PMI | U.S. PRESIDENT'S MALARIA INITIATIVE

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CDC

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TANZANIA (MAINLAND) 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 27 countries in sub-Saharan Africa and three programs across the Greater Mekong Subregion in Southeast Asia to control and eliminate malaria. Mainland Tanzania began implementation as a PMI partner country in FY 2006. See the Tanzania (Mainland) Malaria Operational Plan for more information on PMI's approach and investments.

II. CONTEXT

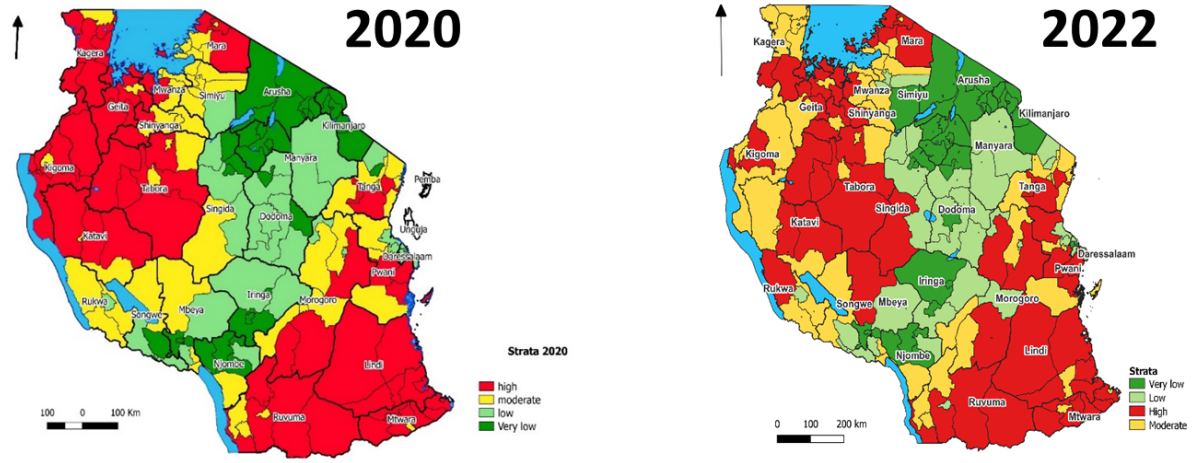
Table 1. General Demographics and Malaria Situation

Population	59,851,347 (National Bureau of Statistics 2022)
Population at risk of malaria	100% (World Health Organization [WHO])
Malaria prevalence	8.1% (Tanzania Demographic and Health Survey and Malaria Indicator Survey [TDHS-MIS] 2022) Prevalence on the mainland varies by region from <1% in the highlands of Arusha to 15% in the Southern Zone and as high as 24% along the Lake and Western zones.
Malaria incidence/1,000 population at risk	120.2/1,000 (WHO 2020)
Peak malaria transmission	The north and east experience two rainy seasons, October–December and March–May, while the central, southern, and western regions have one longer wet season, October–April/May. Rainy seasons correspond to periods of high malaria transmission.

STRATIFICATION

Periodic nationwide stratification exercises began in 2017. The following malaria indicators are used to conduct each stratification: (1) parasite prevalence in school children from school surveys; (2) fever test positivity rate; (3) annual parasite incidence; (4) confirmed malaria incidence; and (5) malaria test positivity rate in pregnant women. These indicators are categorized, assigned a score corresponding to the strata defined by the National Malaria Control Program (NMCP), and summed to produce an overall score across indicator categories. NMCP defines strata corresponding to malaria risk as very low (*Plasmodium falciparum* parasite rate *[pfpr]* <1 percent), low (*pfpr* 1 <5 percent), moderate (*pfpr* 5 <30 percent), and high (*pfpr* >30%). In addition to these four epidemiological strata, urban councils were considered as a separate, nonepidemiological stratum with specific operational and intervention needs. NMCP tailors intervention packages and sets targets for each stratum. The targets are: to reduce the malaria burden in moderate- to high-risk strata from 15 percent *pfpr* in 2017 to less than 7.5 percent *pfpr* in 2025 and to maintain and further reduce transmission in low- and very-low-risk strata in areas targeting elimination from 1 percent *pfpr* in 2017 to less than 0.5 percent *pfpr* in 2025.

Figure 1. Malaria Macrostratification Maps by Council Level in Tanzania, 2020 and 2022



Stratum	Epi strata		Epi + non epi strata	
	2020	2022	2020	2022
Very Low	36	38	31	28
Low	32	32	22	27
Moderate	52	57	45	49
High	64	57	61	55
Urban	0	0	25	25
Total	184	184	184	184

Figure 2. Malaria Prevalence Map by Regional Level in Tanzania, 2022

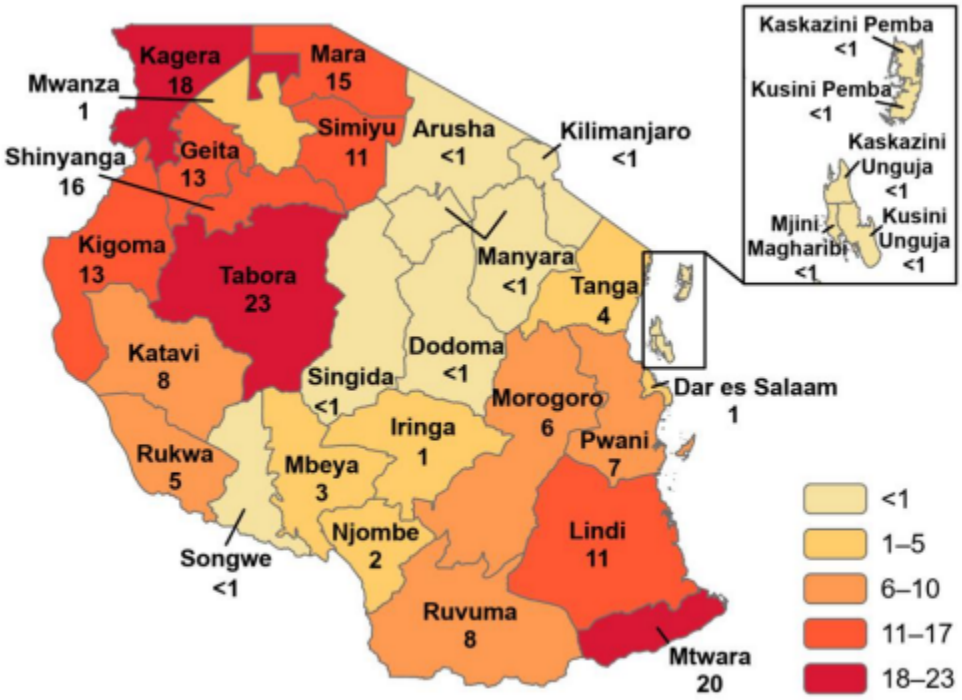


Figure 3. Malaria Incidence Map by Council Level in Tanzania, 2021

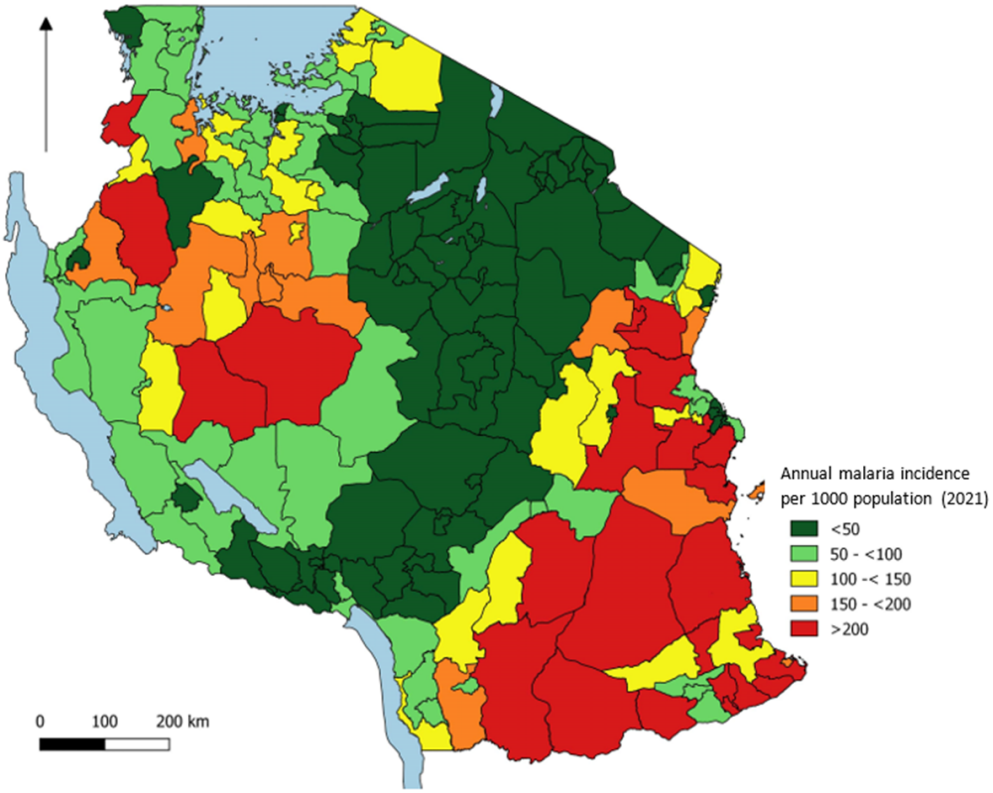


Table 2. Malaria Parasites and Vectors in Tanzania

Principal malaria parasites	*Plasmodium falciparum* (NMCP, 2021)
Principal malaria vectors[1]	Around the Lake Zone of mainland Tanzania, *Anopheles funestus* s.s is the most abundant vector and *An. arabiensis* is the second most abundant vector, followed by *An. gambiae s.s* and *An. parensis*. (National Institute for Medical Research, 2022)

[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

Mainland Tanzania is divided into two main administrative levels: regional and council. There are currently 26 regions and 184 councils. The councils are organized according to population settings, with district councils mainly in rural settings and town, municipal, and city councils mainly in urban settings. Each council is divided into four or five divisions; and each division is divided into three or four wards. Five to seven villages form a ward. The council is the most important administrative and implementation authority for public services, including for policies of the Ministry of Health (MOH) and, consequently, those of NMCP.

Tanzania's National Health System is based on a central-district government structure. The MOH and the President's Office–Regional Administration and Local Government (PO-RALG) are jointly responsible for the delivery of public health services. The central MOH is responsible for policy formulation, development of guidelines to facilitate policy implementation, and monitoring of policies and implementation guidelines. The MOH is also responsible for direct implementation of national, zonal, and regional referral hospitals. Regional health management teams interpret these policies and monitor their implementation in the councils they supervise. The regional medical officer heads the teams and reports directly to the MOH on issues related to medical management, and to PO-RALG through the regional administration secretary on issues related to health administration and management. The council health management team is responsible for council health services, including dispensaries, health centers, and hospitals. The team follows guidelines for planning and management of district health, which are issued jointly by the MOH and PO-RALG. The district medical officer heads the council health management team, is in charge of all council health services, is accountable to the council executive director regarding administrative and managerial matters, and reports to the regional medical officer on technical matters.

There are 10,269 registered and functional health care facilities in Tanzania, including hospitals, health centers, and dispensaries. Public health services are delivered through government facilities, nonprofit voluntary agencies, and parastatal health care facilities. The health care system in Tanzania is based on a hierarchical system represented by administrative level, type, and function of facility. The system includes a referral structure from primary health care to the tertiary level. A dispensary serves a population of 6,000–10,000, a health center serves 50,000–80,000, and a district hospital serves more than 250,000. A

regional hospital serves as a referral center to four to eight district hospitals, and four consultant (zonal) hospitals serve as referral centers for several regional hospitals. National hospitals serve as referral centers for zonal and regional hospitals (Health Sector Strategic Plan 2021–2026).

Malaria diagnostic and treatment services are offered by 6,357 public institutions, 873 faith-based organizations, and 1,014 private health facilities, while an additional 14,000 pharmaceutical outlets offer malaria treatment options. Preventive therapies for pregnant women are delivered in over 7,000 reproductive, child health clinics. Approximately 40 percent of patients with fever seek treatment at private health facilities.

OTHER CONTEXTUAL INFORMATION

Tanzania hosts almost 400,000 refugees and asylum seekers, most of whom are refugees located at three camps in Kigoma region, with the majority of the refugee population comprising unaccompanied or separated children. Infectious diseases, including malaria, are the leading causes of morbidity and mortality at the camps.

III. NMCP STRATEGIC PLAN

Tanzania's National Malaria Strategic Plan 2021–2025 outlines a long-term vision of a society free from malaria. The mission articulated in the strategy is that all Tanzanians have equitable access to sustainable, quality, effective, safe, and affordable malaria preventive and curative services through efficient and collaborative partnership and community ownership. The national goal is to reduce the average malaria prevalence in children under five years of age (*Plasmodium falciparum* parasite rate [*pfpr*]) from 7 percent in 2017 to less than 3.5 percent in 2025. Further, there are targets for each of the epidemiological strata, identified in a nationwide stratification exercise conducted in 2017.

The strategy to achieve these targets consists of six components—the first three are core strategies (1) Integrated malaria vector control; (2) malaria diagnosis, treatment, and preventative therapies; and (3) surveillance monitoring and evaluation; and the and the last three are support strategies: (4) commodities and logistics management; (5) social and behavior change and advocacy; and (6) program management. Each strategic component has specific objectives and outcomes, with specific intervention packages that vary by epidemiologic stratum.

IV. KEY MALARIA DATA

EVOLUTION OF KEY SURVEY-BASED MALARIA INDICATORS

Table 3. Key Survey Indicators in Tanzania

Indicator	2004–2005 DHS	2010 DHS	2015–2016 DHS-MIS	2017 MIS	2022 TDHS-MIS
% of households with at least one ITN	23	63	65	78	67
% of households with at least one ITN for every two people	N/A	N/A	39	42	35
% of population with access to an ITN	N/A	N/A	56	53	53
% of population that slept under an ITN the previous night	N/A	45	49	52	53
% of children under five years of age who slept under an ITN the previous night	16	64	54	54	59
% of pregnant women who slept under an ITN the previous night	15	57	54	51	58
% of children under five years of age with a fever in the last two weeks for whom advice or treatment was sought	N/A	65	80	75	78
% of children under five years of age with a fever in the last two weeks who had a finger or heel stick	N/A	N/A	36	43	51
% of children receiving an ACT among children under five years of age with a fever in the last two weeks who received any antimalarial drug	N/A	N/A	N/A	89	95
% of women who attended four ANC visits during their last pregnancy	61	43	51	N/A	65
% of women who received two or more doses of IPTp during their last pregnancy in the last two years	22	27	35	57	60
% of women who received three or more doses of IPTp during their last pregnancy in the last two years	N/A	N/A	8	26	33
Under five mortality rate per 1,000 live births	133	93	79	N/A	43
% of children under five years of age with parasitemia by microscopy	N/A	N/A	6	N/A	N/A
% of children under five years of age with parasitemia by rapid diagnostic test	N/A	N/A	15	8	8

* Indicator not measured; ACT: artemisinin-based combination therapy; ANC: antenatal care; DHS: Demographic and Health Survey; IPTp: intermittent preventive treatment for pregnant women; ITN: insecticide-treated bed net; MIS: Malaria Indicator Survey; TDHS: Tanzania Demographic and Health Survey and Malaria Indicator Survey.

Figure 4. Tanzania Insecticide-Treated Net Use-to-Access Ratio Map, 2017

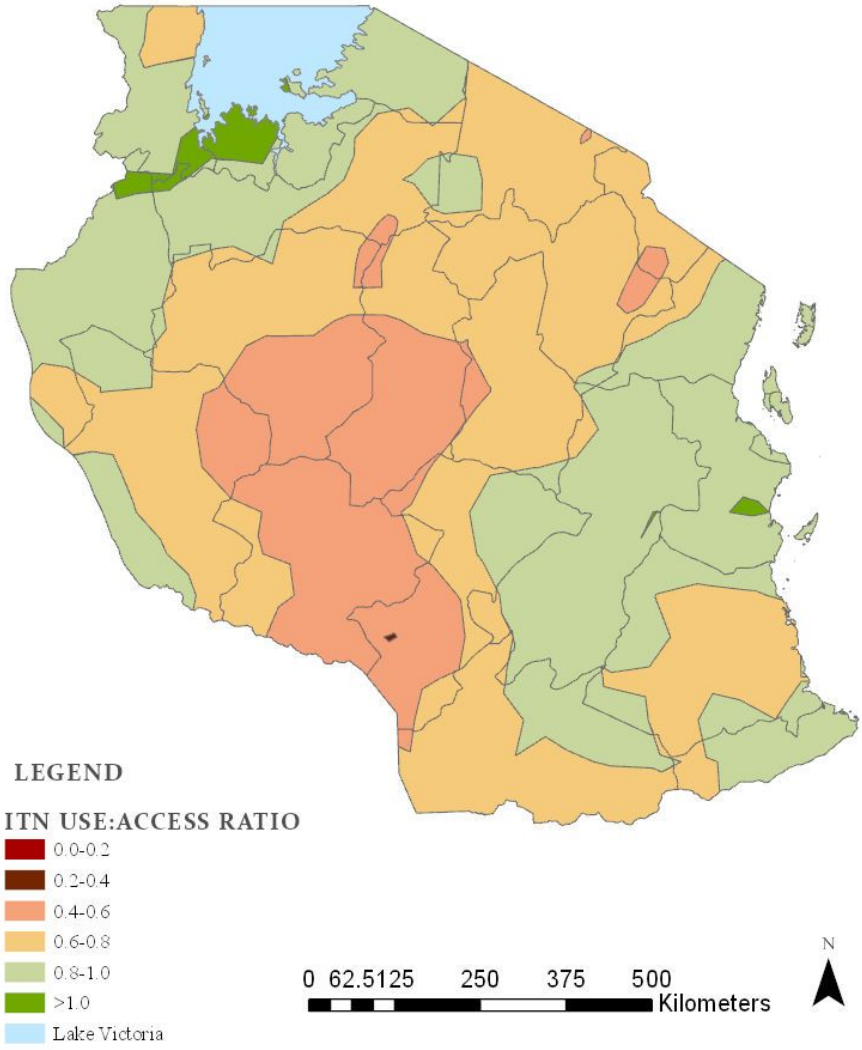


Table 4. Evolution of Key Malaria Indicators Reported through Routine Surveillance Systems in Tanzania

Community-level data are not integrated into the broader Health Management Information System (HMIS); these numbers only include facility-level data.

Indicator	2018	2019	2020	2021	2022
# of all-cause patient consultations	44,880,013	47,267,309	43,330,837	41,475,952	41,601,528
# of suspect malaria cases[1]	N/A	N/A	N/A	N/A	N/A
# of patients receiving diagnostic test for malaria[2]	22,275,989	24,394,153	21,958,066	20,259,970	18,617,171
Total # of malaria cases[3]	6,547,499	7,096,018	6,311,437	4,616,284	3,531,006
# of confirmed cases[4]	6,438,519	6,980,683	6,267,344	4,601,863	3,524,260
# of presumed cases[5]	108,980	115,335	44,093	14,421	6,746
% of malaria cases confirmed[6]	98.3%	98.4%	99.3%	99.7%	99.8%
Test positivity rate[7]	28.9%	28.6%	28.5%	22%	19%
Total # of malaria cases in children under five years of age [8]	2,464,013	2,968,782	2,793,863	2,046,150	1,654,449
% of cases in children under five years of age[9]	37.6%	41.8%	44.3%	44.5%	46.85%
Total # of severe cases[10]	324,747	335,250	311,640	213,379	177,767
Total # of malaria deaths[11]	2,541	2,110	2,414	1,864	1,664
# of facilities reporting[12]	8,505	8,709	9,022	9,022	8,677
% of data completeness[13]	99.5%	99.7%	99.8%	99.8%	99.2%

1 Number of patients presenting with signs or symptoms possibly due to malaria (e.g., fever), Tanzania does not capture fever or suspected malaria cases in HMIS/District Health Information System 2 (DHIS2); 2 Rapid diagnostic test or microscopy, all ages, outpatient and inpatient; 3 Total reported malaria cases; all ages, outpatient and inpatient, confirmed and unconfirmed cases; 4 Diagnostically confirmed; all ages, outpatient and inpatient; 5 Clinical/presumed/unconfirmed; all ages, outpatient and inpatient; 6 Number of confirmed cases divided by total number of cases; 7 Confirmed cases divided by number of patients receiving a diagnostic test for malaria (rapid diagnostic test or microscopy); 8 Outpatient and inpatient, confirmed and unconfirmed; 9 Total number of cases in children under five years of age divided by total number of cases; 10 Severe cases are defined in a patient with *P. falciparum* asexual parasitemia and no other obvious cause of symptoms, with the presence of one or more of the following clinical features: behavioral changes, prostration/extreme weakness, coma, respiratory distress, convulsions, vomiting everything, inability to drink or breast feed, circulatory collapse/shock, pulmonary edema, bleeding tendency/disseminated intravascular coagulation, jaundice, acute renal failure, and hemoglobinuria; 11 All ages, outpatient, inpatient, confirmed, and unconfirmed; 12 Total number of health facilities reporting data into the HMIS/DHIS2 system that year; 13 Number of monthly reports from health facilities divided by number of health facility reports expected (average for the calendar year).

V. OTHER IMPLEMENTATION INFORMATION

Results of Durability Monitoring

A previous study was conducted between 2013 and 2016 with other funding. The field durability monitoring of PBO nets to estimate the bioefficacy and physical damage of PBO nets compared with pyrethroid nets is ongoing, but initial results show that PBO nets meet WHO's bioefficacy thresholds for up to 24 months, but the durability under operational conditions is less than 24 months. Following the completion of this study, NMCP, PMI and other stakeholders will discuss the findings together.

PMI provides technical and financial support for TES conducted annually following the standard WHO protocol at eight sentinel sites (alternating four sites each year) in mainland Tanzania, including molecular testing of antimalarial resistance markers for first and second-line artemisinin-based combination therapies (ACTs).

Table 5. Summary of Completed Therapeutic Efficacy Studies (TES) in Tanzania

Year	Site	Treatment arm(s)	Efficacy (PCR-corrected adequate clinical and parasitological result) for each drug at each site
2019[1]	Tabora (Simbo)	Artemether-lumefantrine (AL)	100%
2019[1]	Mtwara (Nagaga)	AL	100%
2019[1]	Mwanza (Karume)	AL	98.5%
2019[1]	Mbeya (Ipinda)	AL	97.6%
2016[2]	Pwani (Kibaha)	AL	100%
2016[2]	Morogoro (Mlimba)	AL	100%
2016[2]	Tanga (Mkuzi)	AL	98.6%
2016[2]	Kigoma (Ujiji)	AL	98.4%
2014–2015[3]	Tanga (Muheza)	AL	100%
2014–2015[3]	Kigoma (Ujiji)	AL	97.4%
2014–2015[3]	Tanga (Muheza)	Dihydroartemisinin-piperaquine (DP)	97.0%
2014–2015[3]	Kigoma (Ujiji)	DP	99.1%

*Recrudescents was defined as a 6/6 match at six neutral microsatellites for this study, this is not a WHO-approved approach.
[1] United States Agency for International Development. (2020). *Efficacy and Safety of Artemether-Lumefantrine for the Treatment of Uncomplicated Falciparum Malaria: Mainland Tanzania*. U.S. President's Malaria Initiative. [2] Ishengoma et al. (2019). "Efficacy and safety of artemether-lumefantrine for the treatment of uncomplicated malaria and prevalence of Pfk1q3 and Pfmdr1 polymophisms after a decade of using artemisinin-based combination therapy in mainland Tanzania." *Malar J.* 18, 88. [3] Mandara et al. High efficacy of artemether-lumefantrine and dihydroartemisinin-piperaquine for the treatment of uncomplicated falciparum malaria in Muheza and Kigoma Districts, Tanzania. *Malar J.* 17, 261 (2018)

VI. KEY POLICIES

Table 6. Policies in Tanzania

Policy, operational, and guidance documents can be viewed and downloaded from the MOH health digital library.

Health Sector Strategic Plan (2021–2026)	
National Malaria Strategic Plan (2021–2025)	
National Operational Guideline For Community-Based Health Services (2021)	
National Guidelines For Malaria Diagnosis, Treatment And Preventive Therapies (2020)	
Monitoring and Evaluation Strategic Framework (2020–2025)	
Malaria Surveillance, Monitoring and Evaluation Plan (2021–2025)	
National Digital Health Strategy (2019–2024)	
Digital Health Investment Roadmap (2017–2023)	
Communication Guide For Malaria Control Interventions (2015–2020)	
National Pharmaceutical Action Plan	
National Strategy for Vector Control (2019–2024)	
National Guidelines For Integrated Malaria Vector Control (2016)	
What is/are the first-line treatment(s) for uncomplicated *P. falciparum* malaria*?	Artemether-lumefantrine
What is/are the second-line treatment(s) for uncomplicated *P. falciparum* malaria*?	Artesunate-amodiaquine (ASAQ) and dihydroartemisinin-piperaquine (DP)
What is/are the first-line treatment(s) for uncomplicated *P. vivax* malaria?	N/A
What is the first-line treatment for severe malaria?	Injectable artesunate
In pregnancy, what is the first-line treatment for uncomplicated *P. falciparum* malaria in the first trimester?	Artemether-lumefantrine
Given the WHO policy change to recommend AL as treatment for uncomplicated malaria in the first trimester, does the MOH plan to update the policy on treatment of MIP in the first trimester? And if so, what is the status of this policy change and implementation of the new policy? (Include any plans for training providers on the new policy.)	Tanzania has revised its malaria treatment guidelines in 2020, recommending the use of artemether-lumefantrine for the treatment of malaria in the first trimester of pregnancy. The treatment guidelines were disseminated, and orientation sessions were conducted nationwide by December 2021. Supportive supervision is ongoing to ensure adherence to the policy.

In pregnancy, what is/are the current first-line treatment(s) for uncomplicated *P. falciparum* malaria in the *second and third trimesters*?	Artemether-lumefantrine
What is/are the first-line treatment(s) for *P. vivax* malaria during pregnancy?	N/A
In pregnancy, what is the first-line treatment for severe malaria?	Injectable artesunate
Is prereferral treatment of severe disease recommended at peripheral health facilities? If so, with what drug(s)?	Yes, prereferral treatment of severe disease is recommended at peripheral health facilities. Injectable artesunate is the first-line treatment.
Is prereferral treatment of severe disease with rectal artesunate recommended for community health workers?	Prereferral treatment of severe disease with rectal artesunate is recommended but not currently implemented for CHWs providing iCCM.
Community Health Policy (National Operational Guideline for Community-Based Health Services) (2021)	
What is the # of CHWs currently providing iCCM?	Tanzania does not currently implement iCCM. CHWs are not authorized to diagnose and treat (see below). However, during pilot implementation of mCCM conducted by NMCP in 2022, 104 CORPs were trained in mCCM. Only 77 (74%) of the CORPs needed for pilot implementation in mCCM districts were recruited.
What is the country's target for the number of CHWs providing iCCM?	There are no national targets for CHWs providing iCCM. NMCP targets one CORP per eligible and selected village to implement mCCM.
What percent 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?	No, CHWs do not have the authority to test and treat malaria. Testing and treatment can be completed by CORPs, who require medical licensure. The scope of CHW's are limited to SBC activities related to health promotion.
Prevention of Malaria in Pregnancy Policy (National Guidelines For Malaria Diagnosis, Treatment And Preventive Therapies) (2020)	
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?	As early as possible in the second trimester (13 weeks gestational age).
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?	Yes, the 2018 ANC guidelines recommend eight contacts. Tanzania has early initiation of IPTp at 13–16 weeks.

What is the status of training ANC providers on the WHO recommended eight or more contacts?	USAID supported the MOH to review, update, and disseminate the updated ANC guidelines based on the WHO 2016 recommendations, including the eight ANC contacts.
Have HMIS/DHIS2 and ANC registers been updated to include eight or more contacts?	The HMIS/DHIS2 has not been updated. However, health facility registers capture eight contacts.
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?	Yes, the IPTp data are collected as a single month.
Is ANC/IPTp provided by facility staff conducting ANC outreach to communities?	No.
Can CHWs deliver IPTp and if so, which specific cadres and beginning with which dose?	No, there is not a community IPTp program.

AL: Artemether-lumefantrine; ANC: antenatal care; CHW: community health worker; CORPs: community-owned resource persons; DHIS2: District Health Information System 2; HMIS: health management information system; iCCM: integrated community case management; IPTp: intermittent preventive treatment for pregnant women; mCCM: malaria community case management; MCH: mean corpuscular hemoglobin; MIP: malaria in pregnancy; SP: sulfadoxine-pyrimethamine MOH: Ministry of Health; NMCP: National Malaria Control Program; WHO: World Health Organization.

VII. PARTNER LANDSCAPE

Table 7. Partner Landscape

Partner	Key Technical Interventions	Geographic Coverage	Funding Amount or In-Kind Contribution	Time Frame
Global Fund	• Procure and distribute ITNs via mass campaigns and continuous distribution through health facilities • Procure and distribute ACTs and RDTs • MSDQI implementation	• Non-PMI supported regions for ITN mass campaigns • Nationally for ITN continuous distribution • MSDQI implementation in non-PMI supported regions	$60.2 million	CY 2021–2023
Government of Tanzania	• Human resource • Infrastructure • Commodities procurement, supply chain	National	Unknown	
Swiss Development Corporation—Swiss Tropical Public Health Institute	• Support larval source management implementation and monitoring • Technical guidance on surveillance, monitoring, evaluation, and case management	• Larval source management in Tanga region • Technical guidance at the national level	$1.1 million	CY 2021–2025

ACT: artemisinin-based combination therapy; CY: calendar year; RDT: ITN: insecticide-treated net; rapid diagnostic test; MSDQI: Malaria Service and Data Quality Improvement.