PMI | U.S. PRESIDENT'S MALARIA INITIATIVE

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LAST UPDATED:04/08/2023

THAILAND MALARIA PROFILE

I. ABOUT

Launched in 2005, the U.S. President's Malaria Initiative (PMI) supports implementation of malaria prevention and treatment measures as well as cross-cutting interventions. PMI's 2021–2026 strategy, *End Malaria Faster*, envisions a world free of malaria within our generation, with the goal of preventing malaria cases, reducing malaria deaths and illness, and eliminating malaria in PMI partner countries. PMI currently supports 274 countries in Sub-Saharan Africa and three programs across the Greater Mekong Subregion in Southeast Asia to control and eliminate malaria. Thailand began implementation as a PMI partner country in FY 2011. Please see the Thailand, Lao PDR, and Regional Malaria Operational Plan for more information on PMI's approach and investments.

II. CONTEXT

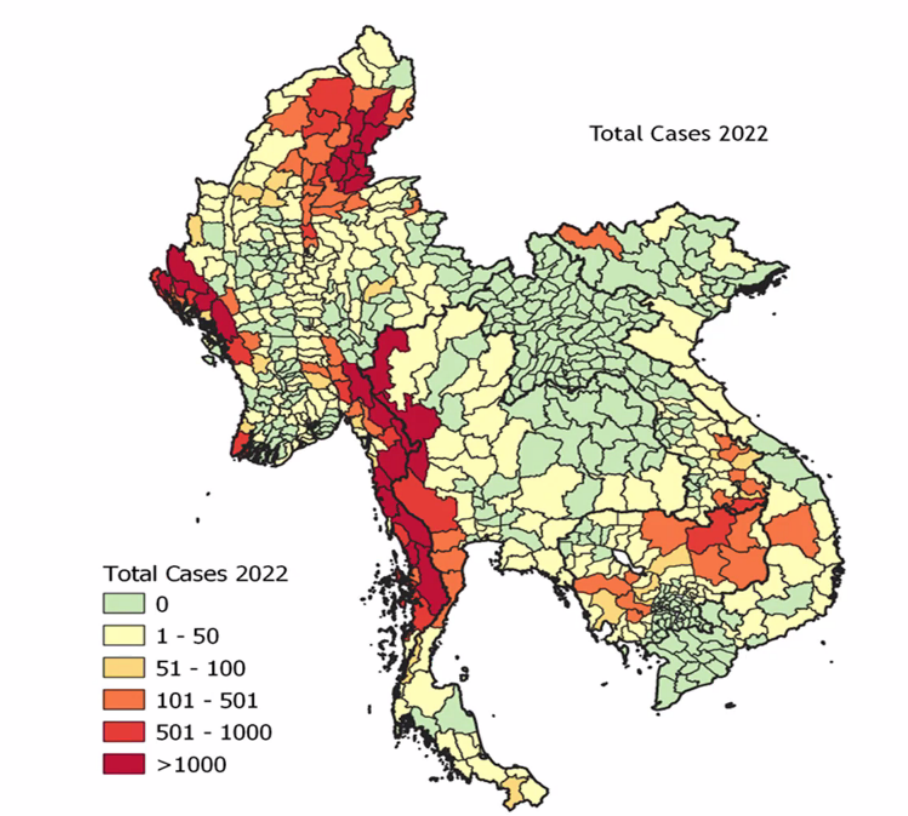
Table 1. General Demographics and Malaria Situation

Population	69,648,117 (2022 est.) https://www.cia.gov/the-world-factbook/countries/thailand/#people-and-society
Population at risk of malaria	947,273 (A1/A2 risk areas, migrants, refugees, and border foci) (Division of Vector Borne Disease [DVBD], 2023)
Malaria prevalence	N/A
Malaria incidence/1,000 population at risk	1.56/1,000 (DVBD, 2022)

A1: Active foci, defined as villages with reported indigenous cases in current fiscal year; A2: Residual nonactive foci, defined as villages without indigenous cases for one to three years.

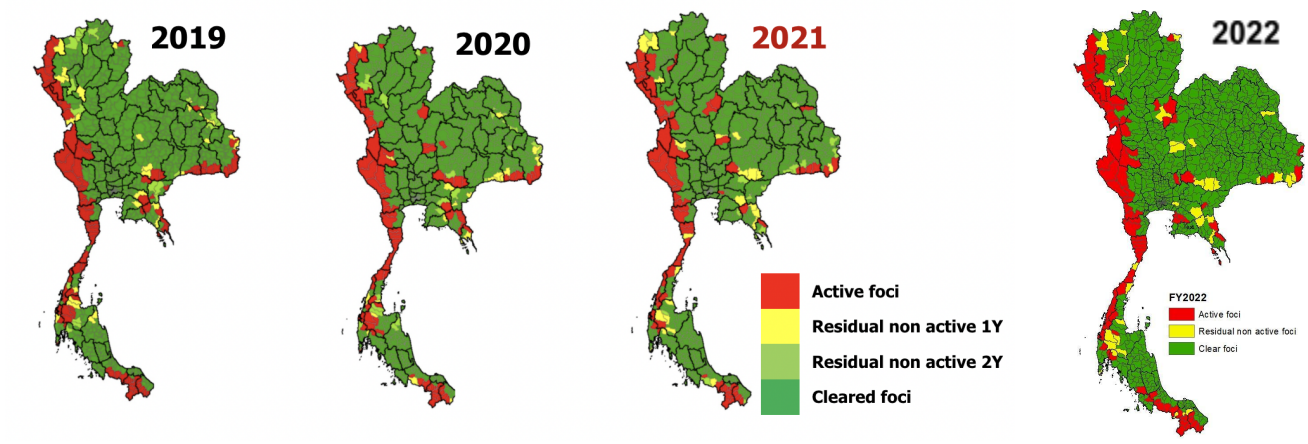
STRATIFICATION

Figure 1. Regional Malaria Incidence Map



Source: World Health Organization (WHO) 2022.

Figure 2. Malaria Foci Classification Maps, 2019–2022



Source: DVBD and Country Dialogue presentation, January 2023.

Table 2. Malaria Parasites and Vectors

Principal malaria parasites	*Plasmodium vivax* (94%) and *P. falciparum* (2%) Others: *P. malariae* (0.6%), *P. knowlesi* (2.3%)
Principal malaria vectors[1]	*An. dirus*, *An. minimus*, *An. maculatus,* and *An. jeyporiensis* (WHO, World Malaria Report 2018)

[1] See the entomological monitoring section of the MOP for more details on vector bionomics and insecticide resistance and the indoor residual spraying section for details on residual efficacy.

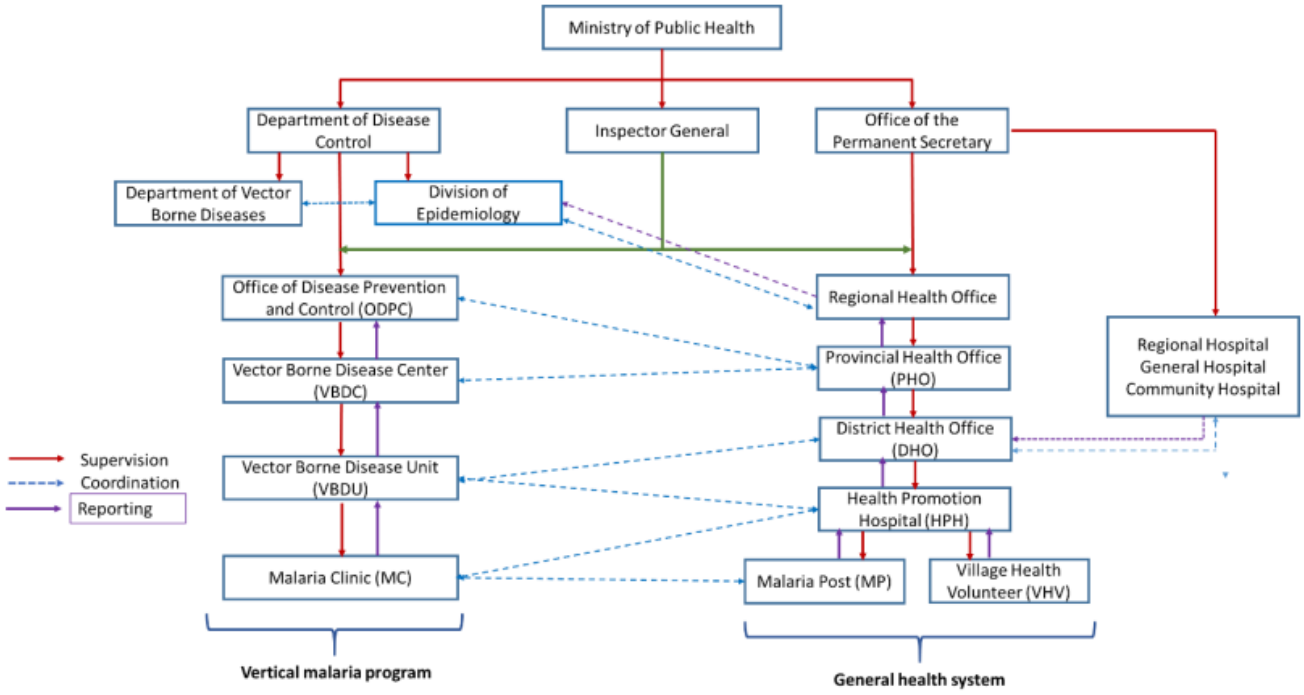
COUNTRY HEALTH SYSTEM

The Thai Malaria Control Program was a vertical program from its inception in 1949 until 1996 when it was partially merged with other vector-borne disease programs (dengue fever and filariasis). Now called the Division of Vector-Borne Diseases (DVBD), it is housed within the Department of Disease Control in the Ministry of Public Health (Figure 3). The DVBD is responsible for program management of malaria-related activities, generating policy for malaria control and elimination, and evaluating the program. At the regional level, the organization consists of 12 Offices of Disease Prevention and Control. Throughout the country, there are 39 Vector-borne Disease Centers at the provincial level and 301 Vector-borne Disease Units at the district level that are responsible for the prevention and control of malaria as well as other vector-borne diseases. There are currently 329 malaria clinics throughout the country. Additionally, village health volunteers (approximately 1.04 million throughout the country) under the primary health care division of the Ministry of Public Health are actively involved in prevention and control activities in every community. In addition, with support from the Global Fund to Fight AIDS, Tuberculosis and Malaria (Global Fund), an estimated 200–300 health volunteers were hired under nongovernmental organizations to work alongside village health volunteers with populations of people seeking refuge in Mae Sot, Ranong, and Phuket to conduct health prevention and control activities.

Malaria services are provided both by the vertical program through the DVBD's networks of malaria clinics and through general health service facilities at district and provincial hospitals. Past Global Fund support has boosted the role of the DVBD, which provides subgrants to provincial health offices to implement community-based services through malaria posts and border malaria posts, making the services easily accessible to migrants and free of charge. Health workers at malaria clinics use microscopes, while those at malaria posts use rapid diagnostic tests.

The DVBD manages and maintains its own "Malaria Online"' system for integrating various epidemiological and lab data from malaria service delivery points and civil society organizations into a single web-based platform. The DVBD is also currently looking to expand the use of mHealth tools to improve community-level timeliness of reporting and response.

Figure 3. Overview of the Structure and Management of the Malaria Program in Thailand



OTHER CONTEXTUAL INFORMATION

- The DVBD has been decentralizing and reducing malaria-specific funding and the number of specialized malaria officials. With this restructuring, health promotion hospitals, which are under General Health Services, are transitioning to provide malaria diagnosis with rapid diagnostic tests, to provide treatment, and to participate in conducting malaria case investigations, as appropriate. The challenge will be to make sure that these service delivery points have adequate technical and human resources for the appropriate management and follow up of malaria cases. Furthermore, the DVBD seeks to mobilize domestic funds and resources from entities such as local administration offices and subdistrict health boards to support activities related to the implementation of malaria elimination and prevention of reintroduction.

- In addition to the COVID-19 pandemic, the political coup in Burma has severely disrupted the provision of health services there since February 2021. Despite limited reports of malaria services still being provided through community-based organizations in Burma, the disruption of testing and treatment in the public and private sectors has resulted in a significant increase in malaria cases as well as test positivity rates along the Thailand–Burma border. Further, displaced people and refugees escaping violence are at increased risk of malaria infection. Restrictions on movement in some districts and provinces due to security concerns hamper the efforts of malaria teams to conduct active case detection and follow-up activities.

- Thailand is unlikely to achieve the national goal of zero indigenous *Plasmodium falciparum* by 2023 and all human species by 2024. The DVBD has been unable to adequately prepare for and respond to the influx of people seeking refuge along the Thailand–Burma border or ensure that sufficient commodities are available to prevent and manage malaria patients. As witnessed historically in other countries nearing elimination, malaria can and will resurge if given the opportunity in the form of political conflict, decreased funding, or other externality.

III. NATIONAL MALARIA PROGRAM STRATEGIC PLAN

Thailand's National Malaria Elimination Strategy (2017–2026), which calls for the elimination of all indigenous malaria cases by 2024, has the following objectives:

1. Reduce malaria morbidity to not more than 0.009/1,000 population by 2024.
2. Reduce malaria mortality to not more than 0.003/100,000 population by 2024.
3. Eliminate malaria transmission in all districts by 2024.
4. Prevent reintroduction of transmission in malaria-free areas.

Four strategies are aimed at the elimination goal and objectives: (1) scaling up malaria elimination activities in Thailand; (2) developing technology, innovation, measures, and models appropriate for malaria elimination; (3) developing partnerships among stakeholders at the national and international level to enable malaria elimination; and (4) promoting/empowering the community to take an active role in malaria prevention. To this end, the DVBD is undertaking the development of a robust and integrated surveillance system that can rapidly and efficiently respond to the malaria situation; increasing capacity and coverage of services in diagnosis and treatment at all levels and sectors and—based on the principle of equity—for all populations at risk of malaria; scaling up the detection of symptomatic and asymptomatic malaria patients, including submicroscopic parasitemia cases; scaling up coverage of prevention of malaria transmission through vector surveillance, vector control, and personal protection among populations; and developing a system to follow up on every malaria case to ensure cure and elimination of drug-resistant malaria parasites. PMI supports the DVBD's goals and objectives by bolstering malaria programming at the national and subnational level, using strategic information systems, providing limited commodity support and technical assistance for improved surveillance and response, and strengthening pharmaceutical capacity and management systems.

The national elimination strategy utilizes the district as the unit of analysis for malaria elimination. The DVBD plans to focus its resources and strategy on the identification of and response to the remaining active and nonactive residual foci in the country.

Although PMI is able to provide limited support for the procurement of malaria commodities to fill national gaps, the Global Fund RAI3E (2020–2023) supports the majority of Thailand's malaria commodity needs, including rapid diagnostic tests, artemisinin-based combination therapies, and insecticide-treated bed nets (ITNs). The RAI3E malaria grant also supports the delivery of diagnostics and case management services through malaria health posts and the engagement of civil society organizations to implement community mobilization and social behavior change activities in select communities and migrant and mobile populations. In light of the Global Fund support as well as Thailand's socioeconomic improvements over the past decade, PMI's support to Thailand has generally transitioned from malaria commodity procurement and distribution to an overall health systems strengthening (HSS) approach focused on expanding the role of malaria surveillance and response, improving existing supply chain management systems, and ensuring informed decision making based on evidence and strategic information at all levels. PMI's support in Thailand will shift toward supporting integration and increasing domestic resource mobilization and advocacy for malaria elimination at the national and subnational level while leveraging partnerships and resources from domestic local government sources, private and corporate sectors, and other nonhealth sectors. However, as seen with the current upsurge of populations at risk of malaria and malaria cases along the Thailand–Burma border due to the political conflict, Thailand still requires support for basic malaria commodities, including rapid diagnostic tests, antimalarial drugs, and long-lasting insecticidal nets.

A malaria program review (MPR) was conducted in Thailand in 2015. The program review planned for 2020 was delayed due to the COVID-19 pandemic. In late 2022, with technical support from WHO and cofunded by the Global Fund and USAID/PMI, Thailand conducted an external review that included key external evaluators, partners, and stakeholders, providing the following recommendations:

1. **High transmission areas—special package (for Tak Province and western border):** An effective and coordinated approach is urgently needed to contain malaria outbreaks in epidemic-prone areas in the provinces along the western border. A preparedness and response plan should be prepared and implemented before the next peak transmission period in 2023, transitioning from routine to proactive approaches to address the impending threat from the situation in the neighboring country and to support the overall malaria elimination effort.

2. **Low transmission areas—acceleration toward the elimination and interruption of local transmission (lessons from Yala Province):** The DVBD must increase vigilance on *P. falciparum* foci management, e.g., 100 percent 1-3-7 performance and prompt implementation of innovative strategies to interrupt its transmission by 2023. The DVBD should scale up good practices and expand them to other provinces, such as the excellent collaboration in Yala with border police, the army, civil society organizations, and communities to eliminate and prevent malaria.

3. **Prevention of re-establishment:** The DVBD should finalize and the Ministry of Public Health should endorse a fully functional national program to prevent the re-establishment of indigenous transmission throughout the country. The program should include provincial stratification according to malariogenic (receptivity/importation risk) potential. The DVBD must ensure all provinces have and implement a prevention of re-establishment plan based on the national guidelines. Such a plan is essential to subnational verification and eventual national certification.

4. **Integration and sustainability:** A clear integration policy is needed that includes timelines, implementation guidance, the roles and responsibilities of relevant agencies for Office of Disease Control and Prevention, vector-borne, general health services, and subdistrict administrative organization agencies.

5. ***Plasmodium knowlesi:*** While the elimination of zoonotic malaria is not included in the scope of the WHO's human malaria elimination certification scheme, the increasing trend of human cases of *P. knowlesi* malaria could threaten the malaria elimination initiative in Thailand, which experienced a fourfold increase—from 31 cases in 2018 to 140 cases in 2022. Ranong, Songkhla, Chumphon, Trat, and Satun provinces have experienced the highest number of cases.

6. **Program management:** The National Communicable Disease Committee and the Provincial Communicable Disease Committee should include malaria elimination in their remit for progress monitoring and guidance.

7. **Critical elements for the elimination and prevention of re-establishment:** Case-based surveillance and foci monitoring should be intensified and timely detection of and response to every case ensured; sufficient funding should be available to procure additional quantities of antimalarials to prepare the country for unforeseen outbreaks; and the national reference laboratory should be strengthened.

IV. KEY MALARIA DATA

EVOLUTION OF KEY SURVEY-BASED MALARIA INDICATORS

Table 3. Key Survey Indicators

Indicator	2012, TMS	2015, KAP	2017, MMP	2021, TMS
% of households (respondents) with any nets	90	90	94	74
% of households (respondents) with at least one ITN	47	51	39	30
% of children under five years of age who slept under an ITN the previous night	33	56	N/A	N/A
% of pregnant women who slept under an ITN the previous night	36	N/A	N/A	N/A
% of forest-goers who slept under an ITN the previous night	26	N/A	13	7
% of population (respondents) that slept under an ITN the previous night	29	39	N/A	37

ITN: insecticide-treated bed net; KAP: Knowledge, Attitude, and Practice; MMP: Mobile and Migrant Population Survey; TMS: Thailand Malaria Survey.
Note: Thailand plans to conduct a Thailand Malaria Survey in 2023.

Table 4. Evolution of Key Malaria Indicators Reported through Routine Surveillance Systems

Indicator	FY 2019	FY 2020	FY 2021	FY 2022
# of patients receiving a diagnostic test for malaria	929,229	795,615	636,319	666,797
Total # of confirmed malaria cases	5,859	4,424	2,898	8,497
Test positivity rate (%)	0.63	0.56	0.46	1.27
# (%) of malaria cases, children under the age of five	315 (5.4)	260 (5.9)	158 (5.5)	456 (5.4)
# (%) of malaria cases, ages 5–14	1,324 (22.6)	1,064 (24.1)	732 (25.3)	1,964 (23.1)
# (%) of malaria cases, ages 15–24	1,269 (21.7)	938 (21.2)	606 (20.9)	2,273 (26.7)
# (%) of malaria cases, ages 25–44	1,686 (28.8)	1,263 (28.5)	880 (30.4)	2,409 (28.3)
Total # of severe cases	67	31	16	5
Total # of malaria deaths	13	4	6 (1 *P. knowlesi*)	4

Table 5. Disaggregated Community-Level Data

Indicator	FY 2019	FY 2020	FY 2021	FY 2022
# of patients receiving diagnostic test for malaria from a CHW	58,569	59,724	57,812	52,229
Total # of malaria cases reported by CHWs[1]	752	948	673	1,852
% of CHW-reported cases (among total malaria cases)[2]	13.8	24.0	20.9	21.8

CHW: community health worker.

[1] Includes all ages, confirmed cases reported by malaria posts and border malaria posts.

[2] Total number of malaria cases reported by CHWs/total number of malaria cases in the previous table.

Table 6. Elimination Context: Policy and Scope

Malaria Policy and Implementation	Response		
1. Is malaria elimination part of the current malaria strategy?	Yes		
2. Are individual malaria cases investigated? *If yes, please note whether this occurs nationally or subnationally.*	Yes, nationally 85% of cases investigated (FY 2022)		
3. Are foci investigated? *If yes, please note whether this occurs nationally or subnationally.*	Yes, nationally 76% of foci investigated (FY 2022)		
Elimination Scope	**FY 2020**	**FY 2021**	**FY 2022**
4. Total # of districts in the country (admin 2)	928	928	928
5. # (%) of districts that have been verified as having eliminated malaria?[1]	798 (86)	813 (88)	809 (87)
6. Among districts **not** verified as having eliminated malaria, how many districts are targeted for elimination efforts?	130	115	119
6A. Among districts targeted for elimination efforts, how many have **active elimination activities**?[2]	130	115	119

[1] Malaria elimination is the interruption of local transmission, i.e., no local malaria cases for three years. This only refers to subnational verification led by national malaria programs. It is not referring to "elimination certification," which can only be granted by WHO for an entire country.

[2] Elimination activities include but are not limited to reactive insecticide-treated bed nets and/or indoor residual spraying, reactive case detection, reactive or focal drug administration, procurement and/or strategies for single dose primaquine for *P. falciparum* or radical cure primaquine for *P. vivax*, social behavior change for hard to reach or migrant populations, case investigation, foci classification, etc.).

V. Other Implementation Information

Table 7. Summary of Integrated Drug Efficacy Surveillance (2020–2022)

Year	Site	Number	Treatment Arm(s)	Efficacy (PCR-corrected adequate clinical and parasitological result) for Each Drug at Each Site
2020	iDES for Pf	167	DHA-PIP + PQ	Overall efficacy: 98% Sisaket and Ubon Ratchathani reported three Pf cases, which were treated with Pyramax
	iDES for Pv	2,448	CQ + PQ	Overall efficacy: 97.1% Sisaket: 70%
2021	iDES for Pf	35	DHA-PIP + PQ	Overall efficacy: 94.3% Sisaket and Ubon Ratchathani reported zero Pf cases
	iDES for Pv	1,970	CQ + PQ	Overall efficacy: 97.4% Sisaket: 87.5%
2022	iDES for Pf	73	DHA-PIP + PQ	Overall efficacy: 97.4% (95% CI 96.5–98.1) Sisaket: 87.5% (95% CI 38.7–98.1), with one failure among 18 cases
	iDES for Pv	4,088	CQ + PQ	Overall efficacy: 95.8%

CQ: chloroquine; DHA-PIP: dDihydroartemisinin-piperaquine; iDES: integrated drug efficacy surveillance; Pf: *Plasmodium falciparum*; PQ: primaquine; Pv: *Plasmodium vivax*.

The Ninth Meeting of the Greater Mekong Subregion Therapeutic Efficacy Study Network took place virtually on September 15–16, 2021. A meeting report with conclusions and recommendations is available here.

VI. Key Policies

Table 8. Policies in Thailand

Twenty-Year National Strategic Plan for Public Health (2017–2036)
National Malaria Elimination Strategy (2017–2026)
National eHealth Strategy (2017–2026)
National Vector Surveillance Guidelines
Standard Operating Procedures for Malaria Case Follow Up in Thailand (2019)
Manual for Malaria Elimination for public health officers at district and sub-district levels (CDCU/SRRT) (2019) **Guide to Malaria Elimination for Thailand's Local Administrative Organizations and the Health Network** (2019)
Guidelines for the Treatment of Uncomplicated Malaria for Public Health Personnel (2021)
Guidelines for Clinical Management of Malaria for Doctors Thailand (2021)

What is/are the first-line treatment(s) for uncomplicated *P. falciparum* malaria?	DHA-PIP daily for three days + PQ 30 mg for one day Sisaket and Ubon Provinces: Artesunate-pyronaridine for three days + PQ 30 mg for one day
What is/are the second-line treatment(s) for uncomplicated *P. falciparum* malaria?	● Artesunate-pyronaridine for three days + PQ 30 mg for one day ● Artemether-lumefantrine for three days + PQ 30 mg for one day ● Artesunate + mefloquine for three days + PQ for one day ● Quinine + clindamycin/doxycycline/ tetracycline for seven days + PQ 30 mg for one day ● Atovaquone-proguanil for three days + PQ for one day + PQ 30 mg for one day
What is/are the first-line treatment(s) for uncomplicated *P. vivax* malaria?	Chloroquine daily for 3 days + PQ (0.25 mg/kg) daily for 14 days
What is the first-line treatment for severe malaria?	Parenteral artesunate (IV) as bolus dose is given for at least 24 hours before oral medication is administered or if parenteral artesunate is not available, IV quinine drip is given for minimum 2–4 hours during the first 24 hours before oral medication is administered.
In pregnancy, what is the current first-line treatment for uncomplicated *P. falciparum* malaria in the **first trimester**?	Quinine + clindamycin for seven days (The DVBD is planning to update treatment guidelines by early 2024 to include the use of DHA-PIP in the first trimester.)
Given the WHO policy change to recommend AL as treatment for uncomplicated malaria in the first trimester, does the ministry of health plan to update the policy on treatment of malaria in the first trimester of pregnancy? And if so, what is the status of this policy change and implementation of the new policy? (Include plans for training providers on the new policy)	No, AL is not used in Thailand; DHA-PIP will be the first-line treatment for uncomplicated malaria during the first trimester.
In pregnancy, what is/are the first-line treatment(s) for uncomplicated *P. falciparum* malaria in the **second and third trimesters**?	DHA-PIP for three days
What is/are the first-line treatment(s) for *P. vivax* malaria in pregnancy?	Chloroquine for three days
In pregnancy, what is the first-line treatment for severe malaria?	IV artesunate
Is prereferral treatment of severe disease recommended at peripheral health facilities? If so, with what drug(s)?	IV loading dose of artesunate or quinine
Is prereferral treatment of severe disease with rectal artesunate recommended for CHWs?	N/A
Community Health Policy 1978–2014	
How many CHWs are currently providing iCCM?	N/A

What is the country's target for the # of CHWs providing iCCM?	N/A
What % of the country's target is met?	N/A
Does the country have a policy that enables the routine, regular payment of salaries/stipends for CHWs?	Yes
Do CHWs have the authority to test and treat all ages for malaria?	Supported by the Global Fund, CHWs at approximately 400 malaria posts in high-risk areas are able to test and treat. However, village health volunteers are only able to refer suspected malaria cases to the nearest malaria service delivery point.
Prevention of Malaria in Pregnancy Policy	
At what gestational age is the first dose of IPTp-SP to be given to pregnant women according to the national guidelines for malaria and MCH?	IPTp is not implemented in Thailand.
Do the national ANC guidelines reflect the WHO 2016 recommendation of eight ANC scheduled contacts (plus one additional contact for early initiation of IPTp at 13–16 weeks)? If not, how many ANC contacts are recommended?	ANC guidelines recommend 5 ANC visits with the first visit taking place between 5–12 weeks. The scheduled visits are: First visit = 5–12 weeks Second visit = 13–18 weeks Third visit = 19–26 weeks Fourth visit = 27–32 weeks Fifth visit = 33–38 weeks
What is the status of training ANC providers on the WHO recommended 8+ contacts?	N/A
Have HMIS/DHIS2 and ANC registers been updated to include eight or more contacts?	N/A
Are IPTp data collected as single months where the January 2022 data represent the number of doses administered in January 2022, or cohort data, representing the cumulative data from pregnancies which began six months prior?	IPTp is not implemented in Thailand
Is ANC/IPTp provided by facility staff conducting ANC outreach to communities?	IPTp is not implemented in Thailand.
Can CHWs deliver IPTp and, if so, which specific cadres and beginning with which dose? How many districts are targeted for c-IPTp implementation?	IPTp is not implemented in Thailand.

AL: artemether and lumefantrine; ANC: antenatal care; DHA-PIP: dihydroartemisinin-piperaquine; DHIS2: District Health Information System-2; HMIS: health management information system; iCMM: integrated community case management; iPTf: intermittent preventive treatment for forest goers; IPTp: intermittent preventive treatment for pregnant women; MCH: mean corpuscular hemoglobin; PQ: primaquine; SP: sulfadoxine-pyrimethamine.

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VII. PARTNER LANDSCAPE

Table 9. Partner Landscape

Partner	Key Technical Interventions	Geographic Coverage	Funding Amount or In-kind Contribution	Time Frame
Global Fund	● Case management, follow-up, surveillance, distribution costs of PMI-procured, long-lasting insecticidal nets	43 malaria endemic provinces	$22 million (RAI3E)	January 2021–December 2023
	● Commodities, including rapid diagnostic tests, artemisinin-based combination therapies, and long-lasting insecticidal hammocks	Focus on 32 active transmission provinces	$15.4 million (RAI4E)	January 2024–December 2026
Bill & Melinda Gates Foundation	● Genetic surveillance ● Integration and prevention of reintroduction ● Transition planning	N/A	N/A	November 2018–January 2024
Domestic	● Human resources, antimalarial drugs ● Insecticides for spraying, net retreatment	Nationwide; prevention of re-establishment activities in six provinces that have reverted	11,138,944	2022