienced by end-users on the interpretation of the current ITN recommendations, the

plan is to update and consolidate the evidence (based on 3 different systematic reviews) and perform a meta-analysis. The systematic review will also include the 3rd year trial data from the most recent dual-AI net trials generated by the NewNets project. The meta-analysis will assess ITN efficacy in relation to insecticide resistance, to develop ITN recommendations according to the resistance profile of the mosquito population.

B. Endectocides

WHO currently has no recommendation for ivermectin for use as a vector control intervention. The systematic review of the evidence conducted previously has been inconclusive. Data from a total of five trials is being analysed in a new systematic review, and this will inform the deliberations of the GDG at the next meeting.

C. Eave tubes

WHO currently has a recommendation for house screening, but this does not include eave tubes. The results of a second trial evaluating eave tubes (expected Q4 2025), and these will be included in a systematic review to inform a new recommendation on this intervention.

Timelines:

1. Guidelines Review Committee planning proposal submitted (June 2025)
2. Request for Proposals for LTA for systematic reviews opened (June 2025)
3. GRC planning proposal approved (July 2025)
4. LTA contract signed and APWs initiated (October 2025)
5. Systematic reviews
    a. Endectocides (December 2024-March 2026 - ongoing)
    b. ITN and eave tubes (October 2025-March 2026 – yet to start)
6. GDG meeting (in-person) to formulate recommendations (April 2026)
7. Drafting recommendations, external review and finalization (May-August 2026)
8. Submission and clearance by GRC (September 2026)
9. Publication of the recommendations (October 2026)

Updating malaria vaccine recommendations

Two malaria vaccines (RTS,S/AS01 and R21/Matrix-M) are currently recommended by the WHO for the prevention of *Plasmodium falciparum* malaria in children living in endemic areas, prioritizing areas of moderate to high transmission. A four-dose schedule is recommended from around 5 months of age. A fifth dose, given one year after dose 4, may be provided in areas of highly seasonal malaria transmission and can also be considered in other areas where malaria risk remains high. WHO recommends that malaria vaccines be provided as part of a comprehensive malaria control strategy. SAGE recommendations on malaria vaccines are included in WHO guidelines for malaria and these are updated as new data become available.

The SAGE-MPAG Working Group for malaria vaccines reviewed results of a case-control study recently completed in Ghana, Kenya and Malawi, designed to complement the results of the cluster-randomized MVIP evaluations. The RTS,S/AS01 case-control study was conducted between October 2021 and March 2025, based on the surveillance systems (network of sentinel hospitals and community mortality surveillance) established as part of the malaria vaccine pilot evaluation studies. The study objectives were to:

1. Measure estimates of safety and effectiveness at the individual level;

2. Assess the risk of severe malaria rebound following three doses (without a 4th dose); and
3. Establish the additional benefit of the fourth vaccine dose

Summary of the case-control study results:

- Severe malaria:
  - **56% reduction** among children receiving three doses during the period until the 4th dose was due
  - **35% reduction** among children who did not go on to receive the 4th dose, from the age when they were eligible for the 4th dose
  - **54% reduction** in those receiving four doses lasting at least 18 months after the 4th dose
  - **30% incremental effectiveness** of dose 4, compared to 3 doses
- Severe malaria rebound:
  - No risk of severe malaria rebound in children who received three doses (and not dose 4).
  - Evidence of sustained protection beyond the age when children were due to receive the 4th dose
- Safety
  - The results further strengthened the evidence of no association of RTS,S/AS01, and the safety signals reported in the Phase 3 clinical trial

Timelines

1. The RTS,S/AS01 case-control study safety results review by MVIP DSMB (May 2025)
2. SAGE/MPAG Working Group review of the RTS,S/AS01 case-control study results (July and August 2025)
3. Working Group's draft recommendations review by joint session of SAGE-MPAG (September 24, 2025) with full evidence report and other background documents available in the SAGE Yellow Book [https://terrance.who.int/mediacentre/data/sage/SAGE_eYB_Sep2025.pdf].
4. Presentation of SAGE-MPAG recommendations to DG for endorsement (September 2025)
5. Updating WHO guidelines for malaria in relation to malaria vaccines (December 2025I

Updating malaria diagnostics recommendations

The planned update of diagnostic section of the WHO guidelines for malaria will address diagnostic challenges posed by *Plasmodium knowlesi, P. malariae* and *P. ovale* spp which are endemic in various regions, each presenting unique public health challenges due to transmission dynamics, diagnostic complexity, and disease burden. *P. knowlesi* is primarily found in Southeast Asia, particularly in Malaysia, Indonesia, the Philippines, Thailand, and Myanmar, and in some areas is the leading cause of malaria morbidity and mortality. Although a zoonotic parasite infecting macaques, human cases have increased due to deforestation, changing land use and improved surveillance: the disease can progress rapidly, with high case fatality resembling *P. falciparum* malaria, and requires reliable diagnosis and urgent treatment.

P. malariae has a widespread and patchy distribution across sub-Saharan Africa, South America, and parts of Asia, with chronic infections often going undetected. While its prevalence is generally low compared to *P. falciparum* and *P. vivax*, recent molecular studies suggest it may be more common than previously thought. Chronic infections can persist for years, leading to complications such as nephrotic syndrome.

P. ovale spp comprising two species is mainly found in sub-Saharan Africa, West Africa in particular, as well as in parts of Southeast Asia and the Pacific Islands. Like *P. vivax*, it can cause relapsing infections but is often underdiagnosed due to its lower parasitemia and morphological similarities to *P. vivax*.

The burden of these species is often underestimated due to the limitations of standard diagnostic tools. Microscopy, a primary malaria diagnostic method used in many endemic settings, cannot differentiate *P. knowlesi* from *P. malariae* due to their similar morphological appearance, leading to frequent misdiagnosis. Rapid diagnostic tests (RDTs), which are widely used for diagnosis of *P. falciparum* and *P. vivax*, have been less well studied for detection of the other malaria species with reports suggesting lower sensitivity. Molecular tools like PCR and LAMP may provide the most reliable diagnosis but have not been widely commercialized and are not readily available in routine clinical settings, especially in low-resource areas. The lack of species-specific diagnostics has critical implications for case management, as *P. knowlesi* requires immediate detection and treatment, while *P. ovale* spp infections require anti-relapse treatment with primaquine or tafenoquine to clear dormant liver stages. Given these diagnostic challenges and the potential for severe or chronic disease, evidence-based recommendations for testing are essential to ensure accurate detection, appropriate treatment, and effective malaria surveillance. To this end, a set of PICO/PIRT questions have been developed by a newly established Guideline Development Group (GDG) who will formulate recommendations on *P. knowlesi* testing and use of RDTs for diagnosing *P. malariae* and *P. ovale* spp.

Timeline:

1. Planning proposal submitted and approved by GRC (July 2025)
2. GDG established and scoping meeting to set PICO/PIRT questions (May-July 2025)
3. Identification of systematic review group (August 2025)
4. Systematic reviews commissioned (September- February 2026)
5. GDG meeting to discuss minimally acceptable criteria (December 2025)
6. GDG meeting to formulate set of recommendations (March 2026)
7. Draft recommendations, external review and finalization (April 2026)
8. Submission to GRC and clearance (May 2026)
9. Publication of the recommendations (June 2026)

Updating malaria chemotherapy recommendations

In next update of the WHO guidelines for malaria, specific recommendations will be updated in relation to using single low dose primaquine to reduce antimalaria drug resistance in areas of moderate to high transmission and on intermittent preventive treatment of malaria in pregnancy. In addition, WHO will update recommendations on the treatment of young infants below 5 kg bw, based on the recent registration of a new paediatric formulation of artemether-lumefantrine. The rational for the proposed review and update is provided below:

A. Single low dose primaquine in areas of moderate to high transmission

WHO currently recommends a single dose of 0.25 mg/kg bw primaquine be given with an ACT in low-transmission areas and as part of a malaria elimination strategy, to patients with *P. falciparum* malaria (except pregnant women) to reduce malaria transmission. However, recent evidence has demonstrated efficacy and safety of this intervention also in children in settings with moderate to/ high transmission. The impact on both gametocyte carrier rate as well as on the infectivity of *P. falciparum* gametocytes to mosquitoes provides the evidence-base to consider the addition of single low-dose primaquine to ACTs for the treatment of uncomplicated malaria in areas of confirmed or suspected artemisinin resistance to limit the transmission of drug-resistant parasites in areas of moderate to high malaria transmission.

B. Intermittent preventive treatment of malaria in pregnancy in women living with HIV/AIDS

WHO currently recommends that pregnant women receive intermittent preventive treatment in pregnancy (IPTp) with sulphadoxine-pyrimethamine (SP), as a strategy to minimise the effect of malaria on the mother and the fetus. However, IPTp-SP is contraindicated in pregnant women living with HIV/AIDS receiving cotrimoxazole prophylaxis due to the risk of sulfonamide-induced adverse drug reactions. This is particularly of concern as there is considerable geographical overlap between malaria and HIV infection, and many people are co-infected especially in Sub-Saharan Africa, and worsening HIV-related immunosuppression may lead to more severe manifestations of malaria. Recent trials have evaluated the efficacy and safety of IPTp with dihydroartemisinin-piperaquine (DP) providing the evidence-base to consider monthly IPTp-DP for malaria in pregnancy in women living with HIV/AIDS.

C. Treatment of uncomplicated malaria in babies less than 5kg body weight

WHO currently recommends treating uncomplicated malaria in neonates and infants less than 5kg body weight with ACTs at the same dose regimen equivalent to babies weighing 5kg. With the development and registration of artemether-lumfantrine (1:12 ratio) specifically designed for infants of this body weight, the guidelines update will consider if babies <5kg body weight with uncomplicated malaria be treated with this new formulation of artemether-lumefantrine (2.5mg/30mg).

Timeline:

10. Planning proposal submitted and approved by the GRC (June 2025)
11. Systematic reviews along with collation and synthesis of evidence on-going
12. GDG remote meeting to formulate recommendations (18-20 November 2025)
13. Draft recommendations, external review and finalization of the recommendations (December 2025- April 2026)
14. Submission and clearance by GRC (May-June 2026)
15. Publication of the recommendations (July 2026).

Transitioning to WHO living guidelines

The current, standard WHO guideline development process utilizes traditional global best practice methods to ensure scientific rigor and transparency. However, guidelines routinely take years to develop, are often only updated at fixed, pre-specified schedules and thus can be slow to respond to new evidence that may lead to important changes in global policy or practice.

To address this problem, methods for keeping guidelines 'alive' and always up to date were put forward in 2017 and the term 'living guidelines' was coined. Core to the 'living' concept is ensuring that key recommendations within a guideline are kept as up to date as required and as feasible, with all relevant up-to-date evidence considered by the guideline developers. The process involves identification of living recommendations, based on high public health priority for decision-making, conditional recommendations with low to very low certainty of evidence and expected new emerging evidence likely to lead to updated recommendations. Before the expiry of the guidelines (usually 3-5 years after publication), individual living recommendations can be easily updated based on the systematic compilation and assessment of new critical evidence by the guideline developers. The guidelines updates can be digitally published and made immediately available to all end-users. Notification systems are available that can alert end-users to differing levels of updates (e.g. search found no new evidence; or new not consequential, evidence; or changed recommendation based or new evidence). Living guidelines, and the individual living recommendations they contain, have flexibility as some existing recommendations can be activated immediately as living recommendations as new relevant evidence emerges, while others can be retired if new evidence is not expected to change them.

WHO adopted the living approach in the development of the guidelines for clinical management of COVID-19. In addition, during COVID-19, the WHO Health Emergency team successfully produced several 'living guidelines', which allowed their recommendations to remain as up to date as possible, via as-frequent-as-necessary surveillance, assessment and incorporation of new relevant evidence as soon as it became available. The plan, led by the WHO Science Division is for WHO guidelines to be based on the most up-to-date evidence, the living guidelines approach should be expanded across the Organization. Experience will be gained by the WHO Science Division via the newly constituted Health Promotion Disease Prevention & Control (PPC) Divisional Office, with the WHO malaria guidelines potentially as an 'early-adopter', working in collaboration with existing partnerships with key expertise in conducting and sharing systematic reviews of evidence.

This represents a significant change from the current conventional model and needs organization-wide coordination, change management, methods, standards, processes, quality assurance, infrastructure and resourcing if it is to succeed at scale. There are many institutional procedures and requirements that need to change to fully enable this significant re-set at WHO. This includes the following: 1) procedures prioritize and decide which individual recommendations need living mode the search frequency and decision trigger criteria; 2) establishment and approval of "standing" guidelines development groups, available at relatively short notice; 3) new financial (LTA) and technical (GRC) approval procedures for Living Systematic Review (LSR) teams with sufficient capacity (including AI) and flexibility, respecting UN equity considerations; 4) definition and GRC approval (at planning form stage) of decision-making criteria for internal WHO small Committee, to consider new evidence as consequential to full GDG meeting & decisions regarding the living recommendations; 5) new publication procedure, e.g. results of evidence review & decisions immediately disseminated in digital platform e.g. MAGIC and publication of guidelines updates only if changes in recommendations (strength/certainty/content; 6) implementation of data sharing procedures from LSR for future contracts, country adaption, impact evaluation, use in SMART guidelines.

Criteria for choosing the test case areas are: i) the topic is of global importance and has been identified as a priority area by countries, global experts, funders or other (non-conflicted) organizations; ii) existing guideline recommendations are, or are likely soon to be, out-of-date due to recently available or soon-expected new practice/policy-changing evidence; iii) the relevant WHO Technical Unit and the Science Division (SCI) work together to co-develop the approach, and the required evidence-based healthcare and digital innovation expertise (in-house and/or via existing external partnerships) and resources (human, financial) to adopt a living guidelines approach are available. The first proposed technical area that fulfils all these criteria is the Global Malaria Programme (GMP), with the suggested areas of initial focus being vector control products, diagnostics and medicines. GMP have an established track record in the development of high quality, evidence-based WHO guidelines. The WHO malaria guidelines have been consolidated since 2021, exist in multiple languages in the currently used living guideline authoring and dissemination platform (MAGICapp) so would easily be able to be converted to living mode when needed.

The Science Division in close coordination with Health Promotion Disease Prevention & Control (PPC) Divisional Office is preparing a funding proposal for the introduction and progressing scaling-up of living guidelines across the Organisation with possible implementation in early 2026.

Update on WHO malaria guidelines development

Drs A. Bosman, L. Carrington, J. Cunningham, R. Okine, P. Olumese

28th meeting of the WHO Malaria Policy Advisory Group (MPAG)
Virtual meeting, 14–16 October 2025

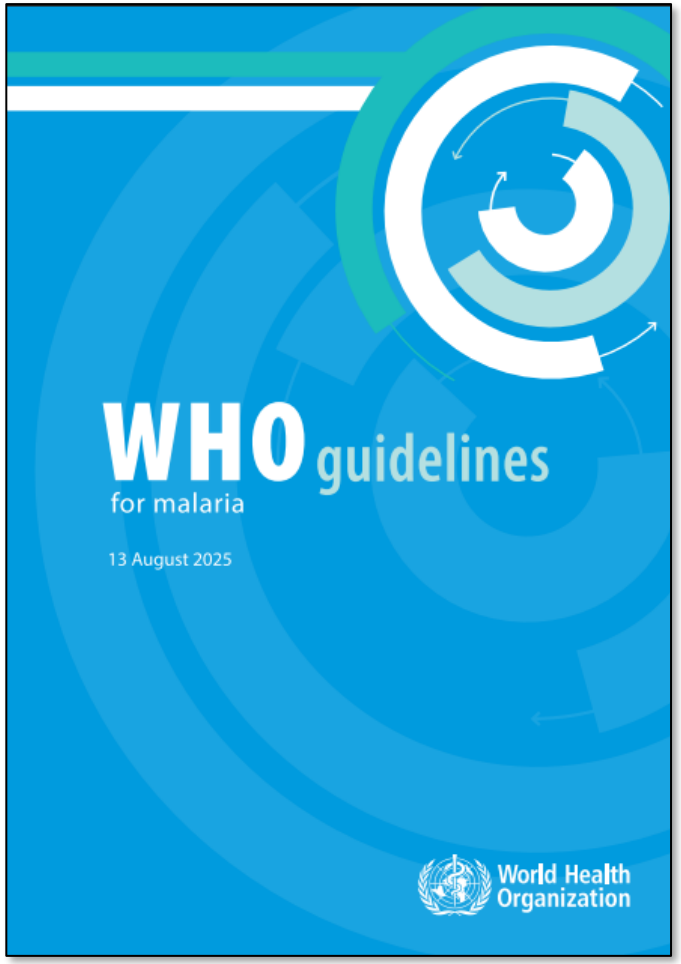
Malaria and Neglected Tropical Diseases

World Health Organization

Presentation outline

- Current status of WHO guidelines for malaria
- Plans to update vector control recommendations
- Plans to update malaria vaccines recommendations: 3-dose versus 4-dose schedule
- Plans to update the diagnostics recommendations
- Plans to update the chemotherapy recommandations
- Plans for transition to WHO living guidelines

Current WHO guidelines for malaria



- WHO Guidelines for Malaria (2021)
  - These consolidated guidelines replaced 2 WHO guidelines: the Guidelines for the treatment of malaria, 3rd edition and the Guidelines for malaria vector control.
  - The consolidated WHO Guidelines for malaria include
    - Prevention (vector control, preventive chemotherapies and vaccines)
    - Case management
    - Elimination and prevention of re-introduction
    - Surveillance*
  - As new evidence becomes available, the recommendations are reviewed and updated where appropriate, following WHO's transparent and rigorous guideline development process.
- The current 10th update was published on 13 August 2025 with updated recommendation for indoor residual spraying to prevent malaria. It incorporates evidence on two new insecticides (chlorfenapyr and isocycloseram), maintaining the same recommendation and emphasizing reduced use of DDT. It also adds a new recommendation for spatial emanators (spatial repellents) based on recent evidence.
- Available online: https://www.who.int/publications/i/item/guidelines-for-malaria

** Not developed following the WHO guidelines development process*

New resource enabling malaria systematic reviews

- To facilitate living evidence synthesis (and general procedures), process started to establish long-term agreement (LTA) with service provider of systematic reviews
  - Three-year agreement, possibility for two one-year extensions
  - Request for proposals (RFP) prepared and published early June on UNGM

- RFP received total of 14 submissions
- Ongoing submission of approval for contract initiation with 1 bidder

Plans to update the recommandations on malaria vector control

- Two active planning proposals with ~10 topics to be addressed over next 2.5 years
- The next GDG meeting will deliberate upon
  - **Quantitative reviews and meta-analyses**
    - Consolidated evidence of ITN effectiveness, across all 'sub-classes' of nets
    - Endectocides (ivermectin)
    - Eave tubes
  - Qualitative evidence synthesis on **contextual factors**
  - Review of existing **Good Practice Statements**, and potential development of two new ones
- The systematic review of contextual factors will be in-depth, building on scoping review completed in 2022
  - Review expected to span all available (and possibly forthcoming) interventions, to inform deliberations that will cover the work in both planning proposals

Priority PICO questions in current phase

- To prevent malaria in adults and children living in areas with ongoing human malaria transmission, should **ITNs with the capacity to interrupt malaria transmission potential (by means of mosquito susceptibility to insecticide(s) used on the net)** be deployed compared to **no nets, untreated nets, or nets unable to interrupt transmission potential (by means of mosquito resistance to insecticide(s) used on the net)**?

- In areas with ongoing human malaria transmission, should the drug **ivermectin** versus **no ivermectin** be given to entire communities **alone and/or in addition to the existing standard of vector control** (ITNs, IRS, etc) to reduce malaria transmission by mosquitoes and prevent the disease in adults and children?

- In areas with ongoing human malaria transmission or malariogenic potential, should **eave tubes** versus **no eave tubes** be deployed **alone and/or in addition to the existing standard of vector control** (ITNs, IRS and/or house screening) to prevent malaria in adults and children?

- Review of **contextual factors** (feasibility, acceptability, equity, resource considerations) surrounding vector control interventions – prospective review to inform all subsequent deliberations

Timelines for updating WHO guidelines on vector control

March-April 2026

GDG meeting: review evidence, formulation of recommendations

Systematic reviews on:
- ITNs
- Endectocides
- Eave tubes
- Contextual factors

April-May 2026

Recommendations drafted by GDG

June-July 2026

Editing, internal review

August 2026

External review group

September 2026

Guidelines Review Committee

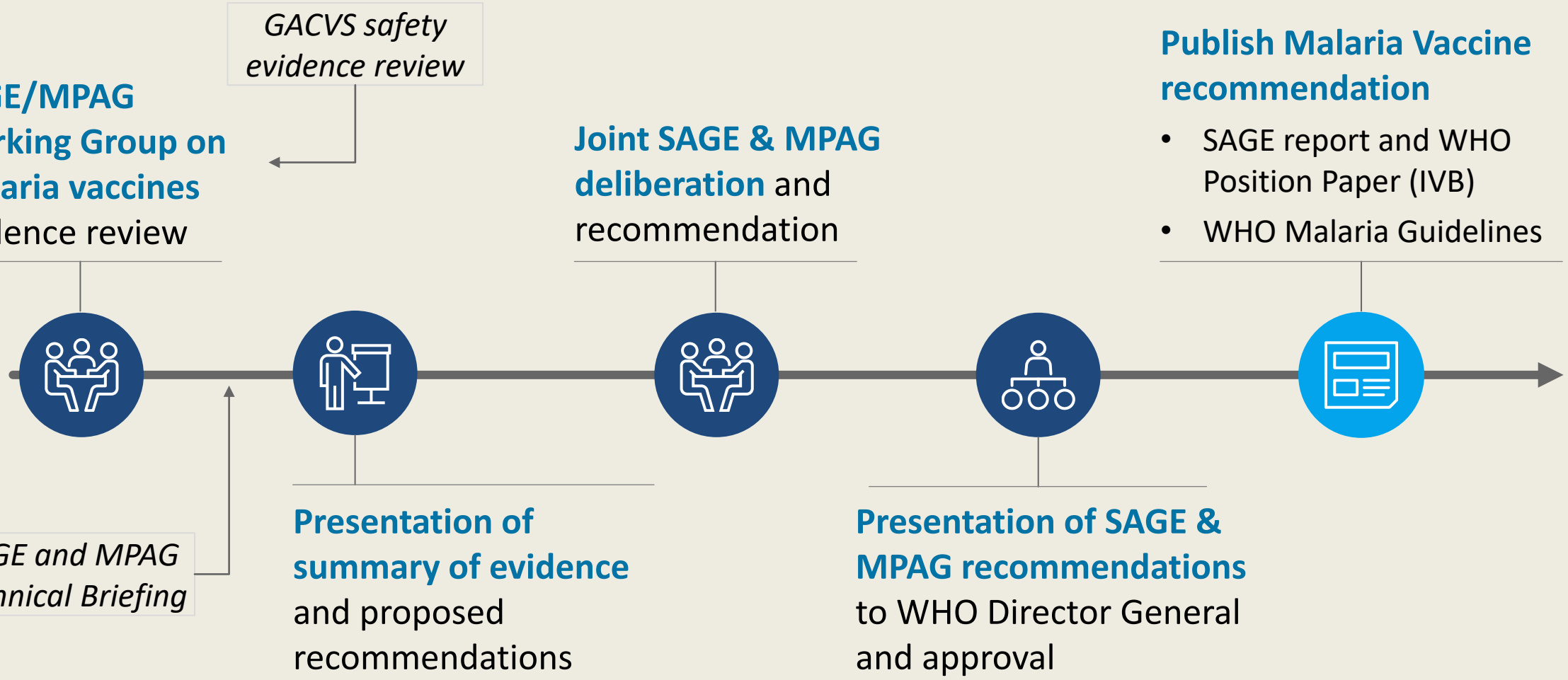
October 2026

Publication of new recommendations on ITNs endectocides and eave tubes

Assessment of a 3-dose versus 4-dose malaria vaccine schedule (1)

- SAGE and MPAG previously agreed WHO recommendations could be updated as new data become available [*particularly if the 4th vaccine dose provides little incremental impact over a safe and effective 3-dose schedule]*
- The SAGE/MPAG Working Group recommended the RTS,S/AS01 case-control study to complement the cluster-randomised MVIP pilot evaluations that measured population-level estimates, to assess specifically the benefits of the 4th dose
- Study objectives:
  - Measure estimates of safety and effectiveness at the individual level;
  - Assess the risk of severe malaria rebound following three doses (without a 4th dose); and
  - Establish the additional benefit of the fourth vaccine dose
- The study was conducted in Ghana, Kenya, and Malawi from October 2021 to March 2025

Pathway from evidence to WHO policy



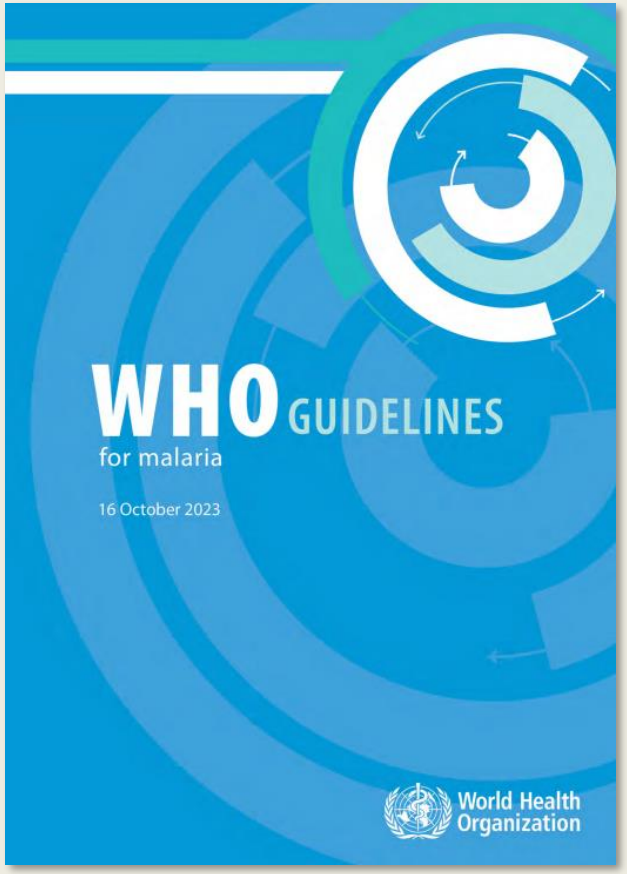
SAGE: Strategic Advisory Group of Experts on Immunization
MPAG: Malaria Policy Advisory Committee
GACVS: Global Advisory Committee on Vaccine Safety

Assessment of a 3-dose versus 4-dose malaria vaccine schedule (2)

- The MVIP Data Safety Monitoring Board (DSMB) reviewed the results in May 2025, followed by the SAGE/MPAG Working Group in July and August 2025
- The SAGE/MPAG Working Group recommendations were presented and reviewed in a joint session of SAGE and MPAG on 24 September 2025
- The SAGE and MPAG are asked to address the following questions:
  - Is a 3-dose malaria vaccine schedule safe and effective?
  - In areas of perennial malaria transmission (including low transmission), should a 3-dose malaria vaccine schedule be considered as an alternative to a 4-dose schedule in some contexts?

- Full evidence report
- GRADE, Certainty of evidence
- Evidence to decision table

- Background
- WHO Position (recommendation)



- Background
- WHO recommendation
- GRADE, Certainty of Evidence
- Evidence to decision table (Annex)
- Full evidence report (Annex)

Plans to update the recommandations on malaria diagnostics

- Burden of *P.knowlesi, P. malariae* and *P.ovale* spp is underestimated due to diagnostic limitations.
- Lack of accurate and species-specific diagnosis can lead to delayed +/- suboptimal treatment, increase risk of severe disease (Pk), relapse (Po), chronic infection (Pm).
- Microscopy unable to differentiate *P. knowlesi* from *P. malariae*
- Rapid diagnostic tests (RDTs) less well studied for detection of Pk, Pm, Po – decreased sensitivity? cross reactivity ?
- PCR and LAMP may provide accurate diagnosis but not widely commercialized and are not readily available in routine clinical settings, especially in low-resource areas.
- Evidence-based recommendations for testing are essential to ensure accurate detection, appropriate treatment, and effective malaria surveillance of these malaria species.
- 9 PIRT and PICO questions drafted - accuracy of microscopy, RDTs and NAAT for detecting Pk, accuracy of RDTs for detecting Pm and Po; use of RDTs compared to microscopy for Pk and impacts on timing and type of treatment and patient outcomes in settings where Pk is endemic with or without other species

Timelines for updating WHO guidelines on malaria diagnostics

11 -12 July

GDG scoping meeting

Systematic reviews

Sept-March 2026

March 2026

Recommendations drafted by GDG

External review group

April 2026

Guidelines Review Committee

May 2026

July 2026

Publication of recommendations on testing of *P.knowlesi* and use of RDTs for detection of *P.malariae* and *P. ovale* spp

Systematic reviews on:

- accuracy of microscopy, RDTs and NAAT for detecting *P. knowlesi*
- accuracy of RDTs for detecting *P. malariae* and *P. ovale* spp;
- use of RDTs compared to microscopy for *P. knowlesi* case management (impacts on timing and type of treatment and patient outcomes) in settings where *P. knowlesi* is endemic with or without other species

Update the recommandations on malaria chemotherapy: PICO questions

- Would giving antimalarial (dihydroartemisinin/piperaquine) as intermittent preventive treatment to HIV+ women taking daily cotrimoxazole during pregnancy reduce disease burden in pregnancy and adverse pregnancy and birth outcomes?
- In moderate to high transmission areas with documented *P. falciparum* partial resistance to artemisinin, should a single dose of 0.25 mg/kg bw primaquine be given with an ACT to patients with P. falciparum malaria (except pregnant women) to reduce transmission potential of malaria resistant parasites.
- Should babies <5kg body weight with uncomplicated malaria be treated with artemether-lumefantrine (2.5mg / 30mg).

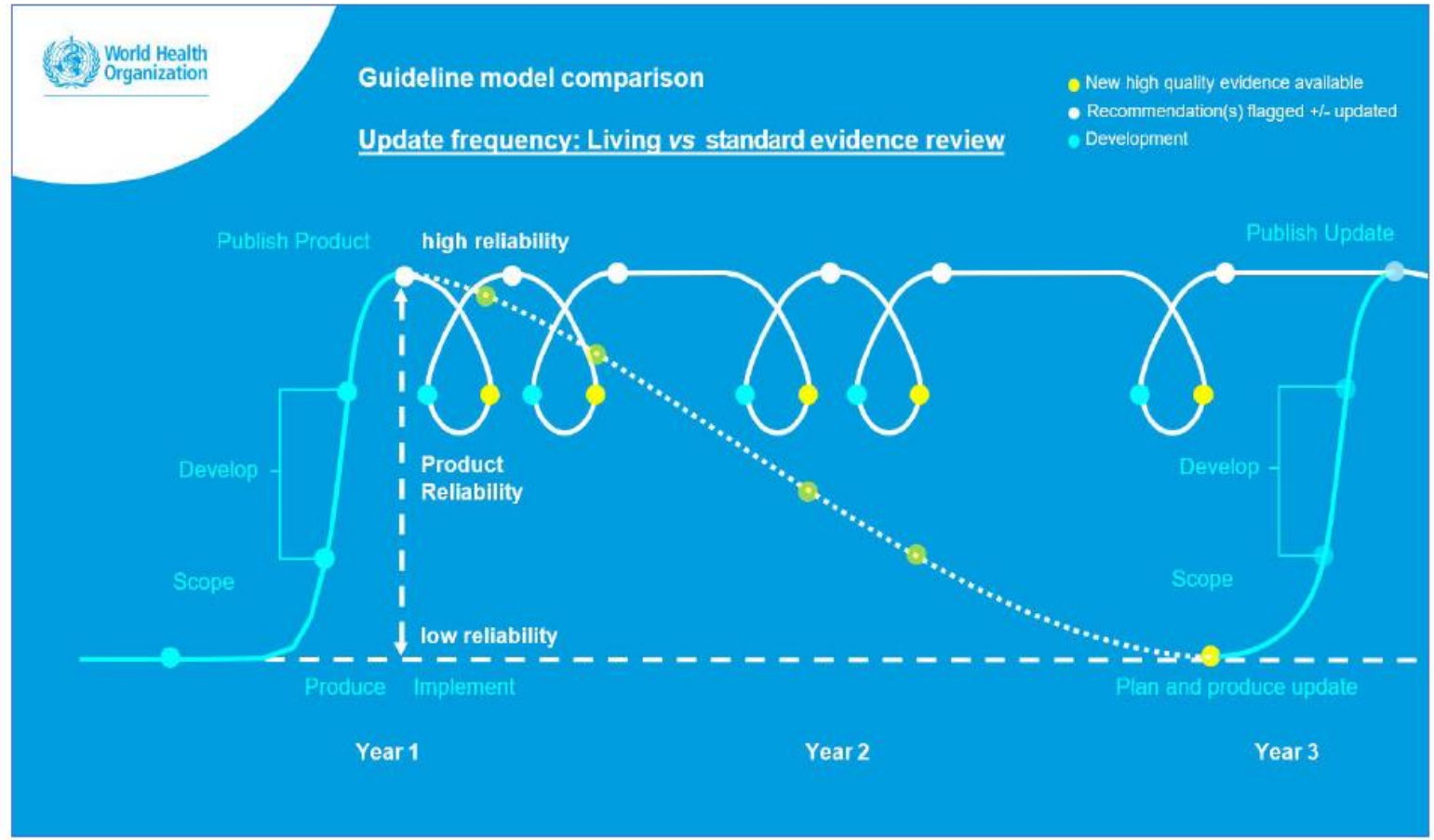
Timelines for updating WHO guidelines on malaria chemotherapy

Systematic reviews on:

- Intermittent preventive treatment regimens for malaria in HIV positive pregnant women
- Efficacy and safety of single dose primaquine to interrupt *P. falciparum* malaria transmission in paediatric patients compared to adults: a WWARN systematic review and individual patient data meta-analysis
- Regulatory approval documentation on “Coartem® baby”

Living guidelines

- Following a Jan 2025 workshop, **WHO SCI Division**, **GMP** and the **Future Evidence Foundation** are developing a **pilot initiative .**
- **Objective : Enable more frequent evidence reviews** for updating WHO conditional recommendations supported by **low or very low certainty evidence**.
- **Priority living recommendations:**
  - insecticide treated nets,
  - intermittent screening and treatment of malaria in pregnancy
  - tafenoquine/primaquine



World Health Organization

Three priority living recommendations identified by GMP

1. Consolidate different ITN recommendations published since 2019 to guide choice of nets in different transmission settings and insecticide resistance profiles and recommendations for single-, dual- and triple-active ingredient nets to support insecticide resistance management.
2. Screening and treatment of pregnant women, considering use of more sensitive diagnostic tests

#	Relevant ITN in question	Comparison	Recommendation	Year
1	Pyrethroid-only	N/A	Strong recommendation FOR High certainty evidence	2019
2	Pyrethroid+PBO	Pyrethroid-only	Conditional recommendation FOR Moderate certainty evidence	2021
3	Pyrethroid+chlorfenapyr	Pyrethroid-only	Strong recommendation FOR Moderate certainty evidence	2023
4	Pyrethroid+chlorfenapyr	Pyrethroid+PBO	Conditional recommendation FOR Moderate certainty evidence	2023
5	Pyrethroid+pyriproxifen	Pyrethroid-only	Conditional recommendation FOR Moderate certainty evidence	2023
6	Pyrethroid+pyriproxifen	Pyrethroid+PBO	Conditional recommendation AGAINST Moderate certainty evidence	2023

3. Updating WHO recommendations on 8-aminoquinolines, in relation to
   - Efficacy and safety of tafenoquine compared to primaquine given at the recommended total dose of 7.0 mg/kg
   - Efficacy and safety of tafenoquine + chloroquine at the current doses outside South America
   - Efficacy and safety of tafenoquine + different ACTs at the current doses in and outside South America
   - Efficacy and safety of tafenoquine at higher doses (450mg) + ACT in areas where P. vivax Chesson strains are prevalent
   - Safety of primaquine high dose regimen (7.0mg/kg total dose) given to female with intermediate levels of G6PD activity (30-70%)

Planned activities and resource requirements

For each of the GMP priority topics deliverables and expected times

LEG malaria priorities	Deliverables	Year 1				Year 2				Year 3			
		Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4
Insecticide-Treated Nets	Evidence generation	x											
	GDG deliberations		x										
	Recommendations												
Screening and treatment pregnant women	Preparatory work												
	Evidence generation												
	GDG deliberations												
	Recommendations												
Tafenoquine & Primaquine	Evidence generation												
	GDG deliberations												
	Recommendations												

x = activities funded under another Gates Foundation grant (GMP 2025-2027)

Planned grant submission from SCI to Gates Foundation as part of SCI umbrella grant

Decision expected in June

GMP resource requirements for living guidelines not covered by ongoing 2025-2027 grant – need for clarification

WHO Living Guideline development process

Prioritize / decide which *individual* recommendations need living mode; search frequency; decision trigger criteria

Need **'standing' GDG**, available short notice

Need **LSR team** with sufficient capacity (incl AI), flexibilty, but ensure equity considered

Small C'tee (e.g. WHO SC Chair, LSR lead, ext methodologist, GDG Chairs x2) **decides if new evidence is consequential** (based on *a priori* decision trigger criteria) +/- activates full GDG meeting & decisions re rec changes

Publish results / decisions / any changes **immediately in digital platform** e.g. MAGIC

Publish only 'major' updates (criteria TBC e.g. only when strength/direction of rec changes) **as formal update / re-issued pdf**

Make all data available for adaption, impact evaluation, use in SMART guidelines, etc

Scope the guideline

Consider all relevant evidence for decision-making

Set up guideline development group and external review group

Manage declarations of interest

Formulate PICO/SPICE or other questions and select outcomes

GRC approval - Proposal incl PICOs, GDG, DOI

Evidence retrieval, assessment, synthesis

Appraise certainty of the body of evidence

GRADE GRADE CERQual

Formulate recommendations

Include explicit consideration of:

- **Benefits and harms**
- **Resource use/feasibility**
- **Health equity/non-discrimination**
- **Human rights/sociocultural acceptability**

GRC review & approval processes: any changes, variations needed??

Disseminate, +/-adapt, implement, update

GRC approval - Final guideline

Evaluate impact