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# ETHIOPIA 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. Ethiopia began implementation as a PMI partner country in Fiscal Year (FY) 2008. Please see the Ethiopia Malaria Operational Plan for more information on PMI's approach and investments.

## II. CONTEXT

Ethiopia is located in the Horn of Africa and borders six countries: Eritrea, Djibouti, Somalia, Kenya, South Sudan, and Sudan. The country has an area of 1.1 million square kilometers with altitude ranging from 4,620 meters above sea level at Ras Dashen Mountain to 148 meters below sea level at the Danakil (Dallol) Depression. More than half of the country lies above 1,500 meters.

According to the draft Ethiopian National Malaria Strategic Plan (NMSP) 2023–2026, the population of Ethiopia was 109.8 million in 2022, with 69 percent residing in areas at risk of malaria. Malaria transmission in Ethiopia is highly seasonal and unstable, with epidemic-prone patterns in many parts of the country. The highest malaria burden regions tend to have stable and intense malaria transmission at altitudes below 1,500 meters and temperatures between 24 and 30 degrees Celsius. These areas include the entire regions of Gambela and Benishangul-Gumuz; as well as western parts of Oromia; Amhara; South Nations, Nationalities, and Peoples; and Tigray.

Malaria remains one of the major public health and socioeconomic problems in Ethiopia, despite a dramatic reduction in the last two decades. In the past ten years, malaria cases dropped from 3.5 million to less than one million in 2019, while deaths dropped from 3,000 in 2010 to 212 in 2021. However, in 2022, the Ethiopian Federal Ministry of Health (FMOH) Annual Performance Report (FY 2022) revealed a 66 percent increase in malaria cases in 2022 compared to 2019 (904,495 in 2019 versus 1,504,405 cases in 2022).

According to the last Malaria Indicator Survey in 2015, the parasite prevalence in Ethiopia was .5 percent by microscopy and 1.2 percent by rapid diagnostic test (RDT) for areas below 2,000 meters and less than .1 percent prevalence above 2,000 meters. Data triangulation with previous Public Health Emergency Management and malaria micro planning reports indicate that more than 80 percent of the malaria burden in Ethiopia is among adults and children who are at least five years of age. *Plasmodium (P.) falciparum* (~65 percent) and *P. vivax* (~35 percent) are the major malaria parasites.

### Table 1: General Demographics and Malaria Situation

| | |
|---|---|
| **Population** | 109.8 million (Revised Ethiopia NMSP, 2023) |
| **Population at risk of malaria** | 75.7 million (Revised Ethiopia NMSP, 2023) |
| **Malaria prevalence** | .5 percent (Ethiopia National Malaria Indicator Survey, 2015) |
| **Malaria incidence/1,000 population at risk** | 29.4 (FMOH Annual Performance Report EFY 2014 (FY 2022) |
| **Peak malaria transmission** | September–December |

FMOH: Ethiopia Federal Ministry of Health; NMSP: National Malaria Survey Report.

## STRATIFICATION

In 2023, in response to the change in malaria epidemiology and unanticipated geopolitical challenges affecting malaria programming, the National Malaria Elimination Program (NMEP) decided to conduct a full malaria program review, despite having two years of implementation left in the NMSP 2021-2025. The review led to a revision of the NMSP and to the malaria risk stratification.

This new stratification analyzed ecological data for all of Ethiopia's 1,081 districts to determine their risk for malaria transmission and further triangulated this with epidemiological data at the subdistrict level. For ecological data, elevation (mean, median and majority) was extracted from Digital Elevation Models and climate variables (temperature, rainfall and normalized difference vegetation index) were extracted from remotely sensed satellite imagery data for each district. District populations were estimated based on the latest FMOH and Central Statistical Agency projections. As a result, districts were categorized into five strata: high risk, medium risk, low risk, very low risk, and malaria free areas (Figure 1a). In addition, annual malaria parasite incidence (API/1,000) was calculated for each kebele (administrative level 4) in each strata using District Health Information Software 2 (DHIS2). Subsequently, kebeles were divided into six categories within their respective strata, based on API: 1) kebeles with API of zero, 2) kebeles with API greater than zero but less or equal to one, 3) kebeles with API between one and five, 4) kebeles with API between five and ten, 5) kebeles with API between ten and fifty, 6) and kebeles with API above fifty.

It is envisioned that this kebele level stratification will ensure that the right interventions are targeted at the lowest administrative level, allowing them to intensify control efforts in high

transmission areas, while maintaining the gains achieved in low transmission areas (Figure 1b). Each stratum is described as follows:

**Stratum 1-Malaria Free Areas:** This stratum includes 153 districts and 2,388 kebeles that are highlands above 2500 meters elevation or greater than 2000 meters elevation with mean annual temperature less than 16 degrees Celsius. The mean annual rainfall in this area is 1,158 mm (range: 590-1,822 millimeters).

**Stratum 2-Very Low Risk Malaria Areas**: There are 263 districts with 4,609 kebeles in this stratum. Out of the 263 districts, 221 districts (84 percent) are highlands lying between 2001 and 2500 meters elevation, with mean annual temperature ranging from 16 to 20 degrees Celsius and mean annual rainfall of 1,120 millimeters (range: 526-1,800 millimeters). The remaining 42 districts in this stratum are located in eastern and southeastern semiarid/arid zones with less than 1,500 meters elevation and less than 500 millimeters of mean annual rainfall. In this category, transmission commonly occurs near water bodies.

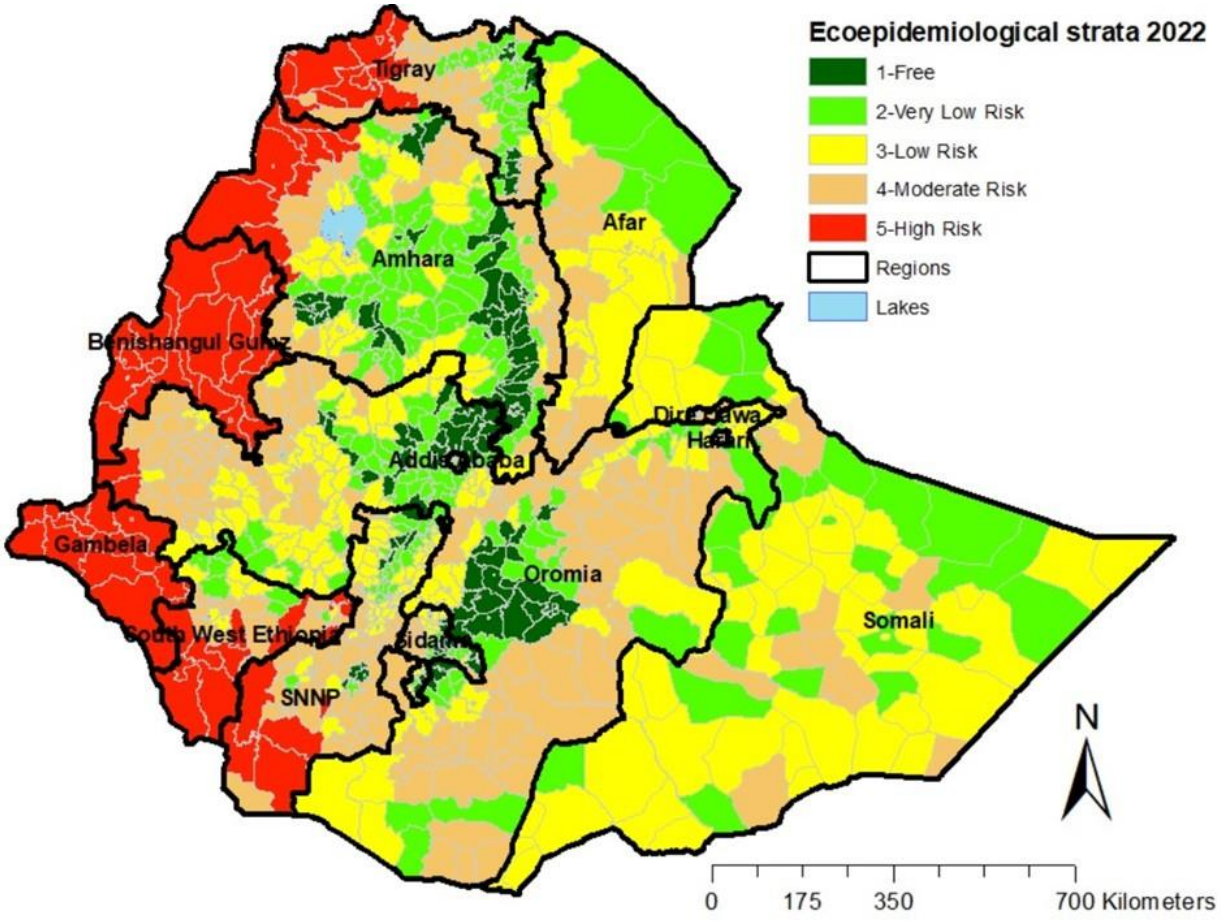
**Stratum 3-Low Risk Malaria Areas**: There are 285 districts with 5,342 kebeles in this stratum including 209 districts (73 percent) located between 1,751 meters and 2,000 meters elevation with mean temperature ranging from 16 to 20 degrees Celsius and mean annual rainfall of 1,219 millimeters (range 519-1,847 millimeters). The other 27 percent of the districts are located in semi-arid/arid zones which were at less than 1500 meters elevation with mean annual rainfall of less than 500 millimeters.

**Stratum 4-Moderate Risk Malaria Areas**: There are 296 districts with 5,095 kebeles in this stratum including 180 districts (61 percent) located in the midlands between 1,500 and 1,750 meters elevation with mean annual temperature of 18-24 degrees Celsius and mean annual rainfall of 1,122 millimeters (range: 500-1,196 millimeters). The remaining 118 districts in this stratum are located in eastern and southeastern semiarid/arid zones with rainfall between 500–1,500 millimeters.

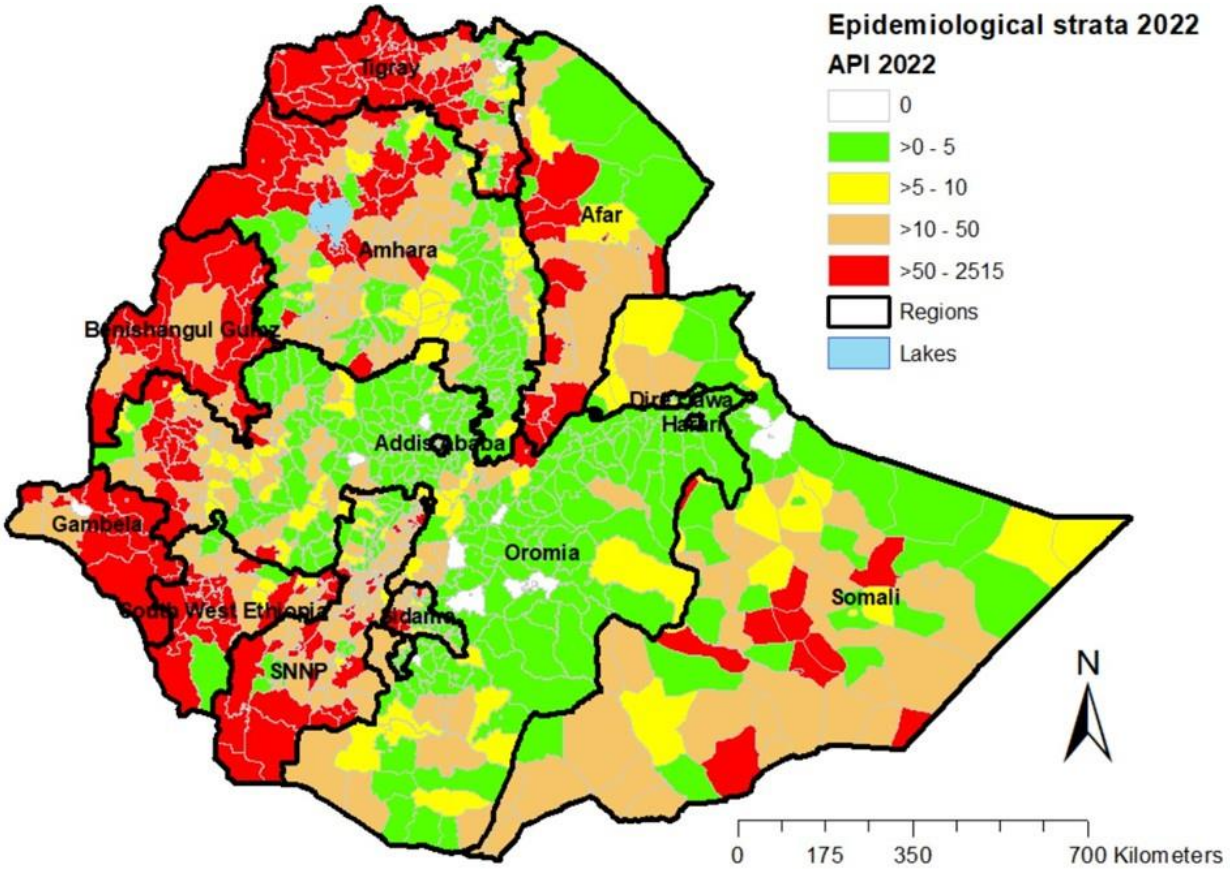
**Stratum 5-High Risk Malaria Areas**: There are 84 districts in this stratum, which are located in the western humid lowlands. Almost all of these districts have less than 1,500 meters elevation and more than 500 millimeters of annual mean rainfall. The annual temperature is usually above 24 degrees Celsius and relative humidity is greater than 60 percent.

## Figures 1a and 1b: Stratification and Mapping of Malaria Risk Using Environmental and Epidemiological Variables in 2023, Ethiopia

### 1a: Ecoepidemiological Strata 2022



## 1b: Epidemiological Strata 2022

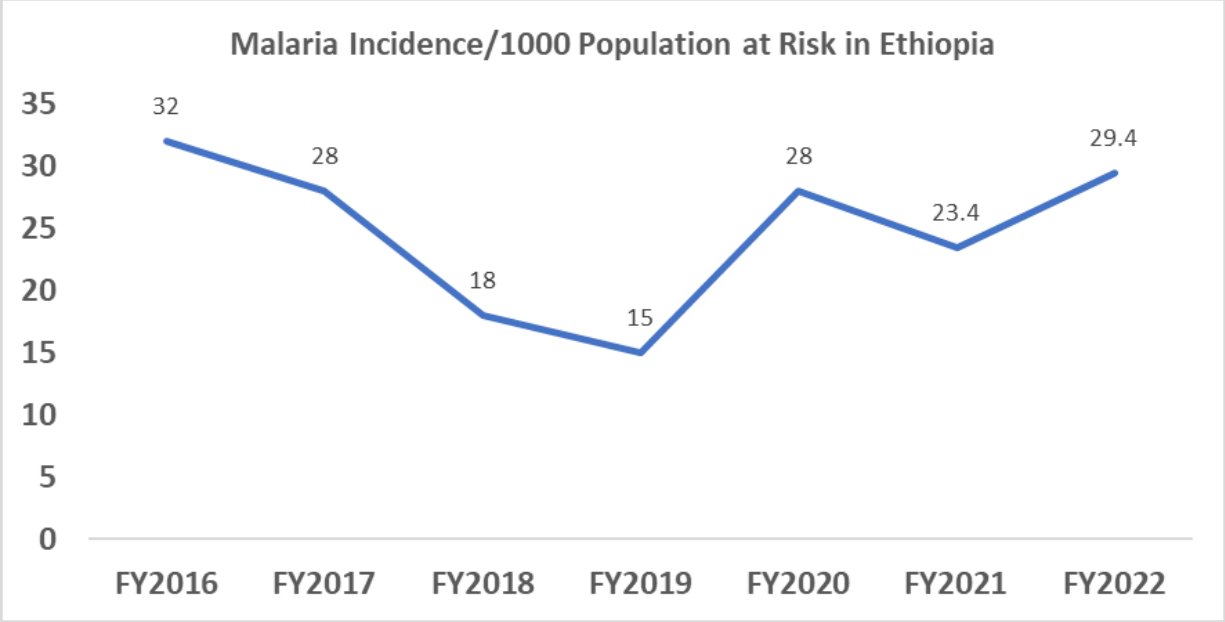


## Table 1: Malaria Stratification With Estimated Population Distribution, NMEP, 2023

| Strata | # of Districts | Total Popu-lation | At-risk Popu-lation | Number of Kebeles by API Categories and Strata | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | | API=0 | < or = 1 | >1-5 | >5-10 | >10-50 | >50 | Total |
| 1-Free | 153 | 15,986,449 | | 2,388 | | | | | | 2,388 |
| 2-Very Low Risk | 263 | 30,511,510 | 17,891,188 | 2,168 | 506 | 933 | 335 | 457 | 210 | 4,609 |
| 3-Low Risk | 285 | 32,251,849 | 26,816,512 | 1,286 | 441 | 1,270 | 562 | 1,220 | 563 | 5,342 |
| 4-Mod-erate Risk | 296 | 26,363,567 | 26,219,921 | 964 | 258 | 1,034 | 610 | 1,359 | 870 | 5,095 |
| 5-High Risk | 84 | 4,638,974 | 4,638,974 | 4 | 28 | 57 | 103 | 303 | 967 | 1,462 |
| Total | 1,081 | 109,752,349 | 75,566,595 | 6,810 | 1,233 | 3,294 | 1,610 | 3,339 | 2,610 | 18,896 |

NMEP: National Malaria Elimination Program.

## Figure 2. Trends in Malaria Incidence, Fiscal Year 2016-2022




## Table 2: Malaria Parasites and Vectors

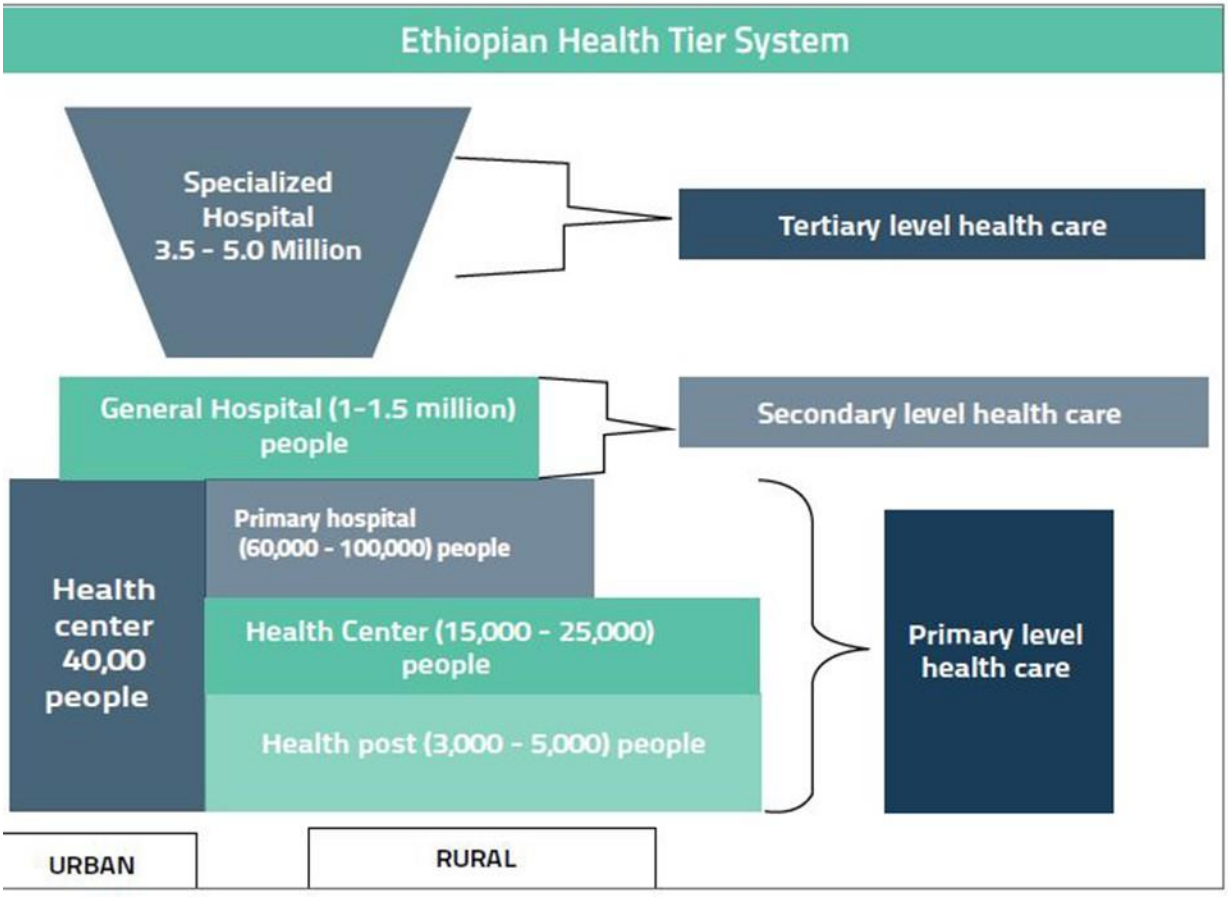
| | |
|---|---|
| **Principal Malaria Parasites** | 1. *Plasmodium falciparum* (65%) and<br>2. *Plasmodium vivax* (35%) (NMSP 2021) |
| **Principal Malaria Vectors*** | 1. *Anopheles arabiensis* (NMSP 2021)<br>2. *Anopheles funestus*<br>3. *Anopheles pharoensis*<br>4. *Anopheles nili*<br>5. *Anopheles stephensi* (emerging vector) |

*See Entomological Monitoring section of the MOP for more details on vector bionomics and insecticide resistance and Indoor Residual Spraying section for details on residual efficacy.

## COUNTRY HEALTH SYSTEM

Ethiopia is administratively divided into four levels: regions, zones, woredas (districts) and kebeles (administrative level 4). The country comprises 11 regions and two city administrations (Addis Ababa and Dire Dawa). Under these regions, there are a total of 128 zones, 1,081 woredas and 18,896 kebeles.The health system in Ethiopia is organized into three tiers: the primary health care unit consists of a network that includes a primary hospital, health centers, and health posts, which together serve between 100,000 and 500,000 people; the secondary care level consists of general hospitals with a catchment population of 1 to 1.5 million each; and the tertiary care level is composed of specialized hospitals, each serving has a catchment population of approximately 5 million people. The majority of public preventive, promotive, and basic curative health services are offered at the primary health care unit, where PMI support is focused.

**Figure 3: Schematic of Ethiopia's Three-tiered Public Medical Services**




The health extension program (HEP) was launched in 2003 in selected regions and was later tailored to all the regions in 2006 and to urban areas in 2009. The HEP is now the cornerstone of the Government's national program for delivering primary health care; improving pre-service education and in-service training; recruiting and deploying other health professional cadres; strengthening systems for essential commodities, medical equipment and supplies; and

increasing the availability and use of health information for evidence-based practices. Most of the achievements in Ethiopia in improving health outcomes during the past two decades were realized after the expansion of primary health care services to households and communities through the implementation of the HEP. A health post is managed by at least two health extension workers, while a health center has at least two health officers, four nurses, one laboratory technician, and one pharmacy personnel. In 2020, given the importance of the HEP framework for public health services, the FMOH developed a roadmap for optimizing the Ethiopian Health Extension Program 2020-2035.

In 2018, health worker density was estimated at 1 per 1,000 population, considerably lower than the 4.5 per 1,000 population standard proposed by the World Health Organization to achieve Universal Health Coverage. The inadequate skill mix of health professionals is another issue. There is a relatively high number of nurses but a shortage of medical doctors, midwives, anesthetists, pharmacists, and medical laboratory technologists. To address this, the FMOH and the Ministry of Education have committed to scaling up health professional training in public and private universities and colleges.

**Health Care Costs and Affordability**

According to the Health Sector Transformation Plan (HSTP-II), a number of measures were undertaken by 2015 to enhance health financing and improve the coverage and quality of health services. To mobilize resources for health and protect people from financial hardship, the government implemented several interventions including providing fee waivers for high-impact interventions through an exemption program, subsidizing more than 80 percent of healthcare costs in government health facilities, enacting community based health insurance (CBHI) schemes, and fully subsidizing costs for the very poor through fee waivers both for both health services and CBHI premiums.

According to the 8th National Health Account, 5.3 percent of the national health spending is consumed by malaria. The NMSP 2021-2025 states that malaria services, including diagnosis, treatment, insecticide-treated nets (ITNs) and indoor residual spraying (IRS), are all provided free of charge to the community. Most of the malaria costs are covered by donor funding including procurement of drugs, diagnostics, ITNs, and insecticides for IRS.

**Deployment of Rapid Diagnostic Tests and Microscopy**

In Ethiopia, multispecies RDTs that can detect *P. falciparum* and *P. vivax* are used at the health post level while microscopy is used at the health center and hospital levels to diagnose malaria. Microscopy is also recommended for use at medium and higher level private clinics. According to the Service Availability and Readiness Assessment-2018, 62 percent of health posts use RDTs, whereas 72 percent of health centers and 97 percent of hospitals use microscopy. Similarly, 97 percent of medium clinics and 58 percent of higher clinics use microscopy to diagnose malaria. Due to high rates of histidine rich protein 2/3 (HRP-2/3) gene deletions in

malaria parasites ranging from 5–30 percent, which render conventional RDTs less or unable to detect infections, Ethiopia is progressively shifting to procuring non-HRP2/3 based RDTs.

### Health Supply Chain and Pharmaceutical Management System

Malaria commodities in Ethiopia are primarily procured with PMI and Global Fund to Fight AIDS, Tuberculosis, and Malaria (Global Fund) resources. Upon arrival in the country, these commodities are warehoused and distributed through the Ethiopian Pharmaceutical Supply Service (EPSS) with significant financial support from donors. EPSS is led by the FMOH and is mandated to procure, warehouse, and distribute medicines and medical supplies destined for consumption at public health facilities. Together with donors and in-country stakeholders, EPSS strives to ensure consistent availability of malaria commodities at service-delivery points nationwide.

Annual malaria quantification exercises are led by EPSS in consultation with the NMEP, PMI, Global Fund, and other key in-country stakeholders with the final report informing PMI malaria operational planning, Global Fund grant writing, and in-country supply planning.

The supply chain and pharmaceutical management information flows through the Integrated Pharmaceutical Logistics System. Hospitals and health centers report and order malaria commodities every two months and EPSS delivers them directly from regional hubs to health facilities, or indirectly from regional hubs through Woreda Health Offices. Health posts collect health products from the health centers they report to monthly. These health centers use data in health post reports to calculate consumption and resupply quantities.

PMI has been supporting the roll out of an electronic logistics management information system, but at this stage it has been implemented in relatively few sites, with the vast majority of facilities reporting through a paper-based system. Based on this reporting, Ethiopia has seen a reduction in stockouts of artemisinin-based combination therapies (ACTs) and RDTs since the beginning of 2021, with both products having a stockout rate of less than 10 percent at health facilities. This year, RDTs reached the 5 percent stockout target set through PMI's stockout reduction strategy, but improvements in the reduction of ACT stockouts have been slower due to facilities not requesting a full resupply of artemether-lumefantrine when they have at least one other presentation available. Indeed, while there were stockouts of individual artemether-lumefantrine presentations, reports showed that Ethiopia's health facilities have consistently been able to treat patients with less than 1 percent reporting being stocked out of all artemether-lumefantrine presentations.

### Health Management Information System

The Health Information Systems (HIS) in Ethiopia are run under different authorities. The routine Health Management Information System, which uses the District Health Information Software 2 platform (HMIS/DHIS2) is managed primarily by the FMOH; population-based

survey information comes predominantly from the Central Statistical Agency; and the Ethiopian Public Health Institute is responsible for Public Health Emergency Management data, which has 36 priority diseases that are reportable weekly or immediately.

During the first Health Sector Transformation Plan period (2016–2020), the health sector worked toward enhancing evidence-based decision-making primarily through developing and implementing the Information Revolution Roadmap and model district strategy. At the end of the Health Sector Transformation Plan-I period, reporting completeness reached more than 89 percent. A total of 3,605 health, including 95 percent of public health facilities, are connected to DHIS2, which is used for the collection, storage, validation, analysis, and presentation of routine health data. Implementation of the Electronic Community Health Information System (eCHIS), which is envisioned to improve the performance of the health extension workers in Ethiopia, has started in selected health posts with a focus on elimination districts. This system captures basic health related information at household and individual level, including data on demographics as well as health service delivery and utilization based on the HEP package. The eCHIS malaria module includes elimination indicators such as foci investigation testing and treatment and elimination interventions.The FMOH also strives to develop and implement digital standard systems such as the Master Facility Registry, which is now functional.

The objective of the national HIS strategy (2021–2025) is to improve evidence-based decision-making by ensuring availability, access, and use of quality data that positively influence access, quality, and equity of health care delivery at all levels. Some of the targets in this strategy include increasing information use index from 52 to 85 percent, increasing the proportion of health institutions that have functional PMT to 100 percent, increasing report timeliness and completeness to more than 95 percent, increasing DHIS2 implementation at private health facilities from 1 percent to 25 percent, increasing eCHIS implementation to 50 percent of health posts, increasing birth notification from 35 percent to 80 percent, and increasing death notification from 3.4 percent to 35 percent.

PMI supports the implementation of the HIS strategy by promoting DHIS2 data completeness and timeliness, as well as improved use of quality data for decision-making through regular data quality assurance. PMI also supported the eCHIS malaria module development and roll out. Additionally, PMI provided support for the maintenance and use of the Health Commodity Management Information System dashboard, including mBrana, an open source mobile software platform designed to manage inventory,for tracking ITNs, and launching Dagu 2.1, a web-based logistics system which provides real time consumption data at the health facility level and ensures adequate stock on hand through automated alerts.

## OTHER CONTEXTUAL INFORMATION

Recently, Ethiopia has experienced sporadic conflicts in various areas of the country. This included an intense civil war between 2020–2022 affecting the northern part of the country, specifically Tigray, Afar, and Amhara Regions, and which led to large displacement of

individuals as well as disruptions in health care services and surveillance systems.

By February 2022, there were approximately 5.8 million internally displaced persons in Ethiopia, primarily due to conflicts. During the same period, there were approximately 789,000 international refugees in Ethiopia, with the majority living in malarious areas. According to an assessment conducted by the FMOH and partners in June 2022, about 1,436 health facilities, including 22 hospitals, 271 health centers, and 1,143 health posts, were devastated as a consequence of conflicts. The assessment also showed that most health facilities in conflict areas were stocked out of antimalarial medicines and the majority of health facilities didn't have microscopes because of looting. In addition, reagents, consumables, registers, forms, spray pumps and other equipment were looted or destroyed. There were also serious damages to the infrastructure of health facilities.

These recent conflicts severely affected malaria control and elimination programming in Ethiopia. PMI Ethiopia has been working with the NMEP and other partners in the health sector to repair the damage made and increase access and availability of malaria prevention and control services as the security situation allows.

## III. NMCP STRATEGIC PLAN

The malaria epidemiology in Ethiopia saw significant changes since the NMSP 2021-2026 was developed in 2020. In the past two years, the malaria burden doubled nationally, new geopolitical challenges, such as conflicts and drought, as well as new issues, such as the establishment of a new invasive vector—*Anopheles stephensi*—and gaps in the implementation of vector control interventions have significantly affected malaria control progress. For these reasons, the FMOH and various in-country and international partners unanimously agreed to conduct a full World Health Organization malaria program review, despite having two years left in the implementation of the NMSP. In addition to informing the development of the NMSP 2023-2026, the 2023 malaria program review process led to the revised stratification presented above and guided the writing of the Global Fund grant application for 2024-2026.

The NMSP (2023-2026) aims to reduce malaria related morbidity and mortality nationally, while pursuing district level malaria elimination. Specifically, this NMSP proposes to reduce malaria morbidity and mortality by 75 percent and 50 percent, respectively, from 2022 levels. The program also aims to reduce API to less than 10 per 1,000 population in 27 percent of districts that have moderate transmission, achieve zero indigenous malaria in 40 percent of very low and low transmission districts, and prevent and manage imported malaria in the 161 districts reporting zero indigenous malaria cases in 2022. In the previous NMSP (2021-2025) a total of 565 districts were selected for elimination in Ethiopia. The criteria for identifying districts for malaria elimination support included districts with low or very low malaria transmission (API less than 10), districts with API more than 10 were included if they were adjacent to elimination districts, and had availability of district level surveillance data, high coverage of vector control

interventions, adequate access to treatment, limited cross-border population movement, and logistical feasibility.

Strategic Objectives of the NMSP 2024-2026 are:

1. By 2025, achieve adoption of appropriate behavior and practices towards antimalarial interventions by 85 percent of households living in malaria endemic areas.
2. By 2021 and beyond, conduct confirmatory testing for 100 percent of suspected malaria cases and treat all confirmed cases according to the national guidelines.
3. By 2024 and beyond,100 percent of the population living in high, moderate and low malaria risk areas will have one type of globally recommended vector control interventions.
4. By 2024 and beyond, conduct case or foci investigation, classification and response in districts currently having API less than 10 and prevent reintroduction of malaria into areas reporting zero indigenous malaria cases.
5. By 2024 and beyond, generate evidence that facilitates appropriate decision-making through operational research, surveillance, monitoring and evaluation.
6. By 2021 and beyond, build capacity of all levels of the health offices to coordinate and implement malaria elimination interventions.
7. By 2024 and beyond develop a national malaria early warning system to improve epidemic preparedness, detection, and response at all levels.

# IV. KEY MALARIA DATA

## EVOLUTION OF KEY SURVEY BASED MALARIA INDICATORS

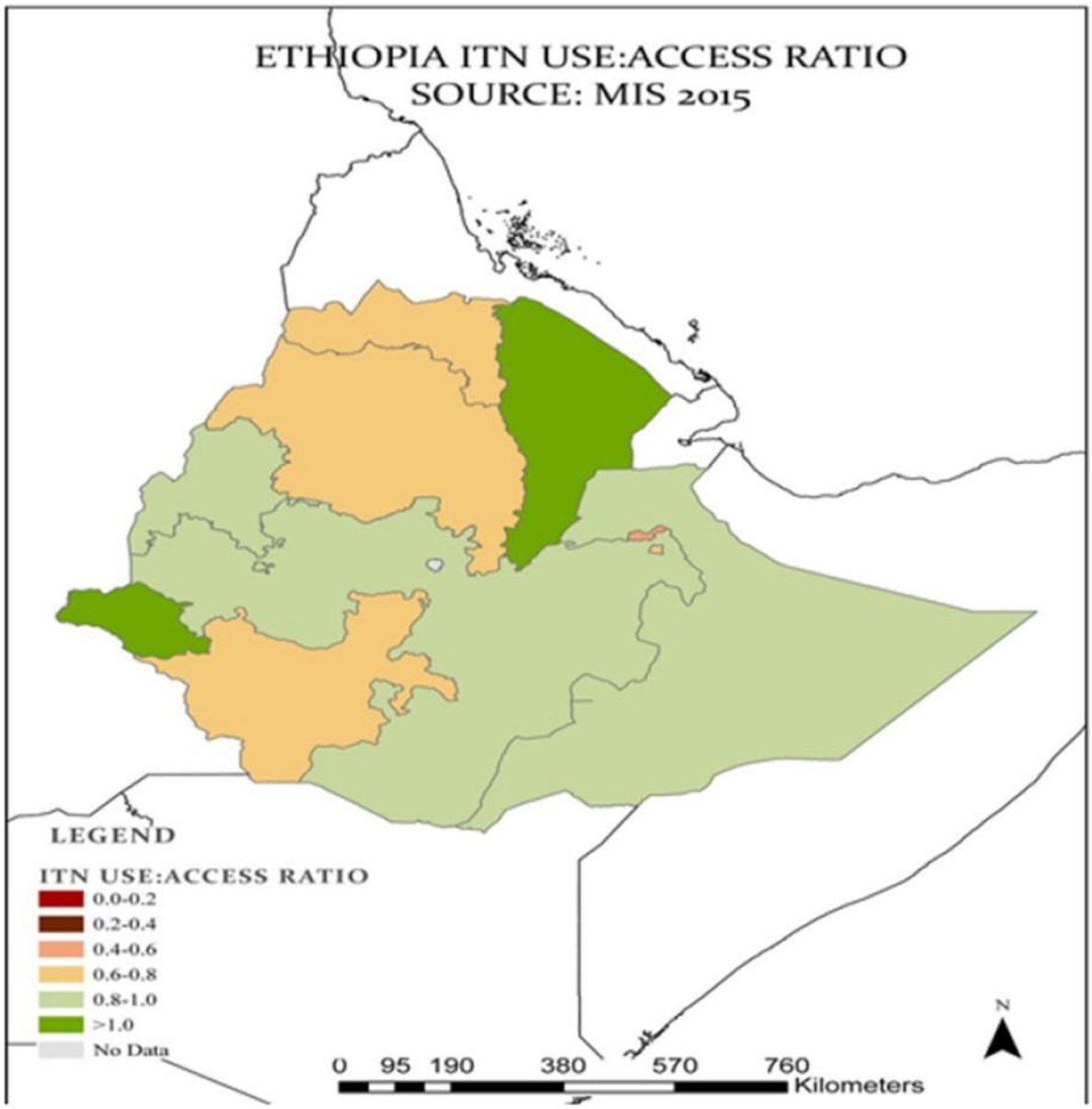
### Table 3: Key Survey Indicators

| Indicator | 2007 MIS | 2011 MIS | 2015 MIS | 2014 Mini-survey* | 2016 EDHS | 2019 Mini-survey* |
|---|---|---|---|---|---|---|
| % of Households with at least one ITN | 65 | 55 | 64 | 65 | N/A | 67 |
| % of Households with at least one ITN for every two people | 37 | 24 | 32 | 39 | N/A | 40 |
| % of Population with access to an ITN | N/A | N/A | 49 | N/A | N/A | 48 |
| % of Population that slept under an ITN the previous night | N/A | 25 | 40 | 43 | N/A | 44 |
| % of Children under five years of age who slept under an ITN the previous night | 41 | 38 | 45 | 51 | N/A | 52 |
| % of Pregnant women who slept under an ITN the previous night | 43 | 35 | 44 | 59 | N/A | 62 |
| % of Children under five years of age with a | 16 | 51 | 38** | N/A | N/A | 64 |

| | | | | | | |
|---|---|---|---|---|---|---|
| fever in the last two weeks for whom advice or treatment was sought within 24 hours | | | | | | |
| % of Children under five years of age with a fever in the last two weeks who had a finger or heel stick | N/A | 17 | 17 | N/A | N/A | N/A |
| % 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 | 29 | 89 | N/A | N/A | N/A |
| % of Women who attended 4 ANC visits during their last pregnancy | N/A | N/A | N/A | 32 | N/A | 43 |
| % of Women who received three or more doses of IPTp during their last pregnancy in the last two years | N/A | N/A | N/A | N/A | N/A | N/A |
| Mortality rate per 1,000 live births among children under five years of age | N/A | N/A | N/A | N/A | 67 | 59 |
| % of Children under five years of age with parasitemia by microscopy | .6 | 1.3† | .6 | N/A | N/A | N/A |
| % of Children under five years of age with parasitemia by RDT | 1.7 | 4.5† | 1.4 | N/A | N/A | N/A |

Mortality rate among children under five years of age of 67 is from EDHS 2016; 59 is from the Mini-DHS 2019.
ACT: artemisinin-based combination therapy; ANC: antenatal care; EDHS: Ethiopia Demographic and Health Survey; ITN: insecticide-treated mosquito net; MIS: Malaria Indicator Survey; RDT: rapid diagnostic test.

## Figure 4. ITN Use:Access Ratio Map




Community-level data are not integrated into the broader HMIS system, so the numbers below only include facility-level data.

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

| Indicator | 2018 | 2019 | 2020 | 2021 | 2022 | Data Source for FY22 |
|---|---|---|---|---|---|---|
| # of All-cause patient consultations | 47,251,175 | 91,663,455 | 102,963,078 | 111,133,602 | 146,275,856 | DHIS2 |
| # of Suspected malaria cases[1] | N/A | N/A | N/A | N/A | NA | |
| # of Patients receiving diagnostic test for malaria[2] | 6,115,025 | 5,655,309 | 6,873,798 | 5,515,043 | 3,079,232 | DHIS2 |
| # of Malaria cases[3] | 1,206,891 | 993,999 | 1,509,182 | 1,220,027 | 1,612,218 | FMOH Report |
| # of Confirmed cases[4] | 989,182 | 904,495 | 1,398,750 | 1,135,338 | 1,504,405 | FMOH Report |
| # of Presumed cases[5] | 217,709 | 89,504 | 110,432 | 84,689 | 107,813 | FMOH Report |
| % of Malaria cases confirmed[6] | 82% | 91% | 93% | 93% | 93% | FMOH Report |
| Test positivity rate[7] | 16% | 16% | 20% | 21% | 49% | FMOH+DHIS2 |
| # of Malaria cases among children under five years of age[8] | N/A | N/A | N/A | 201,111 | 257,618 | FMOH Report |
| % Cases in children under five years of age[9] | N/A | N/A | N/A | 16.50% | 15.98% | FMOH Report |
| # of Severe cases[10] | 30,783 | 15,307 | NA | 19,140 | 53,882 | FMOH Report |
| # Malaria deaths[11] | 158 | 213 | 212 | 132 | 180 | FMOH Report |
| # of Facilities reporting[12] | 131,226 | 257,432 | 261,206 | 258,600 | 249,429 | DHIS2 |
| % of Data completeness[13] | 50% | 71% | 72% | 71% | 69% | DHIS2 |

[1] This indicator is not currently included in health information reporting tools.
[2] RDT 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] # confirmed cases divided by total # cases.
[7] Confirmed cases divided by # patients receiving a diagnostic test for malaria (RDT or microscopy).
[8] Outpatient and inpatient, confirmed and unconfirmed.
[9] Total # of cases among children under five years of age divided by total # of cases.

[10] "Severe cases" are reported to HMIS as cases hospitalized with malaria.
[11] All ages, outpatient, inpatient, confirmed, and unconfirmed.
[12] Total # of health facilities reporting data into the HMIS/DHIS2 system that year.
[13] # monthly reports from health facilities divided by # health facility reports expected (average for the calendar year).
DHIS2: district health information system 2; FMOH: Federal Ministry of Health;

## Table 5: Disaggregated Community-Level Data

| Indicator | 2020 | 2021 | 2022 |
|---|---|---|---|
| # Patients receiving diagnostic test for malaria from a CHW | 1,268,485 | 1,300,715 | 1,172,709 |
| Total # of malaria cases reported by CHWs[1] | 470,493 | 416,092 | 317,140 |
| % of CHW reported cases (among total malaria cases)[2] | 23% | 25% | 20% |

[1] Includes all ages, confirmed and unconfirmed.
[2] Total # malaria cases reported by CHWs/Total # malaria cases in the previous table.
CHW: community health worker.

## 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 sub-nationally.* | Yes, at the sub-national level | | |
| 3. Are foci investigated? *If yes, please note whether this occurs nationally or sub-nationally.* | Yes, at the sub-national level | | |
| **Elimination scope** | **2020** | **2021** | **2022** |
| 4. Total number of districts in the country (admin 2) | 1046 | 1046 | 1082 |
| 5. Number of districts that have been verified as having eliminated malaria?* | 0 | 0 | 0 |
| 6. Among districts ***not*** verified as having eliminated malaria, how many districts are targeted for elimination efforts? | 239 | 565 | 538 |
| 6A. Among districts targeted for elimination efforts, how many have active elimination activities?** | 0 | 154 | 238 |

* Malaria elimination: interruption of local transmission, i.e. no local malaria cases for three years. This refers to NMP-led subnational verification only. It is not referring to 'elimination certification,' which WHO only grants for an entire country.
** Elimination activities include, but are not limited to reactive ITN and/or IRS, 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*, SBC for hard to reach or migrant populations, case investigation, foci classification, etc.

# V. Other Implementation Information

## Table 7: Results of Durability Monitoring (May 2015–May 2018)

| Site/Net Type | Survey and Time Since Distribution (months) | Attrition to Wear and Tear (%) | Nets in Serviceable Condition (%) | Optimal Insecticidal Effectiveness in Bioassay (%) |
|---|---|---|---|---|
| Tigray, Amhara, Oromia, and SNNP Regions Standard ITNs (MAGNet® and PermaNet®) | 12 | 22 | 48.6 | 100 |
| | 24 | 39.1 | 39.6 | 95.3 |
| | 36 | 71.8 | 15.6 | 19 |

SNNP: South Nations, Nationalities, and Peoples.

## Table 8: Summary of Completed Therapeutic Efficacy Studies

| Year | Site | Treatment arm(s) | Efficacy (PCR-corrected adequate clinical and parasitological result) for each drug at each site |
|---|---|---|---|
| 2017[1] | Pawe, Arbaminch | Pf/AL | 98% |
| | | Pf/DP | 100% |
| | | Pv/CQ | 98% |
| | | Pv/DP | 100% |
| 2017[2] | Chewaka | Pf/AL | 96% |
| 2019† | Arbaminch, Abergele, and Bambasi | Pf/AL+ SD-PQ | >90%* |
| | | Pv/CQ+ 14-PQ | >90%* |
| 2020† | Metehara, Shewarobit, Arbaminch, Hamusit | Pf/AL+ SD-PQ | N/A |
| | | Pv/DP+ 14PQ | N/A |
| | | Pv/PY+ 14PQ | N/A |
| 2021 | Meksegnit, Enfranz** | Pf/AL | >96.8¶§ |
| | | Pf/PY+SD-PQ | >90.8¶§ |
| | | Pv/CQ | >98.6¶§ |
| | | Pv/PY+SD-PQ | >98.8¶§ |
| 2021[4] | Dera Woreda, South Gonder | Pf/PA | 98.9% |
| 2021[4] | Dera Woreda, South Gonder | Pv/PA | 95.9%¶ |
| 2021[5] | Arba Minch | Pf/AL | 98.6% |
| 2021[6] | Arba Minch | Pv/DP | 100% |

AL, ASAQ, DP, and CQ have therapeutic efficacies above the 90 percentWorld Health Organization recommended threshold

and are well-tolerated in Ethiopia.
AL: artemether-lumefantrine; DP: dihydroartemisinin-piperaquine; CQ: chloroquine; N/A: not available; PCR: polymerase chain reaction; SD-PQ: single dose primaquine; Pf: Plasmodium falciparum; Pv: Plasmodium vivax; PY: Pyramax (artesunate/pyronaridine); SD: single-dose.
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[2] Abamecha, A., Yilma, D., Addisu, W., El-Abid, H., Ibenthal, A., Noedl, H., Yewhalaw, D,. Moumni, M., & Abdissa, A. Therapeutic efficacy of artemether-lumefantrine in the treatment of uncomplicated *Plasmodium falciparum* malaria in Chewaka District, Ethiopia. *Malar J.* 19:240 (2020).
[3] Alebachew, M., Gelaye, W., Abate, M., Sime, H., Hailgiorgis, H,. Gidey, B,. Haile, M., Assefa, G., Bekele, W., Belay, Habtamu., Parr, J., Tasew, G., Mohammed, H., & Assefa, A. Therapeutic Efficacy of pyronaridine-artesunate (Pyramax) against uncomplicated *Plasmodium falciparum* infection at Hamusit Health Center, Northwest Ethiopia. *Malaria Journal* 22:186. (2023)
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[5] Gubae, K., Mohammae, H., Sime, H., Hailgiorgis, H., Mare, A., Gidey, B., Haile, M., Assefa, G., Bekele, W., Tasew, G., Abay, S. & Assefa, A. Safety and therapeutic efficacy of artemether-lumefantrine in the treatment of uncomplicated *Plasmodium falciparum* malaria at Shecha health centre, Arba Minch, Ethiopia. *Malaria Journal.* 22:9 (2023).
[6] Mohammed, H., Sime, H., Hailgiorgis, H., Gubae, K., Haile, M., Solomon, H., Etana, K., Girma, S., Bekele, W., Chernet, M., Tollera, G., Tasew, G., Gidey, B., Commons, R., & Assefa, A. Therapeutic efficacy of dihydroartemisinin-piperaquine for the treatment of uncomplicated *Plasmodium vivax* malaria in Seacha area, Arbaminch Zuria District, South West Ethiopia. *Malaria J.* 21:351. (2022).
† Funded by Global Fund.
* Reports not yet available for formal review of the methods.
§ PMI report not yet finalized.
¶ PCR-uncorrected result.

# VI. Key Policies

## Table 9: Policies in Ethiopia

| | |
|---|---|
| **Ethiopia Malaria Elimination Strategic Plan 2021 - 2025** | |
| **National SM&E Plan (Surveillance, Monitoring and Evaluation Manual for Malaria Elimination in Ethiopia)** (February 2017) | |
| **National Digital Health Strategy (Digital Health Blueprint)** (August 2021) | |
| **National Social Behavior Change/Communication Strategy** (February 2021) | |
| **National Supply Chain Strategy/Master Plan** (Revised Pharmaceutical Supply Transformation Plan 2018 - 2020) (September 2018) | |
| **National Vector Control Strategy and/or Integrated Vector Management Plan (Vector Control Operational Manual for Malaria Elimination in Ethiopia)** (April 2017) | |
| **Malaria Case Management Policy (National Malaria Guidelines, Fourth edition)** (March 2018) | |
| What is/are the first-line treatment(s) for uncomplicated *P. falciparum* malaria? | Artemether-lumefantrine plus single dose ( .25mg/kg) primaquine |
| What is/are the second-line treatment(s) for uncomplicated *P. falciparum* malaria? | Dihydroartemisinin piperaquine |
| What is/are the first-line treatment(s) for uncomplicated *P. vivax* malaria? | Chloroquine plus primaquine ( .25mg/kg) x 14 days without G6PD testing |

| | |
|---|---|
| What is the first-line treatment for severe malaria? | Injectable artesunate followed by full dose of 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? (please include any plans for training providers on the new policy) | Ethiopia's national malaria program has already shifted to AL from quinine tabs for the treatment of uncomplicated falciparum malaria in the first trimester. This policy change was made before the WHO policy change and this change has already been included in the case management training. |
| In pregnancy, what is the current first-line treatment for uncomplicated *P. falciparum* malaria in the first trimester? | Artemether-lumefantrine |
| In pregnancy, what is/are the 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? | Chloroquine |
| In pregnancy, what is the first-line treatment for severe malaria? | Injectable artesunate |
| Is pre-referral treatment of severe disease recommended at peripheral health facilities? If so, with what drug(s)? | Yes, rectal artesunate at health posts and first dose of injectable artesunate at health centers (as part of IMNCI algorithm). |
| Is pre-referral treatment of severe disease with rectal artesunate recommended for community health workers? | Yes |
| **Community Health Policy (A Roadmap for Optimizing the Ethiopian Health Extension Program 2020-2035)** (July 2020) | |
| What is the # of CHWs currently providing iCCM? | 97.7% of health posts provide iCCM (ARM report 2021 page 37). |
| What is the country's target for number of CHWs providing iCCM? | 100% |
| What percent of the country's target is met? | 97.7% |
| Does the country have a policy that enables the routine, regular payment of salaries/stipends for CHWs? | Yes, community health workers are paid by the Government. |
| Do CHWs have the authority to test and treat all ages for malaria? | Yes |
| **Prevention of Malaria in Pregnancy Policy (National Antenatal Care Guideline)** (February 2022) | |
| 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 Ethiopia. |
| Do the national ANC guidelines reflect the WHO | Yes |

| | |
|---|---|
| 2016 recommendation of 8 ANC scheduled contacts (plus one additional contact for early initiation of IPTp at 13-16 weeks)? If not, how many ANC contacts are recommended? | |
| What is the status of training ANC providers on the WHO recommended 8+ contacts? | FMOH has started training health professionals at hospitals level, but not yet cascaded to the health centers or health 27 posts level |
| Have HMIS/DHIS2 and ANC registers been updated to include 8+ contacts? | Yes, this is included in the HMIS |
| 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 6 months prior? | NA |
| Is ANC/IPTp provided by facility staff conducting ANC outreach to communities? | NA |
| Can CHWs deliver IPTp and if so, which specific cadres and beginning with which dose?How many districts are targeted for c-IPTp implementation? | NA |

ACT: artemisinin-based combination therapy; ANC: antenatal care; CHW: community health worker; HMIS/DHIS2; health management information system/district health information system 2; iCCM: integrated community case management; IPTp: intermittent preventive treatment during pregnancy; ITN: RDT: rapid diagnostic test; SP: sulphadoxine-pyrimethamine; WHO: World Health Organization.

# VII. PARTNER LANDSCAPE

## Table 10: Partner Landscape

| Partner | Key technical interventions | Geographic coverage | Funding amount or in-kind contribution | Timeframe |
|---|---|---|---|---|
| Global Fund | • Support for nationwide mass campaigns<br>• Procurement of national needs for ACTs, RDTs, and ITNs<br>• Training and supportive supervision in 9 regions<br>• Malaria elimination surveillance support for targeted districts | • National for ITN campaign<br>• 9 regions for other activities | $227 million disbursed<br>-115,537 ACTs box of 30 (arrived)<br>- 101,500 ACTs box of 30 (ordered November 2021)<br>-102,923 ACTs box of 30 (ordered April 2022)<br>-214,351 RDTs test of 25 (awaiting shipment)<br>243,789 RDTs (ordered April 2022) | Current grant covers July 2021–June 2024 |
| Government of Ethiopia | • Salaries for NMEP Staff and HEWs<br>• Limited procurement of insecticides and operational costs for IRS and procurement of larvacides | • National | - Difficult to track | Continuous |

ACT: artemisinin-based combination therapy; ITN: insecticide-treated mosquito net; NMEP: National Malaria Elimination Program; RDT: rapid diagnostic test.