

WHO Malaria Technical Updates

- the use of antimalarial medicines

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Global **Malaria** Programme



**World Health
Organization**

Key antimalarial interventions & strategies

Prevention

- Insecticide-treated mosquito nets
- Indoor Residual Spraying
- Larviciding

Preventive Chemotherapy

- IPT in pregnancy (IPTp)
- Perennial Malaria Chemoprevention
- Seasonal Malaria Chemoprevention
- IPT in School Children
- Post Discharge malaria chemoprevention
- Mass Drug Administration

Malaria vaccine

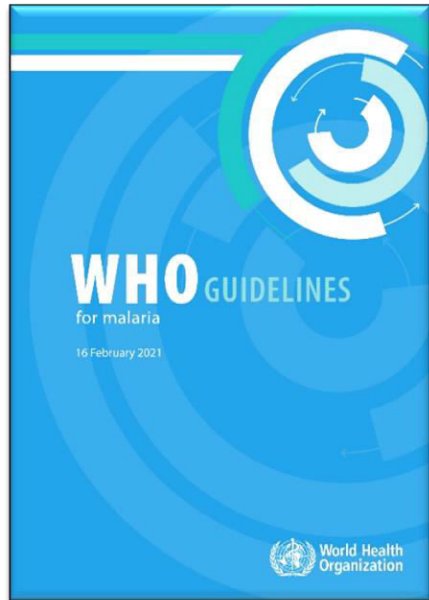
Diagnosis & Treatment

- Parasite based diagnosis
 - Microscopy
 - Rapid Diagnostic Tests
 - Artemisinin-based combination therapies (ACTs)
 - Severe Malaria
 - Artesunate
- Case management service delivery areas::
- Health facilities
 - Community Case Management
 - Private sector

Surveillance, M & E

- Routine HMIS
- Malaria surveillance and response systems
- Household surveys
- Health Facility Surveys

Strengthening health systems in endemic countries



- WHO Guidelines for Malaria (2021)
 - These consolidated guidelines replace 2 guideline documents on the WHO website: the Guidelines for the treatment of malaria, 3rd edition and the Guidelines for malaria vector control.
 - The sections in the WHO Guidelines for malaria includes
 - Prevention (Vector control, preventive chemotherapies and Vaccine)
 - Case Management
 - Elimination and prevention of re-introduction
 - Surveillance
 - As new evidence becomes available, the recommendations will be reviewed and updated, where appropriate, **using WHO's transparent and rigorous guideline development process.**
- Published in February 2021;
- Latest update – 16th October 2023, and will be updated on a continuing basis
- Available online: <https://www.who.int/publications/i/item/guidelines-for-malaria>

Malaria Case Management



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- All suspected malaria cases should have a parasitological test (microscopy or RDT) to confirm the diagnosis.
- Deployment of both microscopy and RDTs should be supported by a quality assurance programme
 - The results of parasitological diagnosis should be available within less than two hours of the patient presenting. In the absence or delay, patients with suspected severe malaria, and other high-risk groups, should be treated on clinical grounds.



Strong recommendation for, High certainty evidence

Updated

Artemisinin-based combination therapy (2015)

Treat children and adults with uncomplicated *P. falciparum* malaria with one of the following ACTs*:

- artemether-lumefantrine (AL)
- artesunate-amodiaquine (AS+AQ)
- artesunate-mefloquine (ASMQ)
- dihydroartemisinin-piperaquine (DHAP)
- artesunate + sulfadoxine-pyrimethamine (AS+SP)
- artesunate-pyronaridine (ASPY) (2022)

*artesunate + sulfadoxine-pyrimethamine and artesunate-pyronaridine are not recommended for use in the first trimester of pregnancy. For details of treatment using ACTs in the first trimester of pregnancy, see details below.



Strong recommendation for, High certainty evidence

Duration of ACT treatment (2015)

ACT regimens should provide 3 days' treatment with an artemisinin derivative.

Strong recommendation for, Low certainty evidence

Reducing the transmissibility of treated *P. falciparum* infections (2015)

In low-transmission areas, give a single dose of 0.25 mg/kg bw primaquine with ACT to patients with *P. falciparum* malaria (except pregnant women, infants aged < 6 months and women breastfeeding infants aged < 6 months) to reduce transmission. G6PD testing is not required.



Strong recommendation for, Low certainty evidence

Updated

Treatment in the first trimester of pregnancy (2022)

Treat pregnant women with uncomplicated *P. falciparum* malaria with artemether-lumefantrine during the first trimester.

Remarks

- Limited exposures to other ACTs (artesunate-amodiaquine, artesunate-mefloquine and dihydroartemisinin-piperaquine) suggest that the current evidence is insufficient to make a recommendation for routine use of these other ACTs in the first trimester of pregnancy. However, consistent with the previous WHO recommendation that provided for limited use of ACTs if the first-line recommended medicine was not available, these other ACTs may be used where artemether-lumefantrine is not a recommended ACT for uncomplicated malaria or is not available, given the demonstrated poorer outcomes of quinine treatment, along with the challenges of adherence to a seven-day course of treatment.
- Antifolates are contraindicated in the first trimester of pregnancy. Therefore, ACTs containing sulfadoxine-pyrimethamine are contraindicated during the first trimester of pregnancy.
- There is currently no documented record of the use of artesunate-pyronaridine during the first trimester of pregnancy.
- Continued pharmacovigilance and clinical research, including prospective controlled trials on the efficacy and safety of antimalarial medicines for the treatment of malaria in pregnancy, should be supported and funded.



- Treat infants weighing less than 5 kg with an ACT dosed at the same mg/kg target as for children weighing 5 kg
- In people who have HIV/AIDS avoid AS+SP if on treatment with co-trimoxazole and avoid AS+AQ if on treatment with efavirenz.
- Treat travelers returning to non-endemic settings with uncomplicated *P. falciparum* malaria with an ACT



- In areas with chloroquine susceptible *P. vivax*, treat using either an ACT or chloroquine.
- In areas with chloroquine resistant *P. vivax*, treat with an ACT*

For use of ACT in first trimester of pregnancy, same recommendation as for treatment of *P.falciparum



- The G6PD status of patients should be used to guide the administration of primaquine for relapse prevention
- Where status is unknown and G6PD testing is unavailable, the decision to prescribe primaquine must be based on an assessment of the risks and benefits of treating versus not treating
- To prevent future relapse, treat people with vivax or ovale malaria (excluding pregnant or women breastfeeding, infants < 6 months of age, and people with G6PD deficiency) with a 14-day course (0.25-0.5mg/kg daily) of primaquine in all transmission setting
- In people with moderate G6PD deficiency, consider relapse prevention with primaquine 0.75 mg base/kg once a week for 8 weeks under close medical supervision.
- In women who are pregnant or breastfeeding, consider weekly chemoprophylaxis with chloroquine until delivery and breastfeeding is complete, then treat with 14 days of primaquine to prevent future relapse.



Strong recommendation for, Very low certainty evidence

New

Short-course standard dose primaquine treatment (2022)

To prevent relapse, an additional treatment option of using primaquine 0.5 mg/kg/day for seven days is recommended to treat *P. vivax* or *P. ovale* malaria in children and adults (except pregnant women, infants aged < 6 months, women breastfeeding infants aged < 6 months, women breastfeeding older infants unless they are known not to be G6PD deficient, and people with G6PD deficiency).

Remarks

- As recommended previously, the G6PD status of patients should be used to guide administration of primaquine for preventing relapse.
- A shorter regimen can lead to better adherence compared to the standard 14-day regimen and thus to fewer relapses.



Conditional recommendation against, Very low certainty evidence

New

Short-course standard high-dose primaquine treatment (2022)

To prevent relapse, WHO recommends against an additional treatment option of using primaquine 1.0 mg/kg/day for seven days to treat *P. vivax* or *P. ovale* malaria.

Remarks

- There is a significantly increased risk of serious adverse events (moderate to large undesirable effect) at this daily dosing of the standard high dose.



- **Therapeutic objectives**
 - Main objective is to prevent the patient from dying
 - Secondary objectives are to prevent disabilities and prevention of recrudescence infection
- **Death from severe malaria often occurs within hours of onset of symptoms or admission to hospital**
 - Essential that therapeutic concentrations of a highly effective antimalarial are achieved as soon as possible
- **Management of severe malaria comprises four main areas**
 - Clinical assessment of patient
 - Specific antimalarial treatment
 - Additional treatments (managements of other complications), and
 - Supportive care

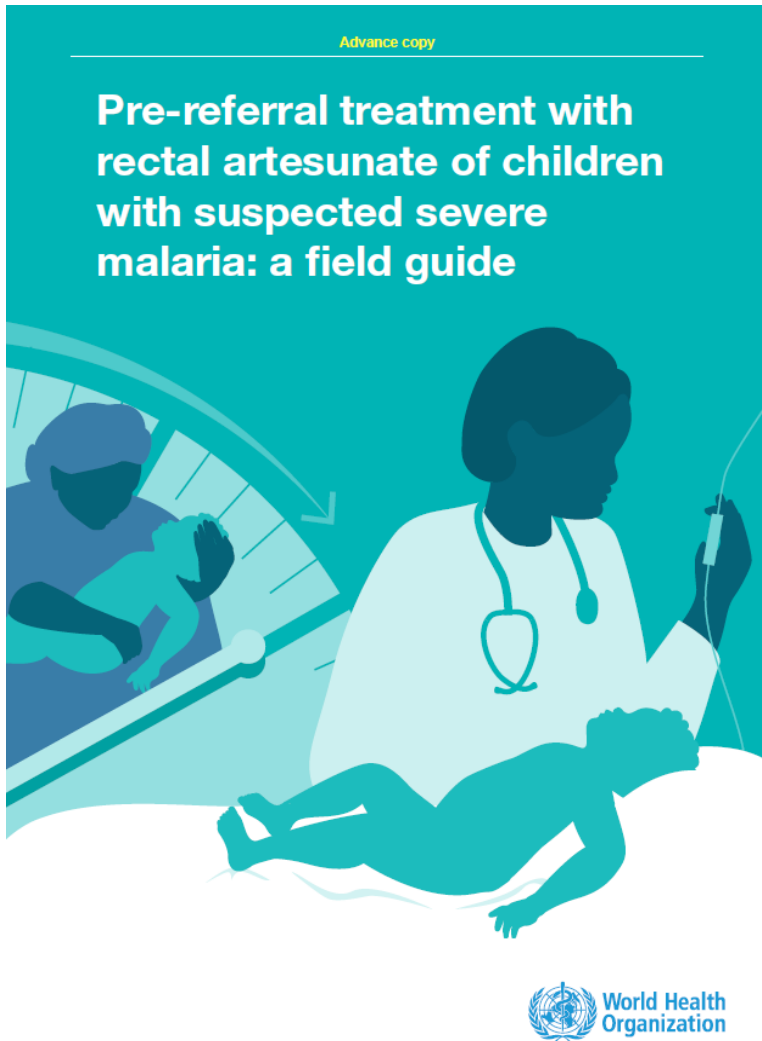


- Treat all patients with severe malaria (including infants, pregnant women in all trimester, and lactating women) with intravenous or intramuscular artesunate for at least 24 hours and until able to tolerate oral medication.
- After at least 24 hours of parenteral therapy, AND able to tolerate oral therapy, complete treatment with three-days of an ACT
- Children weighing less than 20 kg should receive a higher dose of artesunate (3 mg/kg/dose) than others (2.4 mg/kg/dose) to ensure an equivalent drug exposure.
- If artesunate is not available, use artemether in preference to quinine for treating severe malaria



- **Pre-referral treatment**

- In settings where complete treatment of severe malaria is not possible, but injections are available, give children and adults a single dose of intramuscular artesunate and refer to an appropriate facility for further care. Use artemether or quinine if artesunate is not available
- In settings where intramuscular injections are unavailable, treat children below the age of six years with a single dose of rectal artesunate and refer immediately to an appropriate facility for further care.
- Where referral is not possible after the initial treatment,
 - pre-referral medication should be continued until the patient can tolerate oral medication, then,
 - administer a complete course of an effective ACT



- Implementation field guide
 - The purpose of the field guide is to support the effective deployment of rectal artesunate as a pre-referral treatment of suspected severe malaria in line with the guidelines.



- CCM of malaria delivered as part of integrated CCM (iCCM), which includes the treatment of pneumonia and diarrheal diseases.
- Trained community providers (CHWs, Medicine Sellers or Retailers) should be provided with:
 - Rapid Diagnostic Tests (RDTs)
 - ACTs for treatment of uncomplicated malaria.
 - Rectal artemisinin suppositories for pre-referral treatment of severe malaria.
 - Information, Education and Communication materials.
 - simple patient registers and reporting forms.

Preventive Chemotherapies

Global **Malaria** Programme



**World Health
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Intermittent preventive treatment of malaria in pregnancy (IPTp)

Strong recommendation for , Moderate certainty evidence

Updated

Intermittent preventive treatment of malaria in pregnancy (2022)

In malaria-endemic areas, pregnant women of all gravidities should be given antimalarial medicine at predetermined intervals to reduce disease burden in pregnancy and adverse pregnancy and birth outcomes.

- *SP has been widely used for malaria chemoprevention during pregnancy and remains effective in improving key pregnancy outcomes.*
- *IPTp-SP should start as early as possible in the second trimester and not before week 13 of pregnancy.*
- *Doses should be given at least one month apart, with the objective of ensuring that at least three doses are received.*
- *ANC contacts remain an important platform for delivering IPTp. Where inequities in ANC service and reach exist, other delivery methods (such as the use of community health workers) may be explored, ensuring that ANC attendance is maintained and underlying inequities in ANC delivery are addressed.*
- *IPTp is generally highly cost-effective, widely accepted, feasible for delivery and justified by a large body of evidence generated over several decades.*

Perennial Malaria Chemoprevention (former IPTi)

Conditional recommendation for,
moderate-certainty evidence

Updated

In areas of moderate to high perennial malaria transmission, children belonging to age groups at high risk of severe malaria can be given antimalarial medicines at predefined intervals to reduce disease burden.

- Perennial malaria chemoprevention (PMC) schedules should be informed by the age pattern of severe malaria admissions, the duration of protection of the selected drug, and the feasibility and affordability of delivering each additional PMC course (see “Practical info”).
- Sulfadoxine-pyrimethamine (SP) has been widely used for chemoprevention in Africa, including for PMC. Artemisinin-based combination therapies (ACTs) have been effective when used for PMC, but evidence is limited on their safety, efficacy, adherence to multi-day regimens, and cost-effectiveness in the context of PMC.
- Previously, PMC was recommended in infants (<12 months of age) as intermittent preventive treatment (IPTi). Since the initial recommendation, new data have documented the value of malaria chemoprevention in children aged 12 to 24 months.
- The Expanded Programme on Immunization (EPI) platform remains important for delivering PMC. Other methods of delivery can be explored to optimize access to PMC and integration with other health interventions.
- Moderate to high perennial malaria transmission settings are defined as areas with *P. falciparum* parasite prevalence greater than 10% or an annual parasite incidence greater than 250 per 1000 [29]. These thresholds are indicative and should not be regarded as absolutes for determining applicability of the PMC recommendation.

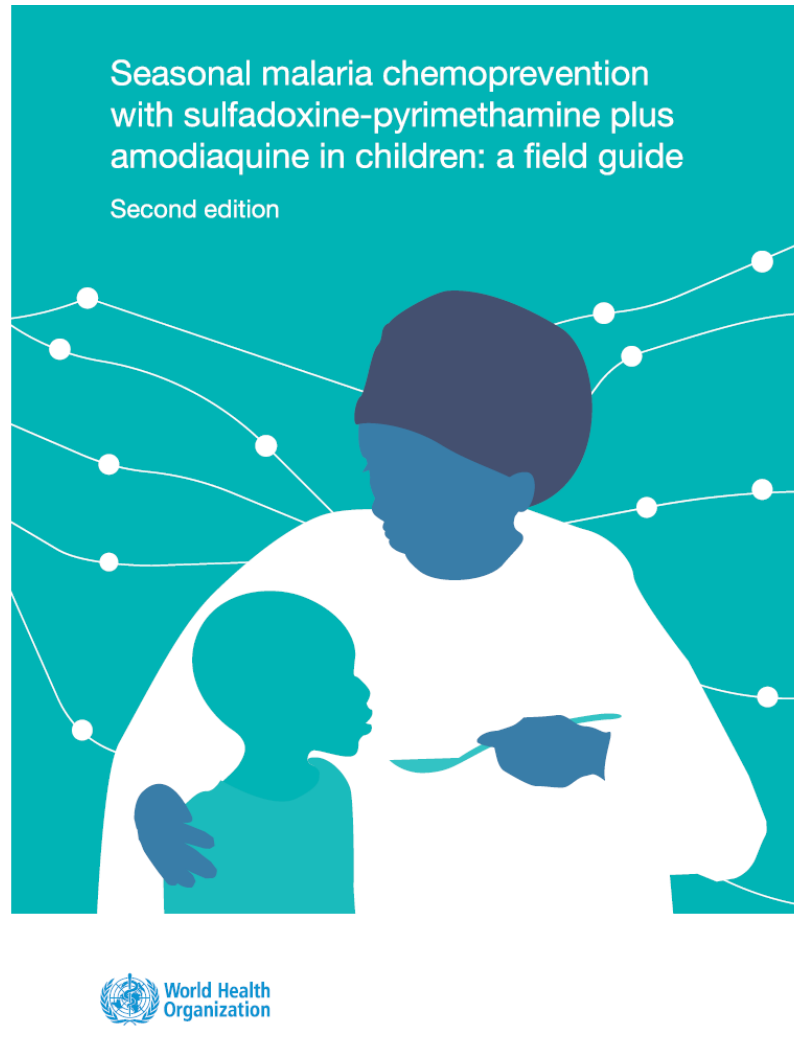
Seasonal Malaria Chemoprevention

Strong recommendation for, moderate-certainty evidence

Updated

In areas of seasonal malaria transmission, children belonging to age groups at high risk of severe malaria should be given antimalarial medicines during peak malaria transmission seasons to reduce disease burden.

- Eligibility for seasonal malaria chemoprevention (SMC) is defined by the seasonality of malaria transmission and age groups at risk of severe malaria. Thresholds for assessing these criteria change over time and location. Malaria programmes should assess the suitability of SMC based on the local malaria epidemiology and available funding. The added value of a seasonally targeted intervention is likely to be greatest where transmission is intensely seasonal.
- Monthly cycles of sulfadoxine-pyrimethamine plus amodiaquine (SP+AQ) have been widely used for SMC in African children under 5 years old and have been shown to be efficacious, safe, well tolerated, available and inexpensive [182].



- Updated implementation field guide to reflect current Guidelines recommendation
 - specify age groups, transmission intensity thresholds, numbers of doses or cycles, or specific drugs.

26 May 2023

<https://www.who.int/publications/i/item/9789240073692>

Intermittent preventive treatment of malaria in school-aged children (IPTsc)

Conditional recommendation for , Low certainty evidence

New

Intermittent preventive treatment of malaria in school-aged children (2022)

School-aged children living in malaria-endemic settings with moderate to high perennial or seasonal transmission can be given a full therapeutic course of antimalarial medicine at predetermined times as chemoprevention to reduce disease burden.

- *IPTsc has been evaluated in children aged 5–15 years. The burden of malaria and benefits of IPTsc may vary across this age range, but evidence is limited.*
- *National malaria programmes can consider IPTsc if resources allow for its introduction among school-aged children without compromising chemoprevention interventions for those carrying the highest burden of severe disease, such as children < 5 years old.*
- *Schools may provide a low-cost means to deliver chemoprevention to school-aged children. However seasonal variation in malaria transmission and the timing of school terms, as well as equity concerns, may mean alternative delivery channels are needed to maximize impact.*
- *First- and second-line malaria treatments should not be used for IPTsc if safe and effective alternatives are available (see “Practical info”).*
- *The dosing schedule for IPTsc should be informed by the local malaria epidemiology and timed to give protection during the period of greatest malaria risk (see “Practical info”).*
- *Moderate to high malaria transmission settings are defined as areas with *P. falciparum* parasite prevalence greater than 10% or an annual parasite incidence greater than 250 per 1000 [31]. These thresholds are indicative and should not be regarded as absolutes for determining applicability of the IPTsc recommendation.*

Conditional recommendation for , Moderate certainty evidence

New

Post-discharge malaria chemoprevention (PDMC)

Children admitted to hospital with severe anaemia living in settings with moderate to high malaria transmission should be given a full therapeutic course of an antimalarial medicine at predetermined times following discharge from hospital to reduce re-admission and death.

- *PDMC should be given to children following admission with severe anaemia [138] that is not due to blood loss following trauma, surgery, malignancy or a bleeding disorder.*
- *PDMC implementation should be tailored to admissions of children with severe anaemia and consider the duration of protection of the selected antimalarial, and the feasibility and affordability of delivering each additional PDMC course (see “Practical info”).*
- *Moderate to high perennial malaria transmission settings are defined as areas with a *P. falciparum* parasite prevalence greater than 10% or an annual parasite incidence greater than 250 per 1000 [31]. These thresholds are indicative and should not be regarded as absolute for determining applicability of the PDMC recommendation.*

Overview - implementation guidance documents status update

- **SMC**
 - Existing Implementation Guides / Field Manuals
 - Available, update in progress
- **IPTp at community level**
 - New field manual will be developed
- **PMC (IPTi+)**
 - Projects are now underway to provide the evidence required for expansion of IPTi beyond the current recommendation and transition to PMC.
- **IPTsc and PDMC**
 - Implementation Guidance document not yet available
 - Deployment studies and experience required to develop implementation guidance documents

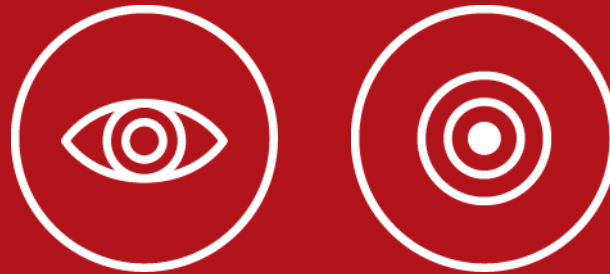
Mass Drug Administration (MDA)

Technical area	Strength & evidence	For/against	Recommendation	New/update
MDA	Conditional, low-certainty	For	MDA in moderate-high transmission for short-term <i>P. falciparum</i> burden reduction	New
MDA	Conditional, low-certainty	For	MDA in emergency settings for short-term <i>P. falciparum</i> burden reduction	New
MDA	Conditional, low-certainty	For	MDA to reduce <i>P. falciparum</i> transmission in very low to low transmission	New
MDA	Conditional, very low-certainty	Against	MDA to reduce <i>P. falciparum</i> transmission in moderate to high transmission	New
MDA	Conditional, very low-certainty	For	MDA with antimalarial medicine to reduce <i>P. vivax</i> transmission	New
MDA	Conditional, very low-certainty	Against	MDA with 8-aminoquinoline alone to reduce <i>P. vivax</i> transmission	New

Conditional recommendation for

Conditional recommendation against

Surveillance



Malaria surveillance



Pillar 3 of the GTS 2016-2030

Transform Malaria
Surveillance into a
Core Intervention

	High	Moderate	Low	Very Low	Zero	Maintaining Zero
Case detection	Passive case detection	Passive case detection	Passive case detection	Passive + Active case detection		
Recording	Outpatient and inpatient registers	Outpatient and inpatient registers	Outpatient and inpatient registers	Individual patient forms		
Reporting frequency	Monthly	Weekly	Weekly	Real Time		
Resolution of reported data	Aggregate case by age	Aggregate case by age	Aggregate case or line listing by age	Case reports with recommended details on patient history		
Data use: health facility	Data analysed and displayed weekly	Data analysed and displayed weekly	Data analysed and displayed weekly	Data analysed and displayed in real time		
Data use: district	Data analysed and displayed monthly	Data analysed and displayed monthly	Data analysed and displayed weekly	Data analysed and displayed weekly		
Data use: province & national	Data analysed and displayed monthly or quarterly	Data analysed and displayed monthly	Data analysed and displayed monthly	Data analysed and displayed weekly		
Response time	Monthly	Monthly or weekly	Weekly	Case & foci investigation within 48 hours, foci response within 7 days		
Feedback frequency to lower level	Annually	Quarterly	Monthly	Every two weeks		
Surveillance system monitoring	Annually	Quarterly	Monthly	Every two weeks		



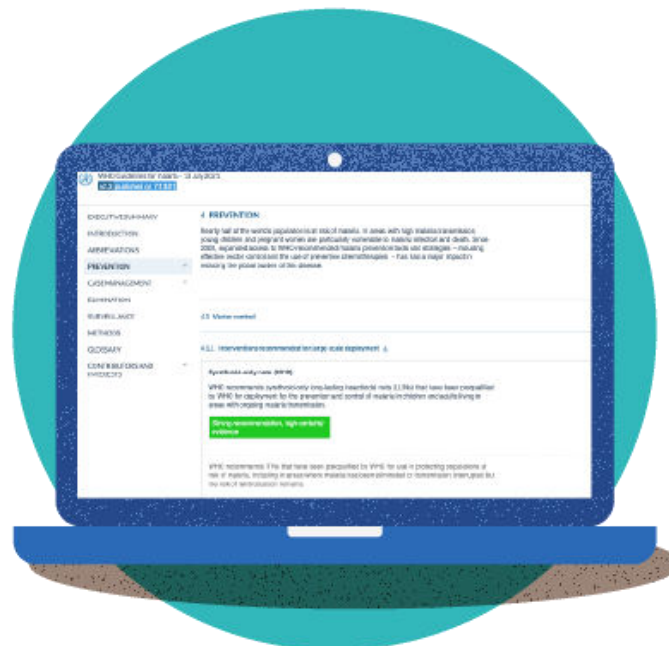
- **Prevention of relapses**
 - Use of Tafenoquine
 - Updating primaquine dosage, regimen and safety
- **Timelines**
 - December 2024



How to access WHO malaria guidance



1 WHO Global Malaria Programme website



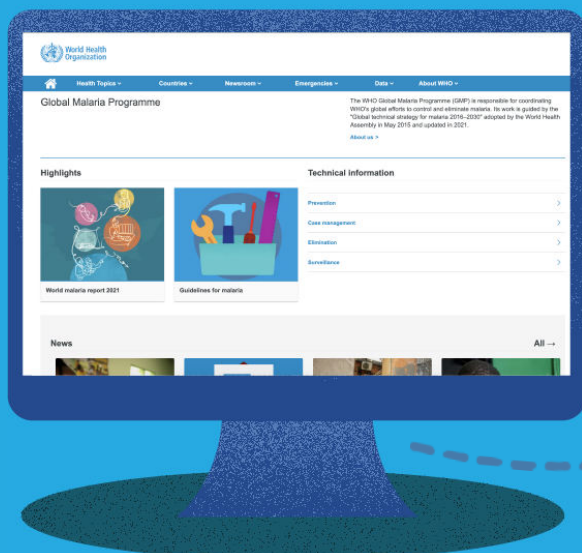
2 MAGICapp



3 WHO Malaria Toolkit app



Ways to access WHO malaria guidance



1

The [WHO Global Malaria Programme website](#) is the main gateway through which national malaria programmes and partners can access the most up-to-date malaria guidance.



The new consolidated [WHO Guidelines for malaria](#) bring together all current WHO recommendations on malaria in one easy-to-navigate web-based platform.



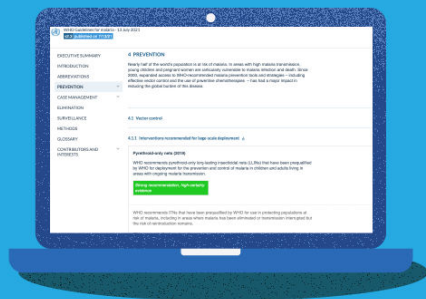
They are a living resource that will be updated periodically as new evidence becomes available.



Ways to access WHO malaria guidance

WHO's malaria guidance can also be found on 2 digital platforms:

2



Through [MAGICApp](#), you can access a consolidated set of all WHO malaria guidance, including:



All official WHO recommendations



Operational manuals



Handbooks

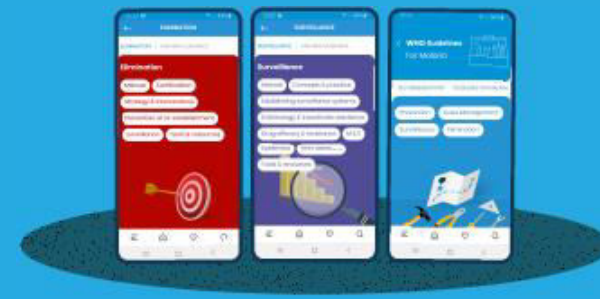


Frameworks



And links to other resources

3



All WHO recommendations can also be accessed through an easy-to-navigate mobile "[Malaria Toolkit app](#)".

The app is available for iOS devices and Android devices.

In addition to the WHO recommendations, it provides the latest data and trends from the *World malaria report*.

Keep our eye on the prize: a world free of malaria

Thank you