MINISTRY OF HEALTH GHANA

2021 - 2025
MALARIA
STRATEGIC PLAN

NATIONAL MALARIA CONTROL PROGRAMME

GHANA HEALTH SERVICE

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MALARIA STRATEGIC PLAN

(2021 - 2025)

NATIONAL MALARIA CONTROL PROGRAMME

Foreword
Acknowledgements
Acronyms and Abbreviations

ACT	Artemisinin-Based Combination Therapy
ADR	Adverse Drug Reaction
AIDS	Acquired Immune Deficiency Syndrome
ANC	Antenatal Care
API	Annual Parasite Incidence
BMC	Budget Management Centre
CHAG	Christian Health Association of Ghana
CHO	Community Health Officer
CHPS	Community Health Planning Services
CLU	Clinical Laboratory Unit
CPPA	Community Pharmacy Practitioners Association
CSO	Civil Society Organisation
DHIMS	District Health Information Management Systems
DHS	Demographic and Health Survey
DOT	Directly Observed Therapy
FDA	Food and Drugs Authority
FHD	Family Health Division
GDP	Gross Domestic Product
GhiLMIS	Ghana Integrated Logistics Management Information System
GHS	Ghana Health Services
GMF	Ghana Malaria Fund
GSS	Ghana Statistical Service
GTS	Global Technical Strategy
HIV	Human Immunodeficiency Virus
HSS	Health System Strengthening
ICT	Information and Communication Technology
IPTp	Intermittent Preventive Treatment of Malaria in Pregnancy
IRS	Indoor Residual Spraying
IT	Information Technology
ITN	Insecticide Treated Net
LLIN	Long-lasting Insecticidal Nets
M&E	Monitoring and Evaluation
MICS	Multiple Indicator Cluster Survey
MIP	Malaria in Pregnancy
MIS	Malaria Indicator Survey
MoFEP	Ministry of Finance and Economic Planning
MoH	Ministry of Health
MPR	Malaria Programme Review
NGO	Non-Governmental Organisation
NMCP	National Malaria Control Program
NMIMR	Noguchi Memorial Institute for Medical Research
NMSP	National Malaria Strategic Plan
NHIS	National Health Insurance Scheme
OTCMS	Over the Counter Medicine Sellers
OTSS	Outreach Training Supportive Supervision

P&S	Procurement and Supply
PBO	Piperonyl Butoxide
PfPR	P. falciparum parasite prevalence
PMI	President's Malaria Initiative
PPA	Public Procurement Authority
PPME	Policy Planning Monitoring and Evaluation
QAD	Quality Assurance Department
RDT	Rapid Diagnostic Test
RHD	Regional Health Directorate
RMS	Regional Medical Store
SBC	Social and Behavioural Change
SBCC	Social Behaviour Change Communication
SM&E	Surveillance, Monitoring and Evaluation
SMC	Seasonal Malaria Chemoprevention
SP	Sulfadoxine-Pyrimethamine
SPI	Specific prevention interventions
SPR	Slide Positivity Rate
SSDM	Stores, Supplies and Drug Management
UHC	Universal Health Coverage
UNICEF	United Nations Children's Fund
USAID	United States Agency for International Development
WHO	World Health Organisation

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Executive Summary

Introduction: Malaria is endemic and perennial in all parts of the country, with varying transmission intensity and seasonal variations that are more pronounced in the northern regions. In Ghana malaria affects people of all ages. The burden of malaria affects every aspect of the health, social and economic lives of the people. The parasite Plasmodium falciparum accounts for over 90% of malaria illness in the country with the principal mosquito vectors being Anopheles gambiae and Anopheles funestus.

Malaria control initiatives started in the country in the colonial era. A number of strategies and interventions have been developed over the years to address the menace caused by the disease. Current malaria control efforts led by the National Malaria Control Program (NMCP) are based on the national strategic guidance and objectives to achieve a reduction in malaria mortality by 90%, reduce malaria case incidence by 50% (using 2019 as the base year) and to achieve malaria pre-elimination in at least 7 districts by 2025. The national efforts are in line with the guidance of the World Health Organization (WHO), the principles of Roll Back Malaria (RBM), Sustainable Development Goals (SDGs) and other global initiatives which aim to reduce the disease burden of malaria and target it for elimination.

Program implementation has been guided by periodic national malaria strategic plans. The national malaria strategic plan of 2014-2020 was developed in collaboration with stakeholders to give strategic vision, direction, and coordination to malaria control in the country

Overall, key findings from the 2019 Malaria Program Review (MPR, 2019) indicate that the Parasite prevalence in Ghana has reduced from 27.5% in 2011(MICS, 2011) to 14.1% in 2019 (MIS,2019) representing 48.7% reduction in prevalence. Confirmed malaria cases (microscopy and RDTs) per 1000 population rose from 155 in 2015 to 193 per 1000 population in 2019, while the malaria test positivity rate has reduced from 50% in 2012 to 20.1% in 2018. Nationally, the proportion of deaths attributed to malaria decreased from 9 per 100,000 in 2013 to 1.4 per 100,000 population in 2018, with a relatively higher reduction in Case Fatality Rate, from approximately 0.51 in 2014 to 0.16 in 2018, representing 68.6% reduction over the period.

In general, there has been an increase of Long-lasting Insecticide Treated Net (LLIN) ownership from 68% in 2014 to 73.7% in 2019. The proportion of children under 5 years who slept under an ITN the previous night increased from 46% in 2014 to 54 % in 2019, however, there was only a marginal increase from 46% in 2014 to 48.7% in 2016 among pregnant women who slept under an insecticide- treated net, the night prior to the survey.

These achievements are attributed to the increase in funding support from Government, Global Fund and other Health Partners, leading to implementation of effective, affordable and accessible interventions.
The current Strategic Plan 2021-2025, has been developed primarily based on:

- recommendations from the 2019, Malaria Program Review (MPR);
- findings of the 2014 Demographic and Health Survey (DHS);
- findings from 2016 and 2019 Malaria Indicator Surveys (MIS).
- findings of the 2017/2018 Multiple Indicator Cluster Study (MICS);
- Ghana's Universal Health Coverage (UHC) Roadmap.
- new and emerging interventions, public health and clinical emergencies at the global level and the potential effects on the national malaria control efforts.

The 2021-2025 strategic plan consolidates the achievements gained in the last eight years and builds on new interventions and strategies with inputs from a broader range of stakeholders including health partners, community members, research community, academia, and NGOs. It defines strategies to be implemented to achieve the goal set for the NMCP in Ghana and guides its partners to re-strategize towards accelerated malaria control and pre-elimination in targeted areas of the country.

The National Malaria Strategic Plan 2021-2025, contain seven objectives with key strategies and defined activities. The activities have been costed and a gap analysis conducted to indicate efforts needed to achieve a reduction in malaria mortality by 90%, reduce malaria case incidence by 50% (using 2019 as the base year) and to achieve malaria pre-elimination in at least seven districts by 2025.

Goal , Objectives and strategies:

In line with the vision of the health sector in Ghana -"All people in Ghana have timely access to high quality health services irrespective of ability to pay at the point of use" and goal to "Increased access to quality essential health care and population-based services for all by 2030", the NMSP 2021-2025 has three main goals.

- Reduce malaria mortality by 90% by 2025 (using 2019 as baseline)
- Reduce malaria case incidence by 50% by 2025 (using as 2019 baseline)
- Achieve malaria pre-elimination in at least 6 districts by 2025

These goals will be achieved through seven main objectives with clearly defined strategies and fully costed activities.

Objectives of the NMSP 2021-2025

1. Protect at least 80% of the population at risk with effective malaria prevention interventions by 2025
2. Provide appropriate diagnosis to all suspected malaria cases and prompt and effective treatment to 100% of confirmed malaria cases in accordance to treatment guidelines by 2025.
3. Ensure at least 95% of the population will use at least one malaria preventive measure, and 95% of those with fever seek care within 24 hours of onset of symptoms, by 2025.
4. Strengthen and maintain capacity for Governance and program management to achieve programmatic objectives at all levels of the health care system towards malaria control and pre-elimination by 2025
5. Ensure timely and adequate supply of quality-assured malaria commodities to all service delivery points by 2025
6. Improve mobilization of resources and maximize the efficient use of available resources for greater public health impact by 2025
7. Strengthen malaria surveillance and M&E system towards the 2025 malaria control targets

Summary of the Proposed Strategies:

Objective 1: Protect at least 80% of the population at risk with effective malaria prevention interventions by 2025.

Strategies:

- Distribution of LLINs through mass campaigns
- Distribution of LLINs through Antenatal and Child Welfare Clinics and schools
- Indoor Residual spraying for areas with high parasite prevalence
- Larval Source Management in targeted areas
- Alternative emerging methods of protection from the vector
- Seasonal Malaria Chemoprevention
- Prevention of malaria in pregnancy

Objective 2: Provide appropriate diagnosis to all suspected malaria cases and prompt and effective treatment to 100% of confirmed malaria cases in accordance to treatment guidelines by 2025.

Strategies:

- Provide quality malaria diagnosis at all levels of care (Including QUASI-Government facilities)
- Strengthen capacity of health care workers for malaria case management at health facilities
- Strengthen capacity building for malaria case management at health training institutions (Pre-service)

- Build capacity and Improve access to diagnosis and treatment in the private sector (clinics, pharmacies & laboratories)
- Strengthen referral systems and quality management for severe malaria case management at all levels
- Increase access of healthcare delivery to communities through CHPS by strengthening collaboration with other division.
- Improve availability of guidelines, protocols, job aids
- Enforce adherence to guidelines at all levels

Objective 3: Ensure at least 95% of the population will use at least one malaria preventive measure, and 95% of those with fever seek care within 24 hours of onset of symptoms, by 2025.
Strategies:

- Advocacy with stakeholders for commitment to ensure malaria interventions are prioritised and supported.
- Strengthen capacity of health workers at all levels in both public and private institutions to effectively engage communities.
- Increase awareness and knowledge of the entire population on malaria prevention and control interventions through;
  - o Use of Mass Media as a strategy for engaging the public on malaria control Interventions.
  - o Use of social media to engage youths on malaria behaviour change activities,
  - o Strengthening CHPS staff outreach capacity for Community Engagement for malaria control and Social Mobilization.
  - o Use Campaigns on malaria interventions to trigger actions in times of special malaria interventions, low coverages, vaccination and replacement of ITNs.
- Risk communication and emergency preparedness
- Strengthen Coordination and Implementation mechanism for SBC activities
- Work actively with Health Promotion Division-GHS
- Community engagement and IPC
- Strengthen Monitoring & Evaluation of SBC interventions.

Objective 4: Strengthen and maintain capacity for Governance and program management to achieve programmatic objectives at all levels of the health care system towards malaria control and pre-elimination by 2025.
Strategies:

- Enhance political will for malaria control and pre-elimination
- Strengthen coordination and partnerships including private health providers
- Orientation and training pre-elimination activities
- Supervision of malaria program implementation at all levels
- Build capacity of national level staff on current and emerging Information Technologies
- Upgrade IT infrastructure of the NMCP to allow a more coordinated approach to service delivery through automation
- Ensure technologies procured are secure, reliable and minimize risk

Objective 5: Ensure timely and adequate supply of quality-assured malaria commodities to all service delivery points by 2025

Strategies:

- Advocate for accurate data driven forecasting and supply planning of malaria commodities
- Advocate for effective procurement and timely delivery of malaria commodities
- Advocate for efficient warehousing and sustainable distribution system across the supply chain
- Strengthen quality assurance systems for malaria commodities
- Support full implementation of Ghi LMIS for the provision of accurate and timely supply chain information for decision making at all levels (may not be possible at all HF though)

- Strengthen capacity of health care workers involved in commodity management at sub-national levels
- Establish guidelines and policies to guide implementation for the supply of RDTs and SPs to private sector

Objective 6: Improve mobilization of resources and maximize the efficient use of available resources for greater public health impact by 2025.

Strategies: The finance strategy outlines current funding resources, allocation, management and risk mitigation related to the financial resources for supporting Malaria programming.
Based on the strategic direction of the NMCP, issues and challenges in the Malaria financing situation in Ghana, the following policy statements form the foundation of this strategic Framework for Malaria financing:

1. Allocate existing resources and ensure their efficient use at service delivery level.
2. Advocate for stronger government investment through revenue collection.
3. Mobilize and allocate resources to under-funded priorities in malaria programming.
4. Implement de-concentration and decentralization, using sound planning and financial management tools, regional block grants and internal contracting.
5. Strengthen harmonization and alignment for results and donor funding.

Objective 7: Strengthen malaria surveillance and M&E system towards the 2025 malaria control targets.
This aims to strengthen malaria surveillance system through DHIMS2 to ensure timely availability of high quality, consistent and relevant malaria data at all levels (health facilities [public, private, quasi gov't]) and 50% pharmacies and OTCMS Seller) in order to track the progress of the malaria control and prevention interventions towards the 2025 malaria control targets.

Strategies::

- Strengthening technical capacity for surveillance of malaria control at all levels
- Strengthening the logistics structure for surveillance at all levels
- Improve malaria quality assurance system at all levels
- Establish malaria surveillance, M&E system for pharmacies and OTCMS
- Strengthening surveillance at sentinel sites
- Dissemination of surveillance reports
- Enhanced coordinated monitoring of program progress towards malaria elimination
- Improve data analysis and use at all levels

For Areas targeted for Pre-elimination (API and SPR <5%)

- Confirm every suspected malaria cases and adhere to all the treatment protocols
- Improve in the diagnostic capacity of the districts for differentials for fever
- Weekly case-based malaria data reporting through IDSR
- Establish thresholds to identify outbreaks
- Intensify the culture of data use for appropriate response and surveillance activities in the targeted areas
- Reactive case detection and treatment
- Peer review by the districts targeted for pre-elimination
- Migrate reporting system to case-base reporting at all service delivery sites

Projected cost and financial gap analysis.
The total cost of all activities per the objectives of the NMSP 2021-2025 is $1 046 932 894 and a Financial gap (total national strategic plan budget less the total current and planned resources) of $848,969,528.11.
Efforts will be made to ensure that the integrity of the Programme and systems are always respected in the process of resource mobilization and utilization. The NMCP therefore wishes to bring to the attention of all its partners, potential partners and collaborators, the need to mobilize resources (both human and financial) to support the scale up of interventions, sustain gains made in malaria control and build the health system's capacity to remove implementation bottlenecks. This is critical to the success of achieving set targets in this seven-year strategy.

1. INTRODUCTION

Malaria is endemic and perennial in all parts of Ghana, with varying transmission intensity and seasonal variations that are more pronounced in the northern regions. In Ghana, malaria affects people of all ages. The burden of malaria affects every aspect of the health, social and economic lives of the people. The parasite Plasmodium falciparum accounts for over 90% of malaria illness in the country with the principal mosquito vectors being Anopheles (An.) gambiae and An. funestus.

Malaria control initiatives started in the country in the colonial era. Numerous strategies and interventions have been developed over the years to address the menace caused by the disease. Current malaria control efforts led by the National Malaria Control Programme (NMCP) are based on the national strategic guidance and objectives to achieve a reduction in malaria mortality by 90%, reduce malaria case incidence by 50% (using 2019 as the base year) and achieve malaria pre-elimination in at least six districts by 2025. The national efforts are in line with the guidance of the World Health Organisation (WHO), the principles of Roll Back Malaria, the Sustainable Development Goals and other global initiatives which aim to reduce the disease burden of malaria and target it for elimination.

The work of the NMCP has been guided by national malaria strategic plans (NMSPs). The NMSP of 2014-2020 was developed in collaboration with stakeholders to give strategic vision, direction, and coordination to malaria control in the country.

Overall, key findings from the 2019 Malaria Programme Review (MPR) indicate that malaria parasite prevalence in Ghana has reduced by 48.7% in recent years, from 27.5% in 2011 to 14.1% in 2019 . Confirmed malaria cases (by microscopy and rapid diagnostic tests (RDTs)) per 1000 population rose from 155 per 1000 in 2015 to 193 per 1000 in 2019, whilst the malaria test positivity rate has reduced from 50% in 2012 to 20.1% in 2018. Nationally, the proportion of deaths attributed to malaria decreased from 9.0 per 100,000 in 2013 to 1.4 per 100,000 population in 2018. Finally, the case fatality rate has dropped by 68.6% in the period, from approximately 0.51 in 2014 to 0.16 in 2018.

In general, there has been an increase in long-lasting insecticide-treated net (LLIN) ownership from 68% in 2014 to 73.7% in 2019. The proportion of children under 5 years who slept under an insecticide-treated net (ITN) the previous night increased from 46% in 2014 to 54% in 2019; however, there was only a marginal increase, from 46% in 2014 to 48.7% in 2016, amongst pregnant women who slept under an ITN on the night prior to the survey.

These achievements are attributed to the increase in funding support from government, Global Fund to Fight AIDS, Tuberculosis and Malaria (Global Fund) and other health partners, leading to implementation of effective, affordable and accessible interventions.
The latest NMSP, for 2021-2025, has been developed primarily based on:

- Recommendations from the 2019 MPR;
- Findings of the 2014 Demographic and Health Survey (DHS);
- Findings of 2016 and 2019 Malaria Indicator Surveys (MIS);
- Findings of the 2017/2018 Multiple Indicator Cluster Study (MICS);
- Ghana's Universal Health Coverage (UHC) Roadmap; and
- New and emerging interventions, public health and clinical emergencies at the global level and the potential effects on the national malaria control efforts.

The NMSP 2021-2025 consolidates these achievements of the last eight years and builds on new interventions and strategies with inputs from a broader range of stakeholders including health partners, community members, research community, academia, and non-governmental organisations (NGOs). It defines strategies to be implemented to achieve the goal set for the NMCP in Ghana and guides its partners to re-strategize towards accelerated malaria control and pre-elimination in targeted areas of the country.

There is a critical need to mobilize resources to support the scale-up of interventions, sustain control and elimination in targeted areas as well as build health systems' capacities to remove implementation bottlenecks for the successful implementation of the NMSP interventions and to achieve set targets.

1.1 The Process of Developing the National Strategic Plan.

The NMSP 2021-2025 was developed following recommendations from the MPR conducted in 2019. The NMSP was developed through a participatory approach using the capacities of multiple stakeholder and partner collaborators, institutions and agencies from multiple sectors.

Various in-country resource persons, with support from WHO, provided technical support for developing various thematic areas of the document. The preparatory process involved in-person working group meetings as well as working remotely in a coordinated manner. Plenary sessions were held during the write-up of the plan and a review mechanism was put in place to address issues identified during the plenaries. A WHO Costing Consultant worked with the thematic groups on costing and budgeting of the strategic plan.
The draft strategic plan was circulated to all key stakeholders for their input. The document went through a process of joint assessment and review by various external and internal resource persons and inputs were incorporated appropriately.

The NMSP 2021-2025 contains seven objectives with key strategies and defined activities. The activities have been costed and a gap analysis conducted to indicate efforts needed to achieve a reduction in malaria mortality by 90%, reduce malaria case incidence by 50% (using 2019 as the base year) and achieve malaria pre-elimination in at least six districts by 2025.

2. COUNTRY PROFILE

2.1 Geography: Ecosystem, Environment and Climate

The Republic of Ghana is centrally located on the West African coast and extends inland from the Gulf of Guinea. It is bordered on the south by the Atlantic Ocean, on the east by Togo, on the north and northwest by Burkina Faso and on the west by Cote d'Ivoire (Figure 2.1). The country is bisected by the Greenwich Meridian and lies entirely within the northern tropics between latitudes 4oN and 12oN of the equator. It covers a surface area of 238,537 sq km and has a coastline of 540 km, most of which is relatively flat, except for a range of hills on the eastern border and Mt. Afadjato – the highest point above sea level (884 metres) – located east of the Volta River.

Figure 2.1: Map of Ghana and neighbouring West African countries

There are three ecological zones in the country: the Southern zone made up of sandy coastline backed by a coastal plain which is crossed by several rivers and streams; the middle transitional belt made up of heavily forested areas with many streams and rivers; and a northern savannah, which is drained by the Black and White Volta Rivers (Figure 2.2). Volta Lake, created as result of the construction of hydroelectric dam in the eastern part of the country is one of the largest artificial lakes in the world.
The southern regions of Ghana are mostly grasslands and shrub lands, along with forests. These forests extend to the east for 270 km. Southern Ghana has become an important location for extracting industrial minerals.

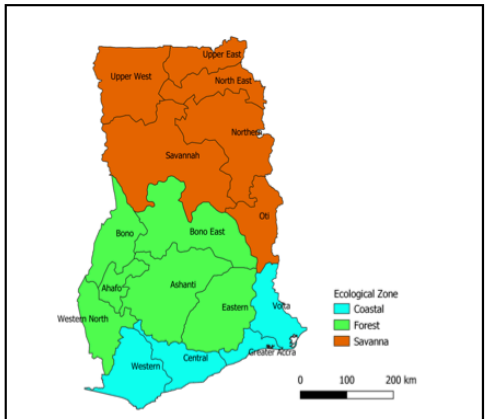


Figure 2.2: Ecological zones of Ghana

The country has a tropical climate with temperatures and rainfall varying according to distance from the coast and elevation. Generally, temperatures are between 21oC and 31oC in the south; in the north, they can reach 38oC . Annual rainfall ranges from about 2,030mm in the southwest to about 1,015mm in the north . The south has two distinct rainy seasons: April to June and September to October, with drier months in between. Northern Ghana has a rainy season from April to October; the rest of the year is hot and dry.

The harmattan, a dry desert wind, blows from the northeast between December and March, lowering the humidity and creating very warm days and cool nights in the north. In the south, the effects of the harmattan are felt mainly in January. Average relative humidity ranges from nearly 100% in the south to 65% in the north; during the harmattan season the drier areas can fall as low as 12%.

Environmental factors such as land cover, vegetation (savannah, tropical forest, and mangrove and swampy areas), coupled with the generally warm temperatures (mean of 26o C) and rainfall (ranging from 100mm to 2800mm) all contribute to the endemic risk of contracting malaria. Altitude ranges from sea level to 750m above create temperatures favourable for the breeding of mosquito vectors (An. gambiae, An. arabiensis and An. funestus) and the development of malaria parasites, and this significantly increases the malaria risk in Ghana. The climate, rainfall pattern and tropical conditions have made malaria perennial in Ghana and climate change may worsen these conditions; therefore, adaptation and malaria mitigation measures are imperative.

2.2 Demography

The current population of Ghana is estimated to be 30.42 million, based on the official 2010 census figure of 24.2 million and a population growth rate of 2.2%; this gives the country an overall population density of 121 people per sq km. Out of Ghana's 30 million people, 50.9% are male and 49.1% are female (Table 2.1).
Most people in Ghana are citizens of Ashanti territories or Ashanti-land: 4.7 million live in Ashanti, 2.3 million in Brong-Ahafo region, 2.2 million in Central, 2.6 million in Eastern, 2.3 million in Western and 4 million in Greater Accra. Major ethnic groups are the Akan (47.5%), Dagbani (17%), Ewe (14%), Ga-Adangbe (7%), Gurma (6%), Guan (4%), Gurunsi (2.5%) and Bissa (1%).

Common languages in Ghana are: Asante 16%, Ewe 14%, Fante 11.6%, Boron (Brong) 4.9%, Dagomba 4.4%, Dangme 4.2%, Dagaare (Dagaaba) 3.9%, Kokomba 3.5%, Akyem 3.2%, Ga 3.1% and "other" at 31.2%. The English language functions as an official language. In terms of religions, 71% of Ghanaians are Christian and 17% are Muslim, and the country accepts all faiths .

Table 2.1: Demographic characteristics of Ghana

Indicator	National value
Age structure*	0-14 years: 40% 15-24 years: 18.9% 25-54 years: 33.5% 55-64 years: 4.6% 65 years and over: 4% Women in Reproductive Age Group (WIRA)/ Women in Fertile Age Group (WIFA): 22% (GDHS 2014)

Birth rate*	32 births/1,000 population
Death rate*	7.7 deaths/1,000 population
Infant mortality rate**	Total: 37 deaths/1,000 live births
Under 5 mortality**	Total: 52 deaths/1,000 live births
Maternal mortality**	310 deaths/100,000 live births
Life expectancy at birth**	Total: 63; males: 62.4 years; females: 64.43
Total fertility rate (children born/woman)**	Total: 3.9; rural: 4.7; urban: 3.3
Literacy (those aged 15 and above; can read and write)*	Total population: 71.5%; male: 78.3%; female: 65.3%
Health expenditure (National Budget, 2019)	6.7% of GDP (2019)
Physician density	18 physicians/100,000 population (2019)
Net migration rate***	56 migrant(s)/1,00,000 population
Population growth rate***	2.2% (2018)
Urbanisation*	Urban population: 51% Rural population: 49%

[8] [http://worldpopulationreview.com/ countries/ghana-population/]

	Rate of urbanisation: 3.4% annual rate of change

*Population and Housing Census 2010; ** Ghana Maternal Health Survey Report, 2017; ***Ghana Statistical Service (GSS)/ World Population Prospects 2019; http://worldpopulationreview.com/countries/ghana-population/;

2.3 Socio-economic Situation

Over the last decade, Ghana's economy has undergone major changes. In 2010, following the rebasing of the economy, Ghana became a lower middle-income country. Prudent fiscal and macroeconomic policies and management have given the country macroeconomic stability, which has substantially improved economic performance. Economic growth has improved, as evidenced by a real GDP growth rate from 4.9% in 2009 to 6.7% in 2019 (Table 2.2).

Ghana's main exports are cocoa, timber and pineapple, and gold also is a principal revenue source. The discovery of oil in the country has provided an additional source of revenue to support the economy. Ghana has been exporting oil in commercial quantities, approximately 70,000 barrels, every year since 2009 .

Media liberalisation has provided opportunities for the use of various media or communication channels to disseminate information about public health behaviors and provided the platform for civil society engagement on health issues. This is important, because social arrangements, gender norms and cultural practices have sometimes hindered the ability of the vulnerable, especially women, to make choices that enhance their health.

Table 2.2: Socio-economic characteristics of Ghana

Indicator	National Value
GDP per capita*	$1807.10
UNCP Human Development Index and ranking*	Ghana's value for 2018 was 0.596, medium human development category (142 out of 189 countries)
Population in extreme poverty (below international poverty line)**	8.2% (2017)

*World Bank Estimates, 2019, **Ghana Living Standards Survey, GSS, 2015-2017

2.4 Sociopolitical System

Ghana is a sovereign nation and practices multi-party democracy based on a constitutional arrangement approved by the people in 1992. It is politically stable and has a stable democratic system of governance. Currently all the three arms of government are in full operation. The executive is made up of the President, a Vice President and a constitutionally entrenched cabinet of which the Minister of Health is part. The Legislature comprises a Speaker, two deputy Speakers and 275 Members of Parliament mandated constitutionally to enact laws for the smooth administration of the country.

Ghana has an independent judiciary which is headed by the Chief Justice and comprises the lower courts, High Courts, the Court of Appeal and the Supreme Court. In addition, there are specialised courts that deal expeditiously with specific cases. These include fast-track High Courts, Human Right Courts and Commercial Courts.

In 2019, Ghana expanded administratively from 10 to 16 regions; each region is divided into districts (Figure 2.3). The 16 regions are: Ahafo, Ashanti, Bono, Bono East, Central, Eastern, Greater-Accra, Northern, North East, Oti, Savanna, Upper-East, Upper-West, Volta, Western and Western North. The capital city is Accra, which is in the Greater-Accra region. A Regional Minister, nominated by the President and approved by Parliament, heads each region. A Deputy Regional Minister, who is also appointed by the President and approved by Parliament, assists the minister. Each region has a Regional Coordinating Council headed by the Regional Minister; the council's mandate is to coordinate and formulate integrated district plans and programmes within the framework of approved national development policies and priorities.

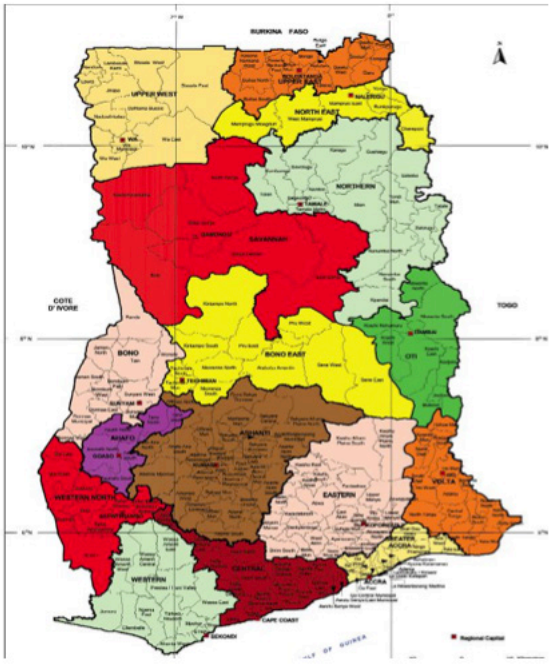


Figure 2.3: Political map of Ghana showing demarcated regions, 2019

Ghana has 260 districts (2019), each headed by a District Chief Executive. The District Chief Executive, the representative of the President in the district, is nominated by the President and approved by a District Assembly. The District Assembly is made up of elected and appointed members and is the highest political and administrative authority in the district

2.5 Organisation of the Health System

2.5.1 National Health Policy and Universal Health Coverage Roadmap

The UHC Roadmap reflects the commitment of the government and people of Ghana to shape the future of health care in Ghana. Government has adopted the Sustainable Development Goals, Global Action Plan for Healthy Lives and Well Being, Declaration on Primary Health Care in Astana (2018), UHC 2030 Compact, initiatives of UHC 2030, and the Political Declaration of UHC adopted at the UN High Level Meeting in September 2019. These provide Ghana with a clear framework for action. Through broad-based consultations and consensus building with various stakeholders, civil society, and private sector and development partners, a set of priority services and interventions has been agreed to be made universally accessible to all persons living in Ghana. It is believed that these actions will serve as a catalyst to transform the country's health systems, efficiently mobilise and apply domestic resources to needs and strategically leverage partner resources for long-term sustainability with the aim of achieving "Ghana beyond Aid".

The National Health Insurance Authority is the main administrative body which oversees the operations of the National Health Insurance Scheme (NHIS) in Ghana. The NHIS, established by an Act of Parliament in August 2003, continues to be the main financing avenue for primary health care.

The UHC Roadmap takes inspiration from the National Health Policy and sets the strategic direction for the health sector in the next 10 years. It also emphasizes health in all policies to motivate action in other sectors for Health and Human Capital Development as articulated in the National Health Policy. Ghana is committed to achieving a critical set of goals, targets and milestones by 2030. These is ambitious but achievable.

Mission of the Ministry of Health (MoH) of Ghana: Contribute to socio-economic development and wealth creation by promoting health and vitality, ensuring access to quality health, population and nutrition services for all people living in Ghana and promoting the development of a local health industry.

Goal of the Health Sector: Ensure a healthy and productive population that reproduces itself safely by ensuring an increased life expectancy, and people who live healthy and productive lives and reproduce without an increased risk of injury or death; reducing the excessive risk and burden of morbidity, mortality and disability, especially in the poor and marginalised groups; and reducing inequalities in access to health.

The government's budgetary support for health based on its commitment to the Abuja Declaration (target of 15%) was 10.4% in 2014 and 7.8% in 2019, over the course of the NMSP 2014-2020. This shows that government increasing its budgetary support in the quest for UHC is key. Also, the NHIS and the government's scale-up of the Community Health Planning Service (CHPS) strategy, which involves placing trained community health officers (CHOs) in communities to provide a package of essential health services including malaria prevention and treatment, have increased access to health care .

The health sector was restructured in 1996 through the Ghana Health Service (GHS) and Teaching Hospitals Act, Act 525. The Act created the GHS and granted autonomy to teaching hospitals. It also refocused the functions of the MoH on leadership, and policy formulation and coordination for the entire health sector including the private and public services. The GHS is responsible for health care delivery and the teaching hospitals are responsible for tertiary care. The MoH carries out its policy formulation function in consultation with the National Development Planning Commission and in partnership with development partners, its department and agencies, and research and other relevant institutions. Policies developed through this collaborative process were informed by the outcomes of sector performance reviews, research findings and technical support provided by the health partners.

In 2012, the Public Health Act 2012, Act 851, was passed to give direction to and facilitate the implementation of essential public health interventions. The Act has nine parts; part four is on vector control (including larviciding) and mandates District Assemblies establish vector control teams to control vectors of public health

importance, including mosquitoes, and establish a 0.5% earmark fund for malaria control. It also prohibits owners of premises from allowing the presence of mosquito breeding sites.

2.5.2 Structure of the health sector

The health sector in Ghana has public and private components. The public sector is run by the GHS, by the MoH through the teaching hospitals and by other government agencies through quasi-governmental health facilities. The private sector comprises faith-based and private-for-profit health institutions (Fig 2.4a).

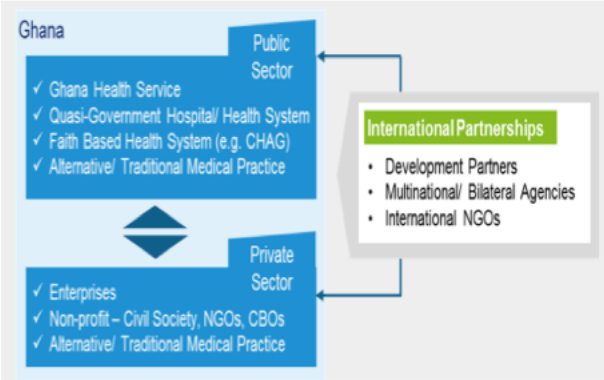


Figure 2.4a: Functional structure of the health system in Ghana

The current health sector is led from the MoH level, supported by the following implementing agencies:

- Service delivery (teaching hospitals, GHS, psychiatric hospitals, Ambulance Service, Blood Service, Christian Health Association of Ghana (CHAG))
- Health training and research institutions
- National Health Insurance Authority
- Health Facilities Regulatory Authority
- Other regulatory bodies

Its structure adheres to the political/ administrative structures of the country from the national to the community level (Figure 2.4b) The GHS is a three-tier health delivery system of primary, secondary and tertiary levels. The primary level is the district level where a district hospital with a medical doctor serves as a district referral centre for health centres in the sub-districts (with Physician Assistants in charge) and for the CHPS (with CHOs). In some sub-districts and communities, there are CHPS zones (catchment area of 5-8km radius; 750 households; or 5000 population) where the CHOs work with community volunteers to increase access to health care in their communities. A typical district with a population of 100,000 has one hospital, five health centres and 10-15 CHPS zones.

Figure 2.4b: Organisational structure of Ghana's health system

A District Director of Health Services leads the district and works with a District Health Management Team (DHMT). He/she reports administratively to the District Chief Executive (Political Head) and technically to the Regional Director of Health Services.

The regional hospital serves as the referral level for secondary care and is run by general practitioners and specialists. There are currently 10 regional hospitals receiving referrals from districts and providing outreach support to districts. Six new regional hospitals are expected, following the creation of the six new regions. The Regional Director of Health Services oversees all matters of health in the region, works with a team and reports administratively to the Regional Minister (Political Head) and technically to the GHS Director General, who reports to the Minister of Health through a Council.

Cape Coast, Komfo Anokye, Korle-Bu, Ho and Tamale teaching hospitals are the public teaching hospitals which provide tertiary care and doctor training. A few private teaching hospitals are emerging. The Chief Executives of the teaching hospitals report to the Minister of Health through a Board.

2.5.3 Delivery of health services

The health sector uses an integrated approach in delivering health interventions. Preventive care, clinical care and emergency services are all important aspects of the health service delivery system. As part of the approach, public health interventions are packaged and delivered in communities as part of CHPS and outreach, in health facilities and at district, regional and national levels. There are multi-purpose disease control technical officers at district and regional levels who ensure integrated health service delivery. These officers report to their respective district and regional directors of Health. At the sub-district and CHPS compounds, disease control technical officers, field technicians, community health nurses, midwives and medical assistants carry out malaria control activities as part of their schedule of work.

The NHIS (under the National Health Insurance Act 650, 2003 and LI 1809, 2004; and Act 852, 2012) reimburses the cost of health care services in health facilities nationwide.

A Traditional Medicine department has been created within the sector. Its functions include setting of standards, issuing of certificates of registration to qualified traditional medicine practitioners and licensing their premises.

The private health sector also plays a very important role in the health service delivery including implementation of strategies for malaria control. The NMCP engages both the public and private health sectors in all its activities.

2.5.4 The procurement and supply chain system

The NMSP 2021-2025 contains strategies aimed at strengthening the NMCP Procurement and Supply Chain (P&SC) System. Since the NMCP is part of the GHS system, executing the strategies calls for advocacy, support and collaboration with relevant GHS Directorates, Divisions and Partners, and alignment with the MoH National Supply Chain Master Plan 2021-2025. This requires the implementation and sustainability of all supply chain reforms including Last Mile Distribution and Warehouse Improvement and Framework Contracting Arrangements, as well as capacity building for staff involved in the supply chain.
To achieve an efficient supply chain system and commodity security for malaria control, availability of funds cannot be over-emphasised. The funding gap leads to erratic supply of commodities, even stock-outs, which have a negative impact on malaria control activities and interventions.

Other supply chain bottlenecks are inadequate numbers of skilled personnel and high staff turnover and operational challenges such as poor data capturing and reporting, which results in inaccurate forecasting and supply planning. The development of the Ghana Integrated Logistics Management System (GhiLMIS) presents an opportunity to improve malaria supply chain data capture notably consumption data and reporting for decision making. The NMCP will therefore advocate and support the effective roll-out and use of the GhiLMIS to ensure the desired benefits are realised.

Generally, there are few stock-outs at the central and regional levels. When these do occur, they can have an impact at the facility level. However, stock-outs and erratic flow of health products at the service delivery points occur even when the central and regional stores are stocked according to plan and they are mostly attributable to weakness in the procurement processes, poor inventory management practices and poor supervision at the sub-national – regional medical stores (RMS) and health facility – level.

Despite improvements in warehousing conditions across all 10 RMS, storage space for some malaria commodities, particularly long-lasting insecticidal nets (LLINs), continues to be a challenge. Like other commodities, LLIN distribution runs from the central level to the district level, where facilities pick up the nets. Failure to integrate this commodity into the mainstream distribution system affects its availability at service delivery points.

Quality assurance is an integral part of efficient supply chain management. Currently, the Ghana Food and Drug Administration (FDA) can easily and routinely sample consignments at points of entry and manufacturing sites for quality analysis, but post-market surveillance remains a major challenge. Lack of funding prevents the FDA from assuming a fully robust quality assurance role. The NMCP will therefore advocate for the strengthening of quality assurance systems.

2.5.5 Health sector financial management

The Public Financial Management Act, 2016 (Act 921), the Accounting Treasury and Financial Reporting Rules and Instructions and the Ghana Integrated Financial Management Information System are the key guides to the accountability of funds received and managed in the health sector. In addition, for efficiency of disbursements of funds, project and grant agreement documents provide guidance on fund disbursements, accounting and reporting. These government and donor partner documents together provide regulations and guidance on how public funds should be managed including revenue receipts, expenditure, records, auditing and so on.

2.5.6 Funding of the health sector

The three main sources of health sector financing in Ghana are: Government of Ghana or the public sector, development partners, and the private sector, including households. Funding is channeled to the sector through a variety of mechanisms as summarised in Figure 2.5.

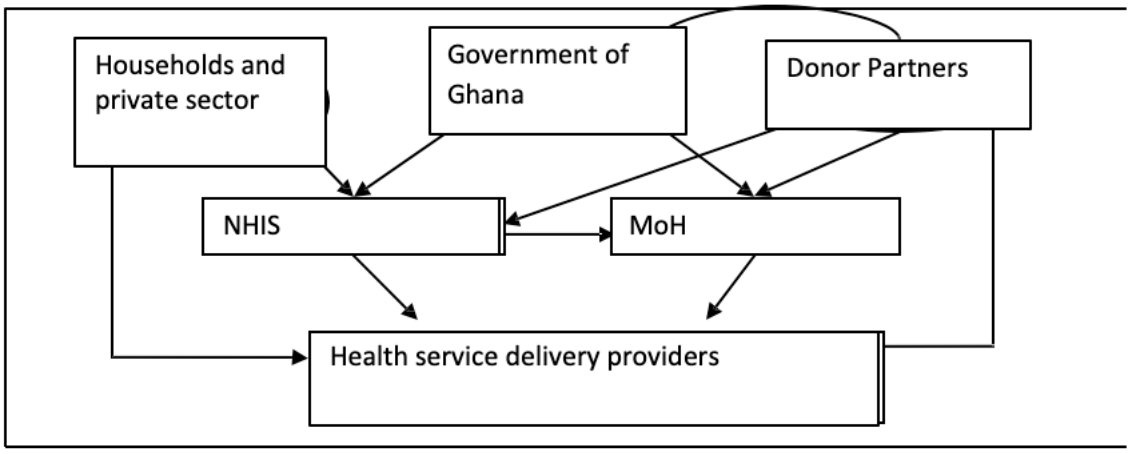


Figure 2.5: Main sources of finance for the health sector in Ghana

Government funding follows two main routes. First, discretionary funds are allocated to the sector through the MoH as part of the routine budget. Second, statutory funding is allocated to the governing body of the National Health Insurance Authority and the National Health Insurance Council, in the form of the National Health Insurance Fund.

The National Health Insurance Fund is funded from several sources: the National Health Insurance Levy, a 2.5% levy on goods and services collected under the Value Added Tax, 2.5 percentage points of Social Security and National Insurance Trust contributions per month, premiums paid by informal sector subscribers and

returns on Fund investments. Government contributions complement these funding sources by covering the premiums for certain population groups: over two-thirds of total NHIS membership covers those who are exempted from premium payment, including those age 70 years and above, children under 18 years and pregnant women.

Development partners also provide funding to the health sector. The Sector-Wide Approach has evolved towards a move to increase the use of government systems as agreed under the Paris Declaration and re-affirmed in the Accra Agenda for Action. Consequently, partners that earlier supported the MoH Health Fund have moved either to Multi-Donor Budget Support (i.e. general support of the Government of Ghana) or to Sector Budget Support, which is channeled to the MoH through the Ministry of Finance and Economic Planning (MoFEP). In addition, a significant number of development partners provide earmarked funding for specific activities. These include bilateral and multilateral programs, as well as international health initiatives such as the Global Fund and the Global Alliance for Vaccines and Immunisations (GAVI). Partners provide earmarked funding through a combination of grants and loans. The range of partners is expanding to include bilateral arrangements with additional countries, and partnerships between governments and financing institutions, particularly for infrastructure projects.

Health facilities have relied on Internally Generated Funds, such as Cash & Carry and user fees, to supplement funding from other sources for over a quarter of a century. The government granted the facilities dispensation from the requirement to submit all such revenues back to the treasury so the facilities can use the moneys to improve their service provision. With the introduction of the NHIS, the level of Internally Generated Funds (as reported by facilities) has increased significantly. However, a distinction must be made between direct household contributions such as Cash & Carry and user fees, which are a net addition to the sector resource envelope, and NHIS claims revenue, which comes primarily through the statutory budgetary allocation to the Insurance Fund, supplemented to a limited extent through premium contributions of informal sector employees.

2.5.7 Accounting and reporting

All accounting and reporting procedures of the MoH are guided by the new Public Financial Management Act, 2016 (Act 921) and the Accounting, Treasury and Financial reporting rules and instructions. The NMCP, as part of the GHS and MoH, also adheres to the rules and guidelines governing accounting and reporting as per the above-mentioned regulatory acts.

In all GHS facilities, authorised bank accounts are opened in line with the Public Financial Management Act. All funds received are deposited into the designated bank account(s) and disbursed from these accounts. All disbursements are approved by the head of department and authorised by the head of finance. Authorisation involves checking to ensure there is a budget available for the activity and whether the budget is approved. Authorisation also involves checking to ensure that the activity is being performed according to specification and that all details on the payment documents are accurate and attached.

In most cases payment vouchers are pre-audited by internal auditors or designated officer(s) who do compliance checks before the transfers are made to designated recipients. Programme activity budget ledgers are maintained to track the movement of funds on key programmes and activities. In addition, Standard Operating Procedures have been developed to guide retirement and transfer of funds at both national and regional levels.
Global Fund grants, however, have separate accounts which are managed to align with government accounting mechanisms. USAID uses a different accounting system in line with the U.S. Government policies as per the bilateral agreement

2.6 National Malaria Control Programme

The NMCP is situated within the Disease Control Department of the GHS Public Health Division. At the national level, this division is one of 10 that report to the Director General (Figure 2.6).

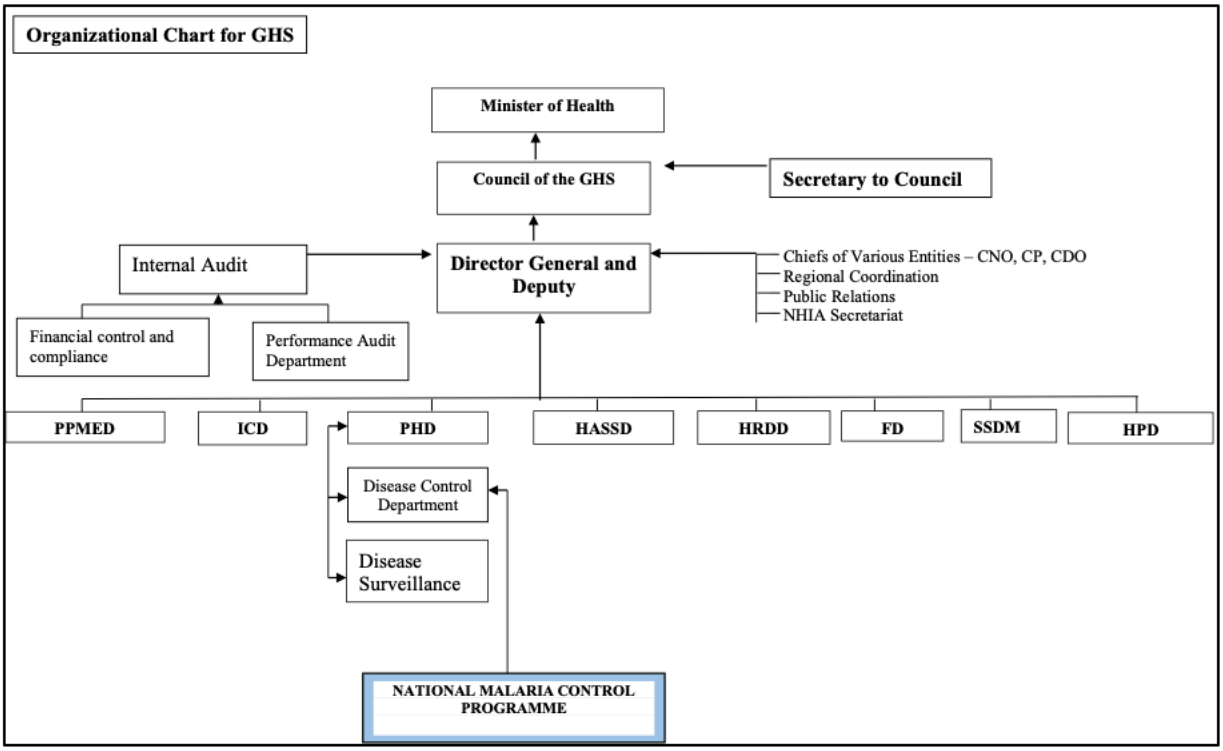


Figure 2.6: Location of NMCP within the GHS

The NMCP is mandated to coordinate all activities pertaining to the control of malaria in the country and ensure that all stakeholders and partners align with the NMSP, which guides implementation of the malaria control interventions.

As illustrated in Figure 2.7, the NMCP has a Programme Manager, who is assisted by a Deputy Programme Manager. At the national level, the programme has administrative units (Administration, Accounts, IT, and Resource Mobilisation) and programme management units (with technical and support staff). In addition, there is an Entomologist, and focal persons for specific technical areas such as malaria case management, malaria in pregnancy (MIP), procurement supply management, social behaviour change communication (SBCC), partnerships, private sector and resource mobilisation, and monitoring and evaluation (M&E). The administrative units have staff consisting of an administrator, secretaries, finance officers and drivers.

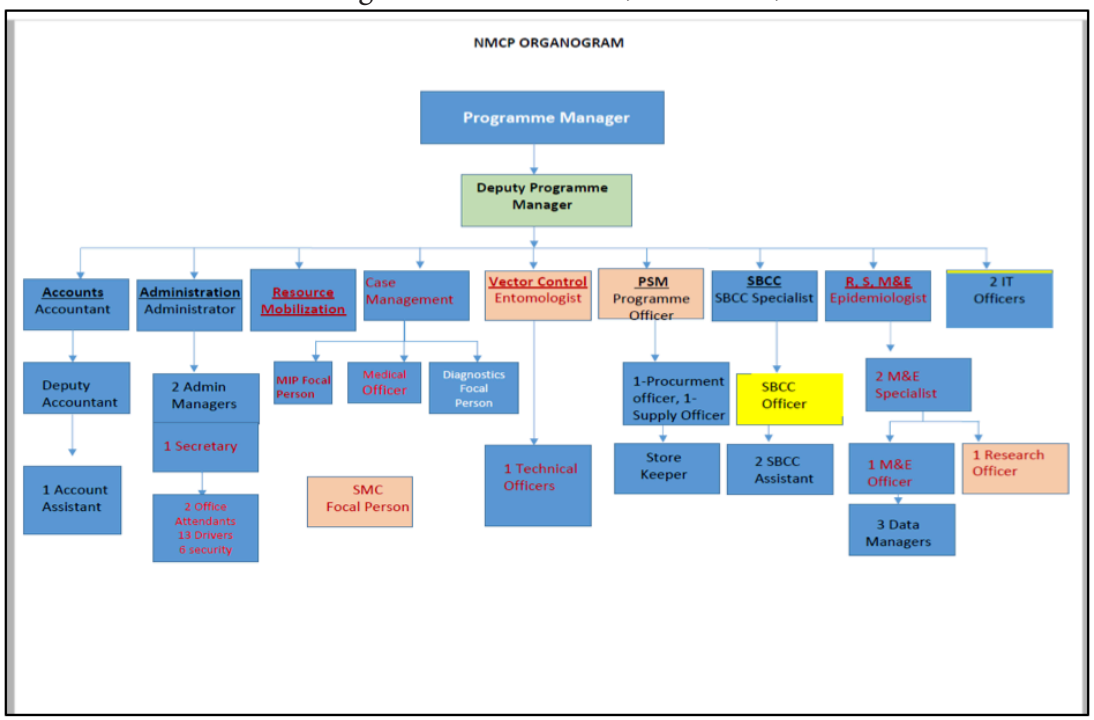


Figure 2.7: NMCP organisational structure, 2019

3. MALARIA SITUATION ANALYSIS

3.1 Historical Perspective of the Malaria Problem

Malaria control initiatives started in Ghana during the colonial era. Intensive government efforts at controlling malaria led to the creation in 1957 of a malaria control unit in the MoH. Its work started in the Volta region in collaboration with WHO to train personnel in geographical reconnaissance and malariometric and entomological surveys, and to conduct trials of indoor residual spraying (IRS) of insecticide to control the adult mosquito population. In 1961, the National Malaria Service was created when the country adopted the global Malaria Eradication Programme, which used IRS and larviciding to control malaria vectors. The service, however, was discontinued in 1967 due to inadequate technical and financial resources.

Key milestones in Ghana's national efforts at controlling malaria are summarised below:

- 1957: Creation of a malaria control unit within the MoH.
- 1961: Creation of a National Malaria Service after Ghana adopted the global Malaria Eradication Programme, which used IRS and larviciding to control malaria vectors. The service was discontinued in 1967 due to inadequate technical and financial resources.
- 1992: Launch of a five-year (1993-1997) National Malaria Control Action Plan that focused on building capacity for improved disease management in health facilities.
- 1998: Commitment by Ghana to the Roll Back Malaria Initiative, which builds on the Global Malaria Strategy with a focus on Africa and marked the initiation of malaria control in 30 districts focusing on case management.
- 2000: Commitment by Ghana to the Abuja Declaration on Roll Back Malaria in Africa and the Millennium Development Goals.
- 2000: Development of NMSP, 2000-2008.
- 2002: Round 2 of Global Fund support of selected malaria control interventions in 20 districts.
- 2004: Round 4 of Global Fund support for countrywide scale-up of interventions.
- 2006: Commitment by Ghana to malaria elimination.
- 2008: Development of NMSP, 2008-2015.
- 2014: Development of NMSP, 2014-2020.
- 2015: Commitment to the UN Sustainable Development Goals.
- 2020: Development of NMSP, 2021-2025.

3.2 Epidemiology

3.2.1 Malaria parasites

Plasmodium falciparum (Pf) is the predominant malaria parasite causing severe morbidity and mortality in Ghana. Pf mono-infection is the most prevalent type of malaria infection in all regions, ranging between 89.0% in the Eastern region and 98.8% in the Ashanti region with a national average of 96.3% .The second most prevalent infection type is Plasmodium malariae (Pm) mono-infection ranging between 0.1% in the Upper West region and 8.9% in the Eastern region with a national average of 1.6%. Prevalence of Plasmodium ovale (Po) mono-infection ranged between 0.2% in the Ashanti region and 1.9% in the Upper East region with a national average of 1.0%. Mixed infections of Pf+Pm and Pf+Po are prevalent at 0.3% and 0.8%, respectively. P. vivax has not been reported from health facilities or identified in any part of the country.

3.2.2 Malaria vector distribution and resistance to insecticides

An. gambiae s.l. and An. funestus have been identified as the major malaria vectors in all ecological zones of the Northern Savannah, Middle transitional and Southern zone. They account for about 95% of all Anopheles mosquitoes collected. An. gambiae s.s. of the complex predominates and is found across the country (Figure 3.1). An. arabiensis has been found in the Sahel zone but in fewer numbers. These species are highly anthropophilic, biting mostly late in the night, and are commonly found in the rural and peri-urban areas where socio-economic activities create conducive breeding sites.

Figure 3.2 illustrates the distribution of mosquito resistance to pyrethriod insecticides and potential areas for use of piperonyl butoxide (PBO), a synergist that counteracts the resistance. Pyrethroid resistance is generally found nationwide but is concentrated in the coastal, middle and northeastern zones.

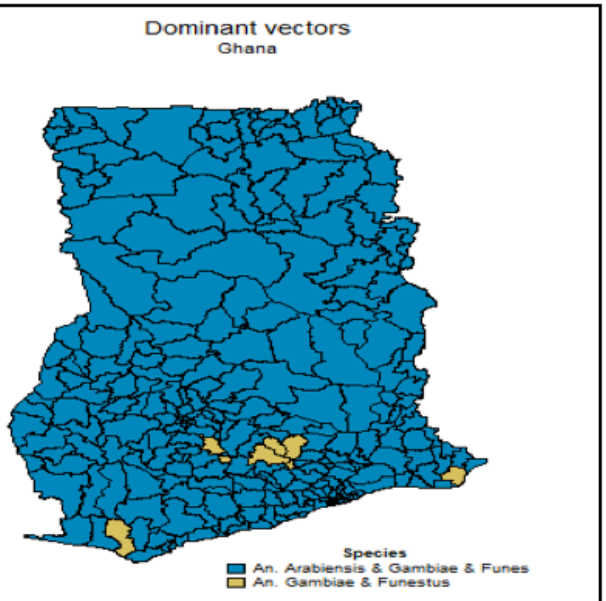


Figure 3.1: Distribution of the dominant malaria vectors in Ghana (Source: Global Malaria Program, WHO, 2019)

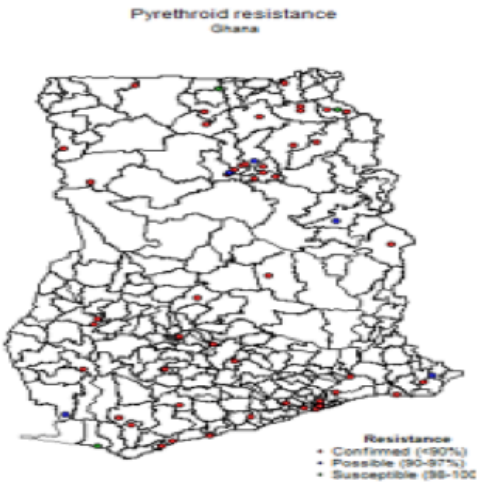


Figure 3.2: Distribution of pyrethroid resistance by malaria parasite in Ghana

3.2.3 Distribution of malaria

3.2.3.1 Distribution by region

Malaria transmission is generally stable in Ghana with varying endemicity across regions. Parasite prevalence in children under 5 years has decreased from 27.5% in 2011 to 14.1%, with prevalence ranging from approximately 2.4% in Greater Accra to 27.0% in the Western region (Figure 3.3) .

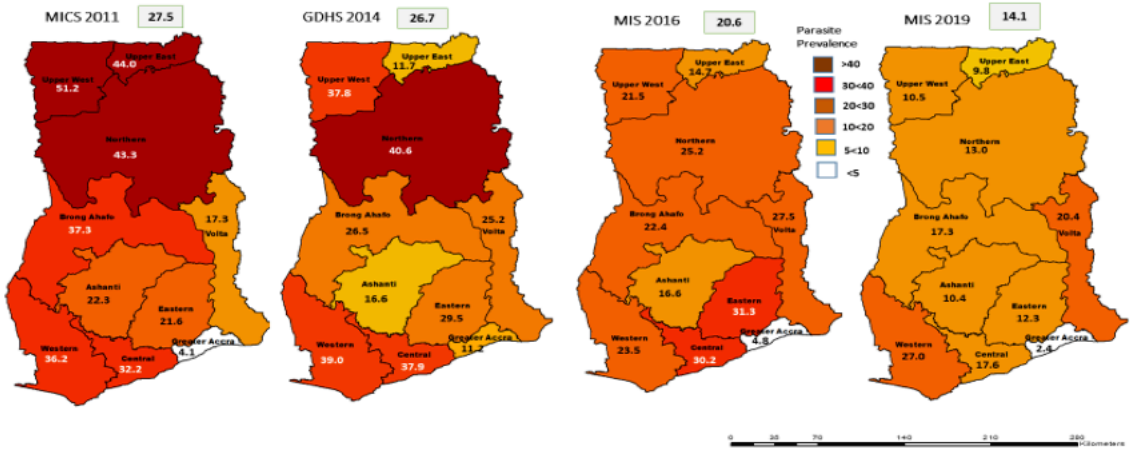


Figure 3.3: *Percentage of children age 6-59 months who tested positive for malaria by microscopy by region, 2011-2019* Source MIS 2019

3.2.3.2 Distribution by rural/urban location

Malaria prevalence in children is higher in rural households than in urban households (Figure 3.4).

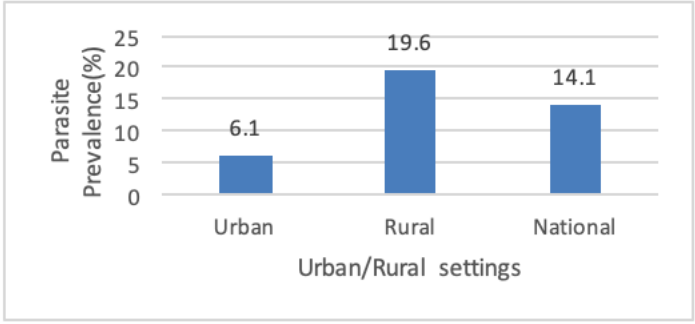
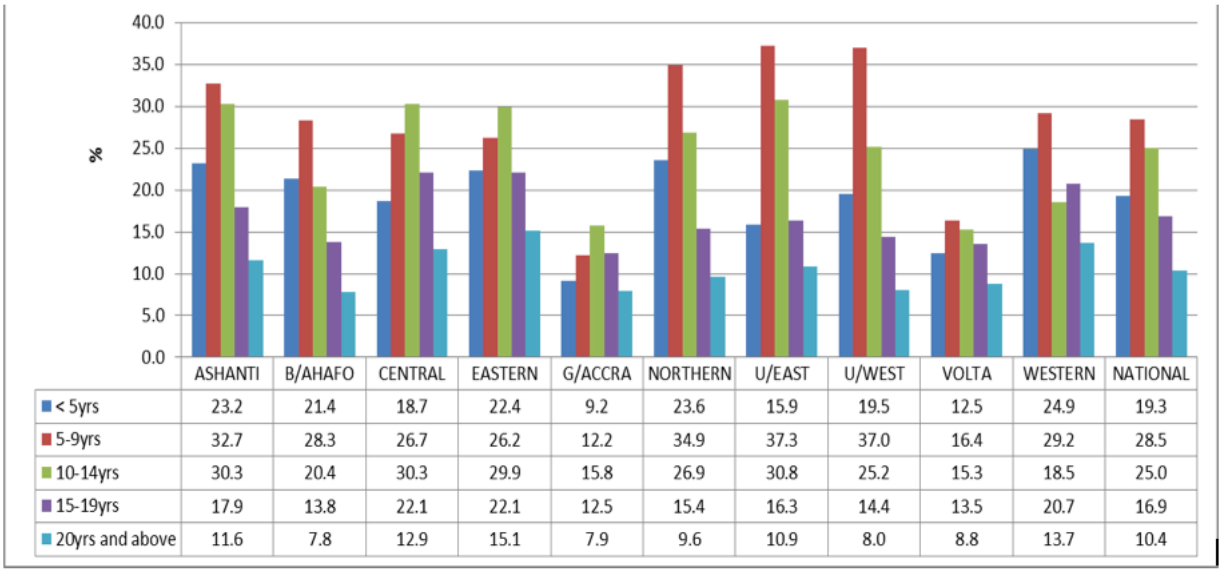


Figure 3.4: Percent children age 6-59 months who tested positive for malaria by microscopy by urban/rural distribution
Source MIS 2019

3.2.3.3 Distribution by age

In 2018, distribution of malaria by age was highest in patients age 5-9 years (28.5%) followed by patients age 10-14 years (25.0%) (Figure 3.5). This pattern was observed in seven regions: Ashanti, Brong Ahafo, Northern, Upper East, Upper West, Volta and Western .



	ASHANTI	B/AHAFO	CENTRAL	EASTERN	G/ACCRA	NORTHERN	U/EAST	U/WEST	VOLTA	WESTERN	NATIONAL
< 5yrs	23.2	21.4	18.7	22.4	9.2	23.6	15.9	19.5	12.5	24.9	19.3
5-9yrs	32.7	28.3	26.7	26.2	12.2	34.9	37.3	37.0	16.4	29.2	28.5
10-14yrs	30.3	20.4	30.3	29.9	15.8	26.9	30.8	25.2	15.3	18.5	25.0
15-19yrs	17.9	13.8	22.1	22.1	12.5	15.4	16.3	14.4	13.5	20.7	16.9
20yrs and above	11.6	7.8	12.9	15.1	7.9	9.6	10.9	8.0	8.8	13.7	10.4

Figure 3.5: Age specific malaria prevalence in sentinel sites by region, 2018 Source: MPR, 2019

3.2.3.4 Distribution by season

The trend in monthly suspected and confirmed malaria cases at the national level from January 2014 to October 2019 is shown in Figure 3.6. This overall pattern has remained similar over the years, with cases increasing from April and peaking in October/November. Most years have recorded minor peaks in May/June. This coincides with rainfall , which in much of the southern areas intensifies in April /May and in October.

In the northern savannah, where the rains start in June and end in October, the seasonal pattern of malaria is completely different from in the southern zones, as illustrated in Figure 3.7.

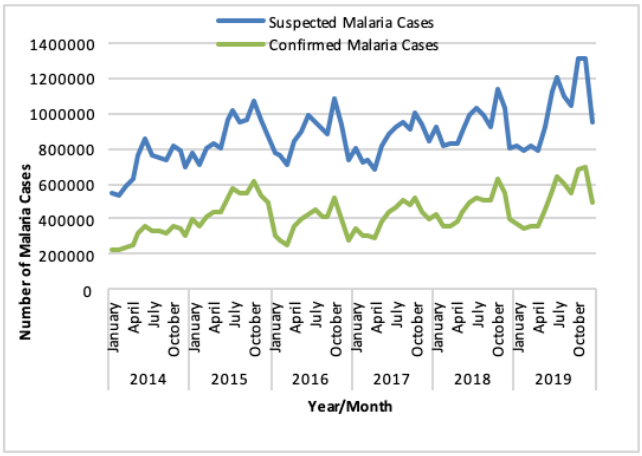


Figure 3.6: Monthly trend of malaria cases in Ghana, 2014-2019 (Source: DHIMS, 2019)

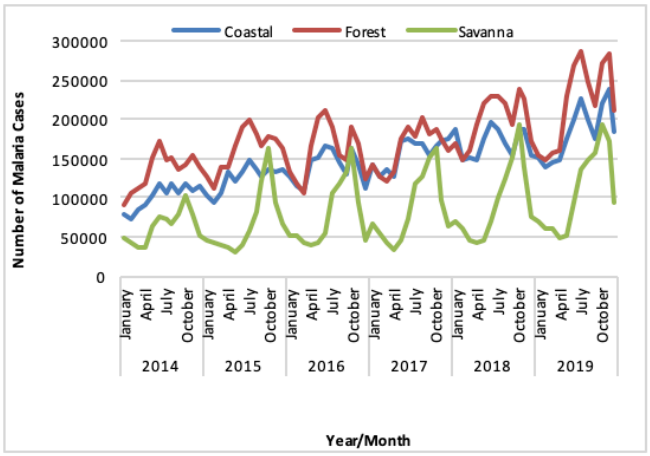


Figure 3.7: Monthly trend of malaria cases in Ghana by ecological zone, 2014-2019 (Source: DHIMS, 2019)

3.2.4 Trends in Entomological Inoculation Rate and changes in vector behaviour

3.2.4.1 Entomological Inoculation Rate

The micro-geographical and seasonal variations in the biting and the level of malaria transmission observed in many areas showed that malaria transmission is heterogeneous in Ghana. The Entomological Inoculation Rate (the average infective bite an individual will receive from a mosquito per unit time) ranges from 418 in the north of the country to about 20 in the south.

Intensity of transmission is highest in the north, followed by the middle and then southern zones, as shown in Figure 3.8. In the former Northern region for instance, the U.S. President's Malaria Initiative (PMI) reported a decline in Entomological Inoculation Rates, attributable to seven years of IRS. Malaria transmission in the northern savannah was highly seasonal, with relatively high transmission occurring between June and October. The assessment, however, reported a general decline in the Entomological Inoculation Rate of about 86% in 2017 compared with 2016 .

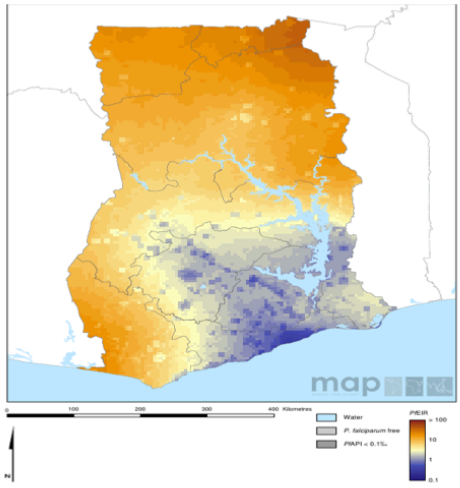


Figure 3.8: Risk of malaria transmission across Ghana's ecological zones, based on Entomological Inoculation Rate Source: www. map.ox.ac.uk

3.2.4.2 Malaria vector behaviour

Studies across the country show that biting by An. gambiae s.s., the main malaria vector, is continuous throughout the night and usually peaks between 22:00 hours and 04:00 hours. Additionally, both An. gambiae s.s. and An. funestus bite both inside and outside living/sleeping structures, in some cases almost equally . Adapting control strategies targeting outdoor biting by vectors is thus imperative if malaria is to be eliminated. In addition, the dominant malaria vectors have been found to mainly rest indoors after feeding, suggesting that using IRS, which targets indoor resting mosquitoes, is an effective control strategy and this is why it has been adopted to complement the use of LLINs. It is also important to note that this indoor resting vector behaviour could be changing in areas which receive IRS over many years, where mosquitoes now are found mostly resting outside of living/sleeping structures17. This increased outdoor biting may allow malaria transmission to continue even if LLINs are fully scaled up and thus presents programmatic challenges to the current LLIN intervention.

3.2.5 Malaria stratification and mapping

Ghana is one of 11 countries which contribute to 80% of the world's malaria burden and thus it is included in the High Burden High Impact Initiative. One of the pillars of this initiative is the use of strategic information for decision making. In this regard, Ghana had to be stratified according to the malaria burden at the district level. The stratification aimed to ensure the implementation of appropriate, epidemiological context-specific interventions, to maximise impact.

In 2019, Ghana's NMCP with WHO and other stakeholders conducted a stratification to elucidate the variation in malaria transmission across the country and adapt and improve malaria control and prevention interventions that are the best fit for the microepidemiology.
The analysis involved two main steps:

1. A stratification of districts was implemented based on important epidemiological metrics (parasite prevalence, malaria incidence, and all-cause mortality in children under the age of 5 years).
2. The epidemiological information was combined with district-level measures of entomology, insecticide resistance, seasonality, urbanisation, and access to care to identify core interventions to be implemented in each district.

The heat maps in Figure 3.9 show incidence, prevalence and all-cause under-5 mortality of malaria by location and magnitude, and malaria risk factors and determinants.

3.2.5.1 Incidence of malaria

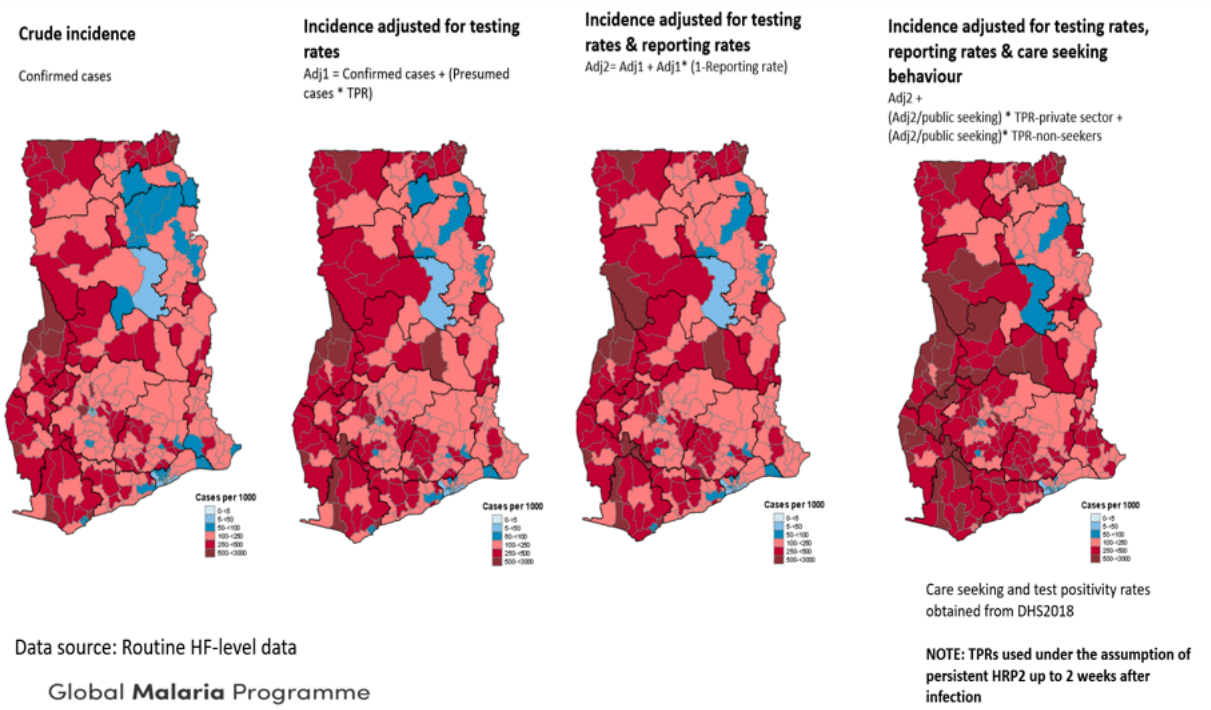


Figure 3.9: Incidence of malaria in Ghana

3.2.5.2 Prevalence of malaria

Using geospatial methods, P. falciparum parasite prevalence (PfPR) data were combined with climatic variables to produce estimates of parasite prevalence per year (2000-2018) by districts in the presence and absence of interventions. The PfPR estimates were standardised to the age group 2-10 years (PfPR2-10), the peak age range for infection. Parasite prevalence data were obtained from research and national household surveys. Intervention data were estimated from distribution and population coverage data. The University of Oxford's Malaria Atlas Project did the analysis. The estimates for 2015-2018 are shown in Figure 3.10.

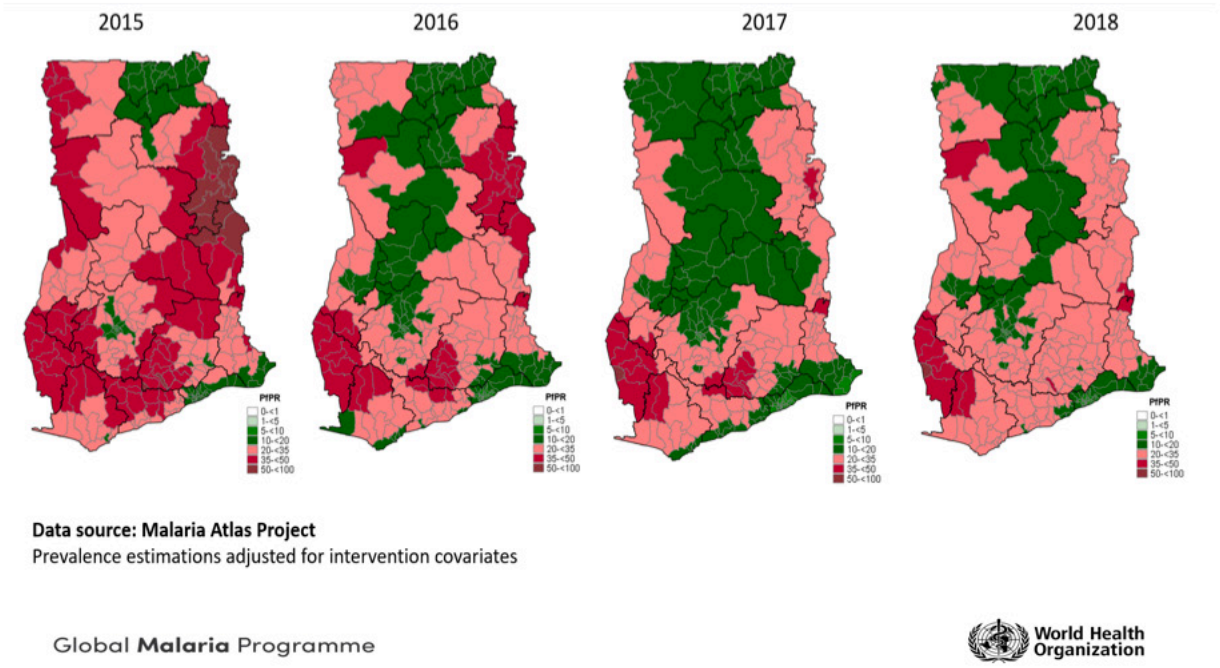


Figure 3.10: Prevalence of malaria in Ghana Source: https://map.ox.ac.uk

3.2.5.3 Combination of Indicators-incidence, prevalence and under-5 mortality

A combination of all the indicators (incidence, prevalence and all-cause under-5 mortality) to guide prioritisation of actions is shown in Figure 3.11.

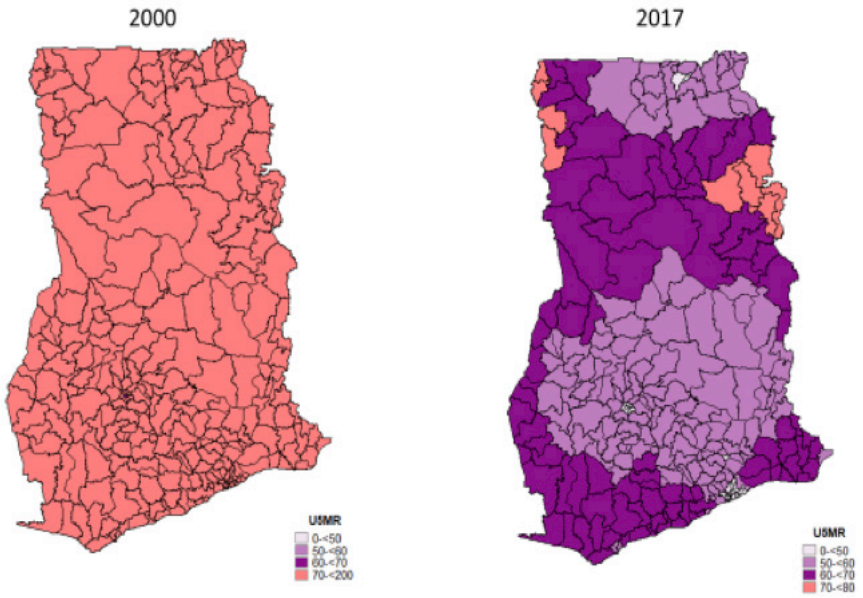


Figure 3.11: All-cause under-5 mortality of malaria in Ghana

3.2.5.4 Stratification by combination of indicators

Based on the prevalence and incidence categories of districts in 2018, scores were assigned and summed up. These scores were used to stratify the districts based on the combined scores. The first set of strata according to prevalence and incidence scores were obtained and used to generate new scores. In addition, the under-5

mortality rate estimates for 2017 were added to the combined prevalence and incidence strata scores to obtain a final composite set of strata which included prevalence, incidence and under-5 mortality rate (Figure 3.12).

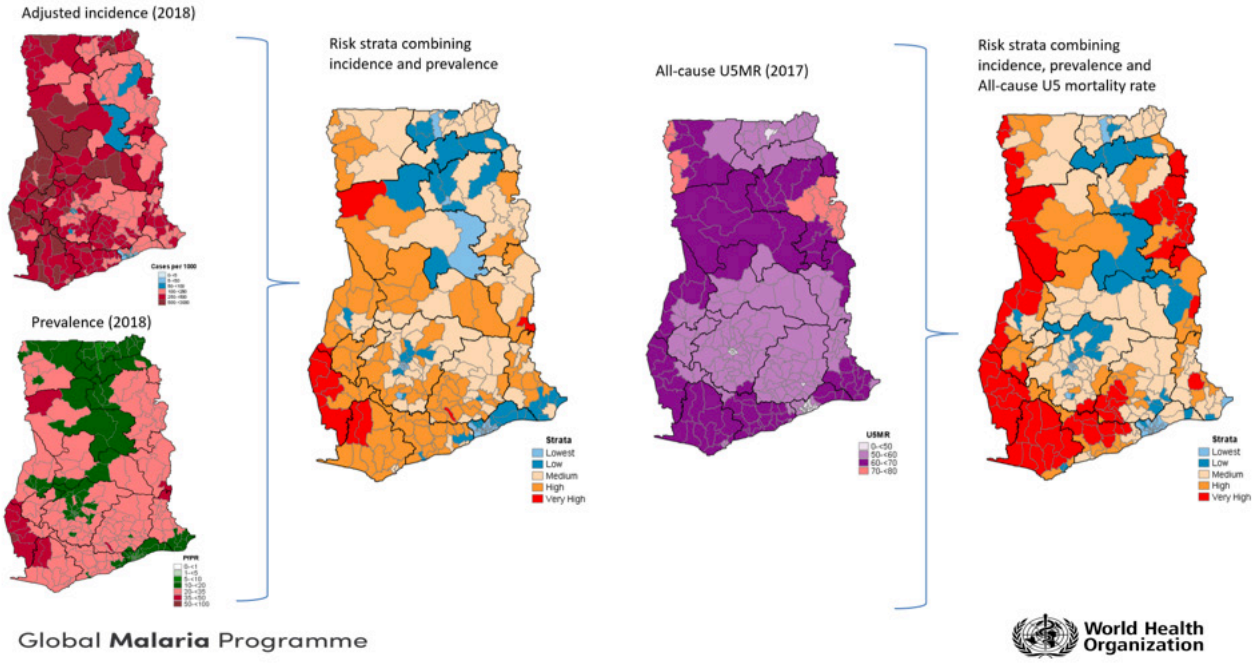


Figure 3.12: Stratification by combination of indicators

3.2.5.5 Seasonality and access to services

As was discussed in Section 3.2.3.4, Ghana has two main seasonal patterns for malaria transmission, as illustrated in Figure 3.13. Most northern areas get 65% of their rainfall in four consecutive months, around June to October. Rain in the south is less seasonal, but these areas get their heaviest rains in April/May and October. This is the rationale and basis for the national SMC.

Access to malaria services by the population is indicated in Figure 3.14. Access to services is generally better in the south.

Seasonality	***Access to health services***

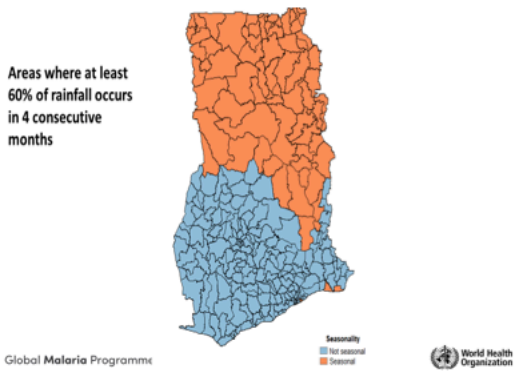
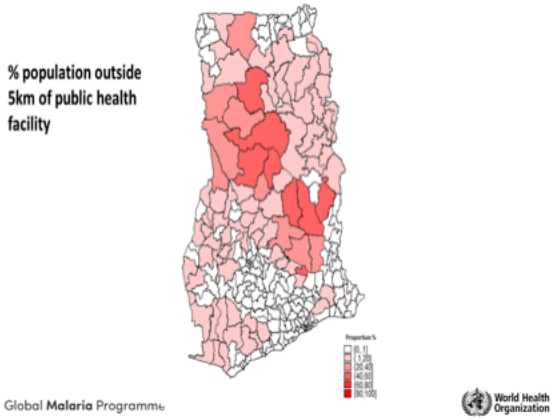

	

Figure 3.13: Seasonal patterns of rainfall in Ghana	Figure 3.14: Access to malaria services by geographical location, Ghana

3.2.5.6 Intervention mix

The stratification of different malaria indicators can guide the prioritisation of interventions and allocation of resources. This stratification was duly considered in guiding the NMSP 2021-2025 selection and prioritisation of strategic interventions for specific geographic areas and populations. Figure 3.15 indicates areas to which IRS was provided in 2018 based on two indicators: their PfPR-10 of >35 and adjusted incidence of more than 500 cases per 1000.

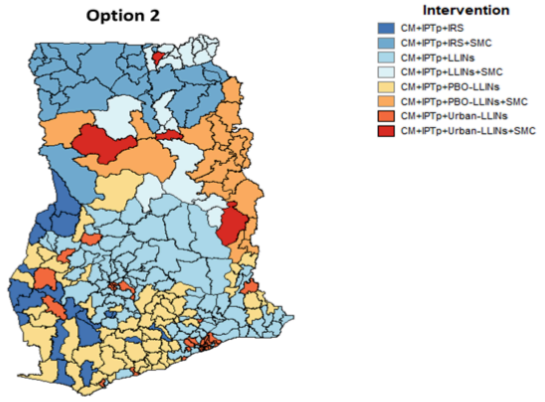


Figure 3.15: Intervention mix based on stratification of indicators

3.2.5 Morbidity and mortality

Figure 3.16 shows trends and distribution of uncomplicated suspected malaria cases seen at health facility outpatient departments, the number who were tested, the number who tested positive as well as the number of cases treated with artemisinin-based combination therapies (ACTs). In general, the number of suspected malaria cases tested and confirmed increased from 8,453,557 in 2014 to 12,125,118 in 2019. In addition, the proportion of outpatient malaria cases treated with ACTs decreased from approximately 82% in 2014 to 48% in 2019 as a result of improved testing rates in all regions and improvement to adherence to the treatment guidelines.

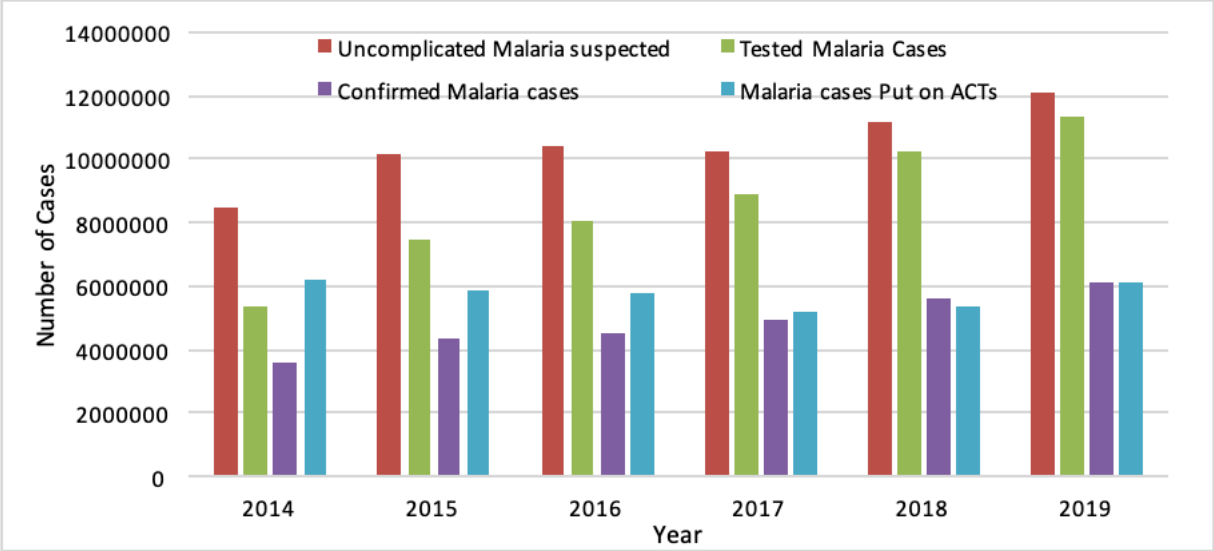


Figure 3.16: Number of outpatient suspected malaria cases tested, outcome of testing, and treatment with ACT, 2014-2019

Interestingly, though the proportion of suspected outpatient malaria cases tested increased from 73.5% in 2014 to 93.7% in 2019, the proportion of cases treated with ACTs decreased from 82.3% in 2014 to 48.4% in 2018 (Figure 3.17). This could potentially be the benefit of the test-and-treat policy with effective case management for individual patients and improved efficiency in use of resources nationally.

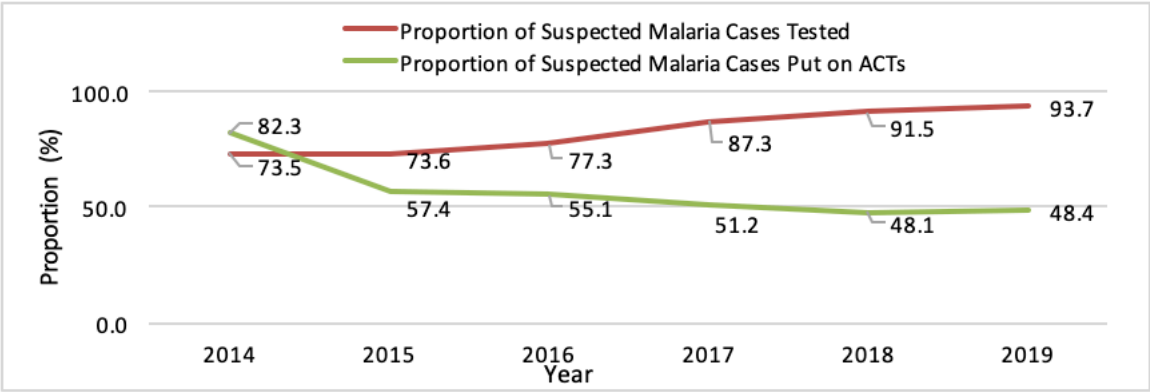


Figure 3.17: Proportion of suspected outpatient malaria cases tested and treated with ACTs, 2014-2019

Overall, malaria testing rates have improved in all regions and this has resulted in decreased ACT treatment of suspected cases. Using two of the regions studied for the MPR 2019, the malaria testing rate increased in Brong Ahafo from 67.8% in 2014 to 98.4% in 2019 and test positivity declined from 75.6% to 58.0% in the same period (Figure 3.18). In the Central region, the testing rate increased from 65.8% in 2014 to 94.7% in 2019 (Figure 3.19).

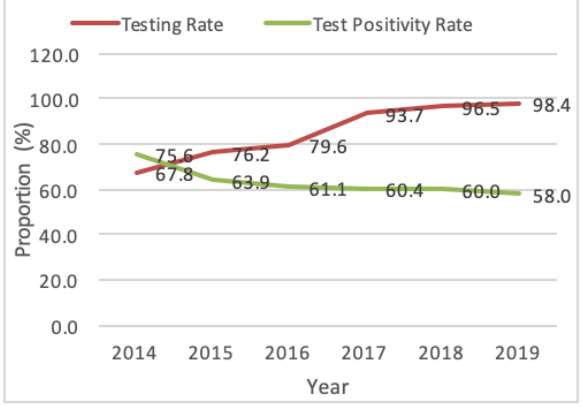


Figure 3.18: Malaria testing rate and test positivity rate, Brong Ahafo region, 2014–2019 Source: DHIMS 2, Dec. 2019

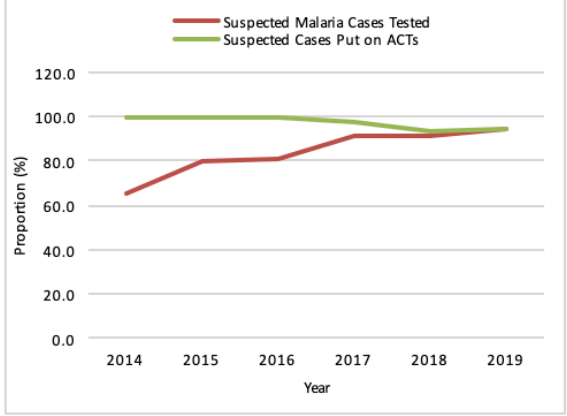


Figure 3.19: Case management cascade data for all facilities in Central region, 2014–2018 Source: DHIMS 2, Dec. 2019

3.3 Review of the NMSP 2014-2020

3.3.1 Overview of the NMSP 2014-2020

Work on the "Strategic Plan for Malaria Control in Ghana 2014-2020", which has been the operational document for guiding malaria control in Ghana for the past six years, began in 2013 and concluded in May 2014. The document, developed by the MoH, GHS, and NMCP, was informed by lessons learnt during the implementation of a 2000-2010 national malaria strategy that adopted the Roll Back Malaria goal of reducing the malaria disease burden by 50% by 2010, and the Abuja Declaration of May 2006, which aimed to achieve and sustain universal access to appropriate interventions for all populations at risk of malaria; it also adopted lessons from the previous NSP 2008-2015.

Based on all the lessons learnt, the Goal of the NMSP 2014-2020 was to reduce the malaria morbidity and mortality burden by 75% (using 2012 as baseline) by 2020.

3.3.2 Main findings of the MPR

The MPR 2019 assessed NMCP capacity in terms of:

The implementation rate: proportion of planned activities implemented (fully, partially and not) under each objective. The rate was high if >90% of activities was fully implemented; moderate if 75-90% was fully

implemented and low if <75% was fully implemented.
Out of 218 NMSP planned activities, 88.1% were fully implemented, 10.6% were partially implemented and only 1.4%, most out of MNCP control, were not implemented according to criteria set .

Objective 1: Protect at least 80% of the population at risk with effective malaria prevention interventions by 2020.

Vector Control

Findings

- Malaria transmission is generally stable in Ghana with varying endemicity across the regions.
- Parasite prevalence has reduced e.g. from 27.5% in 2011 (MICS, 2011) to 14.1% in 2019 (MIS, 2019).
- Increased LLIN ownership from 68% in 2014 to 73.7% in 2019; children under 5 years who slept under an ITN the previous night increased from 46% in 2014 to 54 % in 2016 and pregnant women who slept under an ITN the previous night increased from 46% in 2014 to 48.7% in 2019.
- Individuals who slept under an ITN the previous night increased from 37% in 2014 to 43% in 2019.

Challenges

- Poor collaboration with other departments on vector management.
- Vector control is not implemented in the context of Integrated Vector Management.
- Poor waste management of malaria commodities including disposal of used LLINs.
- IRS is an expensive intervention to deploy (i.e. logistics and infrastructure).
- Impact of use of LLINs depends largely on people's attitude.
- Distribution of LLINs in urban areas is usually a challenge.
- Development of resistance by vector to insecticide is a major challenge.

Key Recommendations

- Add on control strategies that target outdoor biting vectors.
- Target interventions based on research data.
- Promote the integrated vector and communicable disease approach including addressing vector resistance to insecticides.
- Strengthen national and sub-national entomological capacities for vector surveillance, forecasting and intervention monitoring, and integrate them with public health surveillance systems.

Seasonal Malaria Chemoprevention (SMC)

Findings:

- In 2016, an average 81.7% of the target populations were reached in the two Upper regions with two rounds of doses due to challenges encountered with the supply of the medicines.

- The drugs used were safe with 11-14% of children in each round experiencing adverse events, which were mostly self-limiting and mild.
- At least 80% of the targeted population in the years up to 2019 had been given effective SMC (Figure 3.20).

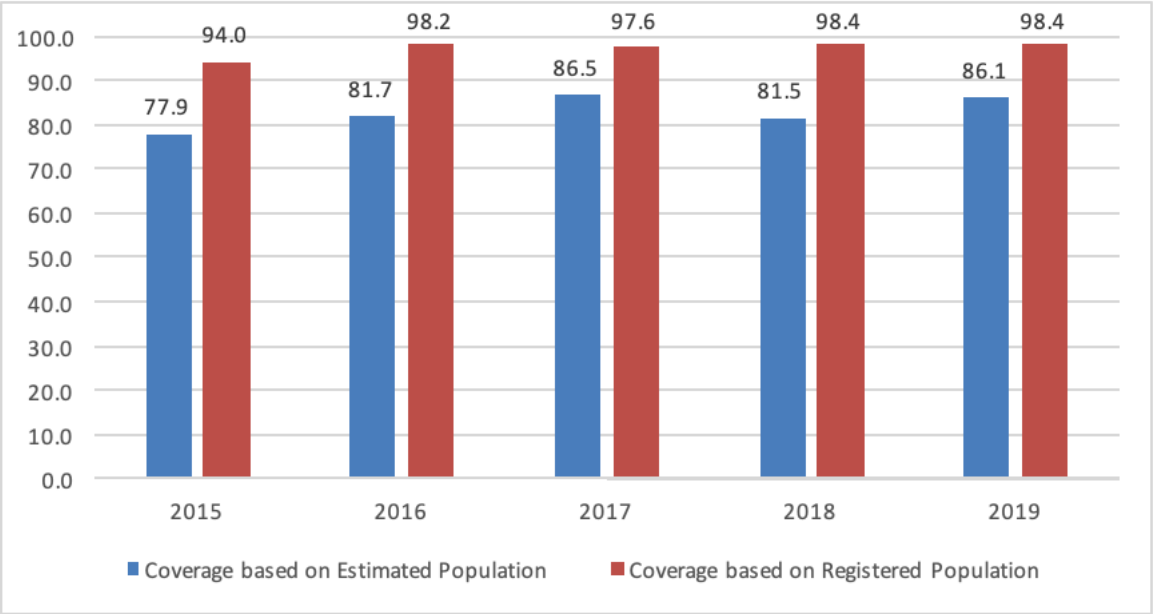


Figure 3.20: SMC coverage of Ghana 2015-2019

Challenges

- Long distances and hard-to-reach areas in most communities made supervision difficult and expensive.
- Some volunteers found it difficult to use the electronic data collection tool (SiCapp) and hence could not capture correct data.

Key Recommendations

- Ensure four rounds of SMC dosing is implemented on schedule in targeted districts.
- Require the NMCP to release all relevant logistics early to the regions.
- Conduct training and improve supervision on the use of the SiCapp tool.

Intermittent Preventive Treatment (IPTp) of MIP

Findings

- Gradual improvement in the coverage of all three dose of IPTp (IPTp 1, IPTp 2 and IPTp 3).
- Improvement in the availability of Sulfadoxine-Pyrimethamine (SP) for IPTp.

- Occasional shortages in supply of SPs in health facilities even though overall availability has been reasonably good.

Challenges

- Erratic supply of SP at the lower levels of the health system.
- Poor data management and non-reporting at the facility level into district health management information systems (DHIMS).
- Inadequate supply of registers and forms to capture SP provided.
- Maldistribution of skilled staff (e.g. midwives) at the lower levels for focused antenatal care (ANC).
- Weak defaulter tracing system (focused ANC).
- Weak pharmacovigilance for SP.

Key Recommendations

- Strengthen supply chain management especially at the lower levels to ensure availability of SP for pregnant women.
- Advocate for government procurement of most SP to limit the many delays in the procurement process.
- Do regular monitoring, supervision and provision of on-the-job training for facilities providing ANC services, and those providing supportive services in communities and doing advocacy for IPTp-SP at all levels.
- Train more NGOs to monitor pregnant women and support them to provide advocacy, communication and social mobilisation activities at the community level in collaboration with CHOs.
- Collaborate with the FDA to improve the system for reporting adverse drug reactions (ADRs) – especially as related to SP.

Objective 2: Provide appropriate diagnosis to all suspected malaria cases and prompt and effective treatment to 100% of confirmed malaria cases, in accordance to treatment guidelines, by 2020.

Overall, the proportion of suspected malaria cases tested increased steadily from 73% in 2014 to 91.5% in 2018 . This increase could have been due to improved awareness of testing before treatment, improved supply of testing consumables and trained personnel. There was a reduction in the use of ACTs, possibly due to an increase in the parasitological test of suspected malaria cases and adherence to the Test, Treat and Track policy.

Findings

- Confirmed malaria cases (microscopy and RDTs) per 1000 population rose from 132 in 2013 (HMIS) to 183 per 1000 in 2018.
- Malaria test positivity rate reduced from 50% in 2012 to 20.1% in 2018.

- Deaths attributed to malaria decreased from 9.0 per 100,000 in 2013 to 1.4 per 100,000 in 2018.
- The case fatality rate decreased from approximately 0.51 in 2014 to 0.09 in 2018.

Challenges

- Non-compliance with the guidelines for managing negative malaria test results.
- Though awareness is high, many fevers still are treated as malaria, even with a negative malaria test.
- Some health personnel nationwide are reluctant to embrace new information regarding malaria, especially with regards to the test-and-treat policy.
- The current data capture system is unable to provide information on the proportion of severe malaria cases treated with injection artemisinin and with quinine.
- Health centres and CHPS visited do not have access to ambulances to the nearest hospital.

Key Recommendations

- Intensify SBCC activities on adherence to test results.
- Continue building the capacity of health care providers at all levels of care.
- Conduct post-training supervision to ensure adherence to malaria treatment guidelines.
- Distribute revised treatment/MIP/diagnostics guidelines to health care providers at all levels.
- Have the NMSP 2021-2025 implement measures to capture data on severe malaria cases treated with injection artesunate or quinine.

Objective 3: Strengthen and maintain the capacity for programme management, partnership and coordination to achieve malaria programmatic objectives at all levels of the health care system by 2020.

Findings

- The "Strategic Plan for Malaria Control in Ghana 2014-2020" guided malaria control and there was an up-to-date M&E plan and implementation guidelines at the national level.
- RDTs kits were readily available at the central level and health workers have accepted RDT use. The kits were available and free at all facilities including the CHPS level.
- ACTs were also available, but not free for the small proportion of non-insured patients.
- The supply of ACTs and RDTs has been adequate in health facilities visited.

Challenges

- ADR forms were available in all facilities visited. All staff interviewed were aware of the form but no ADRs were reported in the year prior to the assessment.
- Guidelines for malaria management (case management, MIP, anti-malaria drugs policy) were not available at the District Health Directorate.
- Inaccurate quantification estimates for requisition from the facility level to the next higher level, inaccurate addition of recommended numbers of buffer.

- Different brands of RDTs with different timing for reading RDT results risked the accuracy of test results because endline workers do not always read the instructions for each RTD kit.
- Stock-outs of ACTs and RDTs occurred occasionally especially after the introduction of the Last Mile Distribution system. This is because managers had to familiarise themselves with the system and this resulted initially in delayed requisitions and stock-outs.
- Weak public P&SC system. This challenge is currently being addressed through introduction of new systems (e-solutions) – e.g. GhiLIMS for health commodities, and Ghana Integrated Financial Management Information System for financial management. These interventions when fully functional should bring some trust in public procurement.
- Storage conditions at CHPS and health facilities visited were poor.
- Supply of anti-malarial drugs (including SP and ACTs) was erratic and inadequate at times.

Key Recommendations

- Make available all essential guidelines for malaria management at all service delivery points.
- Improve implementation of Last Mile Distribution to strengthen the distribution system.
- Require the NMCP to work closely with the FDA to strengthen post-market surveillance of anti-malarials.
- Advocate for expansion of warehousing facilities for commodities.
- Enhance data capture by supporting full roll-out of the GhiLMIS.

Objective 4: Strengthen the systems for surveillance and Monitoring and Evaluation (SM&E) in order to ensure timely availability of quality, consistent and relevant malaria data at all levels by 2020.

Findings

- *Malaria surveys and evaluation systems exist.* Several surveys conducted in Ghana provide information on malaria; they include the DHS.

Challenges

- There is poor documentation of patient information in the electronic records system, particularly with laboratory results and prescribed medicine.
- Service delivery points do not routinely monitor indicators to inform decisions and action.
- ADRs are not reported; malaria is not included in the Emergency Preparedness and Response plan.
- Reporting and data capturing tools are unavailable.
- There are inconsistencies in data collection and management.

Key Recommendations

- Improve availability of reporting and data-capture tools for consistent data collection and management.
- Include meteorological data routinely in data repository to guide implementation.

Objective 5: Increase awareness and knowledge of the entire population on malaria prevention and control to improve uptake and correct use of all interventions by 2020.

Findings

Observations from MIS 2019 indicated:

- 59% of women have seen or heard a general malaria message. Most sources included television (77%), radio (56%) and a health worker (40%).
- 72% of women heard or saw an advertisement on **"Sleep under an insecticide treated mosquito net"**.
- 25% of women heard or saw an advertisement on "test first before taking malaria medicines".
- 84% of women age 15-49 mentioned mosquito bites as the cause of malaria and 79% identified the use of a mosquito net as a malaria prevention method.
- 55% mentioned fever as a symptom of malaria, and health-seeking behaviour for malaria-related morbidity.
- 34% of women experienced malaria in the 12 months before the survey, out of which 85% sought advice or treatment.

Challenges

- Insufficient social and behavioural change (SBC) approaches.
- High knowledge but low ideation/practice (e.g. low LLINs use).
- Limited involvement of DHMTs in NGOs in SBC trainings.

Key Recommendations

- Procure SBC materials in a timely way for sufficient awareness creation on interventions at all levels.
- Involve DHMTs in NGOs trainings.
- Provide more community-based interpersonal communication; build community ownership/responsibility.
- Support new Health Promotion Division to institutionalise its new capacity-building initiatives for training Health Promotion Officers to facilitate the translation of knowledge into practice by the target population.

3.3.3 Finance and resource mobilisation of the NMSP 2014-2020

The average share of the national budget going to health from 2014 to 2020 was 8.22%. During the same period, there was first an increase in the percentage of the health budget allocated to the NMCP, then, from 2016 to 2018, a steady decline. The average rate of budget reduction from 2016 to 2018 was about 14.1% (Figure 3.21). Since 2018, there has been a moderate increase in the amount i.e. NMCP's absolute budgetary allocation from 2018 to 2019 (Figure 3.21). Declining resource support for the NMCP could inhibit achievement of targets in the NMSP 2021-2025 and that budgetary allocation for malaria should in fact be released for programme implementation.

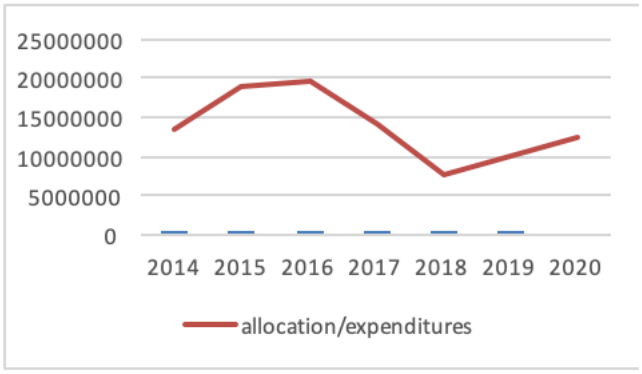


Figure 3.21: Budgetary allocation to the NMCP (USD)
Source: National Health Insurance Authority

Challenges

- The GMF and domestic resource mobilisation efforts have not be effective and so the NMSP's objectives are not being achieved.
- It is difficult to obtain information on Ministries, Departments and Agencies' funding for malaria.
- National Health Accounts (NHA) reports aggregate the data on malaria (including from NHIS) making it difficult to disaggregate further.
- Inadequate funding for NMCP activities and an over-reliance on donor resources.

Key Recommendations

- The GMF should adopt innovative strategies to achieve objectives and renew its efforts at resource mobilisation from both domestic and international sources.
- The MoH should advocate for more accountability of Ministries, Departments and Agencies on funding for malaria from the Ministry of Local Government.
- NHA reports should disaggregate spending on malaria for effective planning.
- NMCP should be allocated adequate resources as budgeted to undertake all planned activities.
- NMCP should be made less reliant on donor resources for operations.

4. STRATEGIC FRAMEWORK OF THE NMSP 2021-2025

4.1 Overview

The first NMSP (1993-1997) was developed to give strategic direction to malaria control in Ghana. Since the plan was developed, new and effective interventions such as parasitic diagnosis and treatment of uncomplicated malaria with ACTs, prevention of MIP through use of SP and IRS in hyper-endemic countries have emerged. Moreover, the Abuja Declaration of May 2006 came into being aimed at achieving and sustaining universal access to appropriate interventions for all populations at risk. These called for a revision of the existing strategic plan (2008-2015) to reflect the new developments and to provide strategies for achieving the Millennium Development Goals and other international targets in line with positioning malaria in the global development agenda, for 2015 and beyond.

The soon-to-end NMSP was for a period of seven years (2014-2020). It focused on consolidating gains in malaria control and accelerating interventions in high transmission areas. In addition, it was to reduce the malaria burden, and move towards having more low transmission areas in Ghana by the end of 2020. The new NMSP 2021-2025 aims at reducing further the malaria burden, achieving low transmission in most areas and initiating pre-elimination activities in selected areas of the country. Its objectives are in line with the National Health Policy, the MoH Health Sector Medium Term Development Plan, the Global Technical Strategy (GTS) and the Sustainable Development Goals.

4.2. NMCP vision

Malaria Free Ghana to contribute to the improvement of economic and social development.

4.3. Programme mission

To ensure that the entire population of Ghana has a universal and equitable access to interventions for malaria prevention and treatment and to achieve pre-elimination in selected areas.

4.4. Programme guiding principles

The NMCP's guiding principles are the shared rules and ethical standards that underpin its work as an organisation and its relationships with users and other stakeholders.

4.4.1. Country ownership and leadership

In Ghana, the MoH and GHS lead malaria control and pre-elimination. The NMSP is aligned with the Health Sector Medium Term Development Plan as well as national and global goals.

4.4.2. Inclusive and coordinated partnership

Implementation of all malaria control and pre-elimination-related activities will be led by the GHS NMCP and supported by numerous stakeholders and partners at all levels of the health system (national, regional, district, sub-district and community level). In addition, the inclusion of all key partners (in both public and private sectors) in the development of the NMSP 2021-2025 is aimed at harmonising actions by all partners in support of one NMSP. This is to ensure that efforts – and the utilisation of corresponding resources – are as efficient and effective as possible, to maximise impact.

4.4.3. Accountability

With the advent of performance-based funding mechanisms, the NMSP will be used as a tool to hold the NMCP, MoH, partners and stakeholders accountable to their commitments and responsibilities and to their beneficiaries. In this NMSP, the mechanism for holding all stakeholders accountable is being clearly described.

4.4.4. Evidence-based and results-oriented management

The MPR, conducted according to the WHO Practical Manual for MPR, provided the baseline for the strategic plan. The plan must achieve the most effective and efficient use of resources as well as ensure rapid action and a strong feedback loop.

All this will guarantee achievement of results-based management and the NMSP quality requirement, as follows:

- Strategies and activities are evidence based, relevant to the country and in line with WHO recommendations.
- Strategies are relevant, and providers and users comply with national polices and guidelines.
- The health system is able to deliver services.
- Available resources are maximised for provision of health services to reduce morbidity and mortality and drive towards achievement of UHC.

4.4.5. Socio-economic inclusiveness and equity

The malaria situational analysis and stratification identified important vulnerable subpopulation groups and communities most likely to be affected by malaria, to ensure they are appropriately targeted with malaria services. Equity between rural and urban areas is of critical importance for universal coverage. NMSP 2021-2025 planning, resource allocation and implementation include innovative mechanisms to reach the poor, highly vulnerable, hard-to-reach and displaced populations. Access to life-saving interventions, especially for the most vulnerable groups, is to be considered a "human right", and as much as possible improve access to services for all groups.

4.5. Strategic directions and policy priorities for an appropriate NMSP

The Government of Ghana has always expressed a willingness to make the fight against malaria one of the key health priorities for national development. Malaria control is integrated at all levels and sectors of the health system. It relies on the health sector policy based on the participation and empowerment of the community according to the National Health Policy. Given the changing malaria epidemiological profile in Ghana, specific interventions will be tailored to specific transmission settings based on epidemiological stratification. Efforts will be made to ensure universal access to interventions. Stratification of the malaria burden has been conducted for better targeting of these interventions. The high malaria burden areas (148 out of 260 districts) will be purposefully targeted for IRS or PBO/G2 nets and SMC if applicable. Activities in selected districts with a test positivity rate of less than 10% in 2018 will be consolidated as a foundation for moving towards malaria pre-elimination during the span of the NMSP 2021-2025.

In line with national global targets and based on the conclusions and recommendations of the 2019 MPR, the 2021-2025 NMSP has been designed to incorporate emerging ideas, policies, strategies and issues in malaria control and elimination, as appropriate.

Identification of strategic directions and priorities will be guided by the following:

- The WHO High Burden High Impact Pillars which aims to reaffirm commitment and refocus activities initially in high burden countries. The HBHI pillars which guides the NMSP 2021-2025 include:

I. Political will to reduce malaria deaths;
II. Strategic information to drive impact;
III. Better guidance, policies and strategies and;
IV. A coordinated national malaria response;

- National Medium-Term Development Framework (Agenda for Jobs: Creating Prosperity and Equal Opportunity for All), 2018-2021;
- National Health Policy and international commitments such as the GTS and the Sustainable Development Goals and targets;
- Level of progress towards the national and international targets for malaria;
- Strategic issues identified by the MPR 2019 that must be addressed in order to achieve national and international goals;
- Cost effectiveness and potential for impact; and
- Consideration of local contextual factors for implementation.

4.6. Goal and Objectives of the NMSP

4.6.1. Goal

Goal	Measurement
Reduce malaria mortality by 90% by 2025 (using 2019 as baseline)	*All malaria deaths reported through routine HMIS*
Reduce malaria case incidence by 50% by 2025 (using as 2019 baseline)	*Confirmed malaria case per 1000 population*
Achieve malaria pre-elimination in at least 6 districts by 2025	*Annual parasite index (number of positive slides per 1000 population at risk) and Slide Positivity Rate (SPR) from routine HMIS*

4.6.2. *Objectives of the NMSP 2021-2025*

The objectives of the NMSP 2021-2025 include:

1. Protect at least 80% of the population at risk with effective malaria prevention interventions by 2025.
2. Provide appropriate diagnosis to all suspected malaria cases and prompt and effective treatment to all confirmed cases in accordance with treatment guidelines by 2025.
3. Ensure at least 95% of the population will use at least one malaria preventive measure, and 95% of those with fever seek care within 24 hours of onset of symptoms by 2025.
4. Strengthen and maintain capacity for governance and programme management to achieve programmatic objectives at all levels of the health care system towards malaria control and pre-elimination by 2025.
5. Ensure timely and adequate supply of quality-assured malaria commodities to all service delivery points by 2025.
6. Improve mobilisation of resources and maximise the efficient use of available resources for greater public health impact by 2025.
7. Strengthen malaria surveillance and M&E system towards the 2025 malaria control targets.

4.7. Proposed Strategies

Objective 1: Protect at least 80% of the population at risk with effective malaria prevention interventions by 2025

Strategies:

- Distribute LLINs through mass campaigns.
- Distribute LLINs through ANC and Child Welfare Clinics and schools.
- Apply IRS in areas with high parasite prevalence.
- Do larval source management in targeted areas.
- Consider adopting emerging alternative methods of protection from the vector.
- Administer SMC.
- Continue using interventions that prevent MIP.

Objective 2: Provide appropriate diagnosis to all suspected malaria cases and prompt and effective treatment to 100% of confirmed malaria cases in accordance to treatment guidelines by 2025

Strategies:

- Provide quality malaria diagnosis at all levels of care (including quasi-governmental facilities).
- Strengthen capacity of health care workers for malaria case management at health facilities.
- Strengthen capacity building for malaria case management at health training institutions (pre-service).
- Build capacity and improve access to diagnosis and treatment in the private sector (clinics, pharmacies and laboratories).
- Strengthen referral systems and quality management for severe malaria case management at all levels.
- Increase communities' access to health care through CHPS by strengthening collaboration with other divisions.
- Improve availability of guidelines, protocols, job aids.
- Enforce adherence to guidelines at all levels.

Objective 3: Ensure at least 95% of the population will use at least one malaria preventive measure, and 95% of those with fever seek care within 24 hours of onset of symptoms, by 2025

Strategies:

- Advocate with stakeholders for commitment to ensure malaria interventions are prioritised and supported.
- Strengthen capacity of health workers at all levels in both public and private institutions to effectively engage communities.

- Increase awareness and knowledge of the entire population on malaria prevention and control interventions through:
    - Use mass media to engage the public on malaria control Interventions
    - Use social media to engage youths on malaria behaviour change activities
    - Strengthen CHPS staff outreach capacity for community engagement for malaria control and social mobilisation
    - Use campaigns on malaria interventions to trigger actions in times of special malaria interventions, low coverage, vaccination and replacement of ITNs
- Do risk communication and emergency preparedness.
- Strengthen coordination and implementation mechanisms for SBC activities.
- Work actively with the GHS Health Promotion Division.
- Do community engagement and interpersonal communication.
- Strengthen M&E of SBC interventions.

Objective 4: Strengthen and maintain capacity for governance and programme management to achieve programmatic objectives at all levels of the health care system towards malaria control and pre-elimination by 2025

Strategies:

- Enhance political will for malaria control and pre-elimination.
- Strengthen coordination and partnerships including private health providers.
- Orient to and train on pre-elimination activities.
- Supervise malaria programme implementation at all levels.
- Build capacity of national-level staff on current and emerging Information technologies.
- Upgrade IT infrastructure of the NMCP to allow a more coordinated approach to service delivery through automation.
- Ensure technologies procured are secure and reliable and minimise risk.

Objective 5: Ensure timely and adequate supply of quality-assured malaria commodities to all service delivery points by 2025

Strategies:

- Advocate for accurate, data-driven forecasting and supply planning of malaria commodities.
- Advocate for effective procurement and timely delivery of malaria commodities.
- Advocate for efficient warehousing and sustainable distribution system across the supply chain.
- Strengthen quality assurance systems for malaria commodities.
- Support full implementation of GhiLMIS for the provision of accurate and timely supply chain information for decision making at all levels (may not be possible at all health facilities).
- Strengthen capacity of health care workers involved in commodity management at sub

national levels.
- Establish guidelines and policies to guide implementation for the supply of RDTs and SPs to private sector.

Objective 6: Improve mobilisation of resources and maximise the efficient use of available resources for greater public health impact by 2025

The NMCP's financing objective is to increase mobilisation of resources and allocate them in a transparent and equitable way that maximises their efficient use for greater public health impact by 2025. To help achieve this, it plans to involve the private health sector. The NMCP framework therefore seeks to capture, analyse and streamline all sources of funds and the use of those funds.

In support of the NMSP 2021-2025, the NMCP prioritised its development of a financing strategy to achieve the above objectives: to collect, analyse and disseminate information about its sources of funding and how it uses the funding. In an environment of increasingly limited financial resources, the NMCP financing strategy supports a funding allocation process that is evidence-based, transparent, efficient and effective.

Strategies:
The financing strategy outlines current funding resources, allocation, management and risk mitigation related to the financial resources that support malaria programming.
Based on the NMCP's financing objectives and challenges to malaria financing in Ghana, the following policy statements form the foundation of the NMCP's strategic framework for malaria financing:

1. Allocate existing resources and ensure their efficient use at the service delivery level.
2. Advocate for stronger government investment through revenue collection.
3. Mobilise and allocate resources to under-funded priorities in malaria programming.
4. Implement de-concentration and decentralisation, using sound planning and financial management tools, regional block grants and internal contracting.
5. Strengthen harmonisation and alignment for results and donor funding.

Objective 7: Strengthen malaria surveillance and M&E system towards the 2025 malaria control targets

This aims to strengthen malaria surveillance through DHIMS2 to ensure timely availability of high-quality, consistent and relevant malaria data at all levels: public, private and quasi-governmental health facilities and 50% of pharmacies and over-the-counter medicine sellers (OTCMS) in order to track the progress of the malaria control and prevention interventions towards the 2025 malaria control targets.

The strategies for improving malaria surveillance and the monitoring and evaluation (SM&E) system are for the NMCP to strengthen technical capacity for that surveillance, for doing

malaria control and for creating and maintaining the surveillance logistics structure at all levels. The NMCP will carry out activities to improve the malaria control quality assurance system at all levels and will actively conduct malaria surveillance. Enhanced coordinated monitoring of programme progress towards malaria elimination, establishing an M&E system for pharmacies and OTCMS and strengthening surveillance at sentinel sites will be undertaken.
Specific strategies (reactive case detection, community sweeps, case-based reporting/ investigation) will be directed towards areas targeted for pre-elimination (Annual Parasite Incidence [API] and Slide Positivity Rate [SPR] <5%), through improved outbreak detection and response mechanisms.

Identification of Ghana Health Service personnel as private sector focal persons, supervision and M&E activities will be initiated as part of the private sector engagement. The NMCP will build their capacity to use the appropriate recording and reporting tool developed for the private sector to ensure accurate reporting through the community health information system into DHIMS2.

Strategies:

- Strengthen technical capacity for surveillance of malaria control at all levels.
- Strengthen the logistics structure for surveillance at all levels.
- Improve malaria control quality assurance system at all levels.
- Establish malaria surveillance and monitoring and evaluation system for pharmacies and OTCMS.
- Strengthen surveillance at sentinel sites.
- Disseminate surveillance reports.
- Enhance coordinated monitoring of programme progress towards malaria elimination.
- Improve data analysis and use at all levels.

For areas targeted for pre-elimination (API and SPR <5%)

- Confirm every suspected malaria case and adhere to all treatment protocols.
- Improve districts' diagnostic capacity for differentials for fever.
- Weekly case-based malaria data reporting through Integrated Disease Surveillance and Response (IDSR).
- Establish thresholds to identify outbreaks.
- Intensify the culture of data use for appropriate response and surveillance activities in the targeted areas.
- Employ the use of reactive case detection and treatment.
- Do peer review in districts targeted for pre-elimination.
- Migrate reporting system to case-based reporting at all service delivery sites.

4.8. Description of required strategies by objective

Vector control

Strategy 1: Insecticide- treated nets

WHO recommends use of ITNs as a core intervention for malaria vector control. All populations at risk of malaria in most epidemiological and ecological settings require deployment of ITNs that are prequalified by WHO.

Changes in malaria prevalence largely followed patterns of increasing ITN coverage, and ITNs are by far the most important intervention across Africa, accounting for an average 68% (62-72%) of the decline in the Plasmodium falciparum parasite rate seen by 2015 .

Mass ITN distribution campaign

Since 2010, Ghana has implemented mass ITN distribution campaigns as a main strategy in achieving universal ITN coverage (a net for every two persons in a household). Building on the achievement of high ITN ownership (73.7% in 2019 MIS), ITNs will be distributed to households through mass campaigns in all non-IRS districts/communities every three years. Mass campaigns have been implemented in 2010-2012, 2014-2016 and 2018, and a campaign is planned for 2021. All nets distributed will have met WHO prequalification standards. The country's stratification will be used to guide which type of net is distributed in which district. Nets with a PBO synergist and other new net types will be distributed in districts/communities with a high malaria burden and documented high resistance to pyrethroid insecticides.

Due to high pyrethroid insecticide resistance, the NMCP would like to shift immediately from using pyrethroid-only nets. If mandated to use them, it will distribute these standard ITNs to districts/communities with moderate to low transmission and low pyrethroid resistance. Urban area ITN distribution will be targeted at communities/populations at high risk. Quantification of ITNs will be based on the projected population and the universal coverage policy.

Continuous distribution of ITNs

As a keep-up strategy aimed at achieving high and sustained ITN use and care, the nets will be distributed routinely through health facility channels (ANC and Child Welfare Clinics) targeting pregnant women seeking ANC for the first time and children 18-36 months receiving a second dose of measles/rubella vaccine. Additionally, there will be annual distributions (except in years when mass campaigns are implemented) through primary schools for two targeted classes.

Private sector-led distribution of ITNs

Private sector players (ITN importers and distributors) will play a role in ensuring ITNs are available for sale to persons not reached by any of the public channels of distribution, especially urban dwellers. Strong advocacy with corporate organisations will be done to ensure employees and adopted communities have access to the nets to complement national efforts.

Strategy 2: Indoor residual spraying

As a core interventions recommended by WHO for malaria prevention, IRS will be used as an intervention/strategy targeting high burden areas identified by the recent national malaria stratification exercise. Frequency of spraying will depend on the malaria transmission profile and residual life of the WHO-approved insecticides used. Recent introduction of third generation insecticides has created opportunities for insecticide rotation to mitigate further development of insecticide resistance.

As part of the IRS intervention, entomological and insecticide resistance monitoring will guide decisions on the types of insecticide to apply and selection of appropriate target areas for IRS. Environmental compliance will continue to be an integral part of IRS to ensure the health and safety of implementers and beneficiaries

and protect the environment from contamination. Implementers will procure insecticides, personal protective equipment, and other IRS supplies and materials from approved suppliers.
To ensure successful implementation of IRS, the Malaria Vector Control Coordinating Committee (MaVCOC) will continue to provide guidance and oversight to IRS activities including insecticide resistance management. Annual reporting on IRS activities and coverage indicators will continue to be promoted as part of the committee's monitoring of IRS implementation.

Strategy 3: Larval source management

In 2018, Ghana re-adopted larval source management as a strategy to augment core interventions in targeted areas with bio-larvicides. Experience from the earlier implementation has guided the development of a revised implementation plan for the intervention. The plan is to use larval source management in targeted areas: urban/ peri- urban areas, and some rural areas where breeding sites are few, fixed and findable.

The number of unbiased studies on the efficacy or effectiveness of larval source management in Africa, including Ghana, is limited . Therefore, it will be conducted in Ghana in combination with other interventions. First, it will be done within the broader context of generating or reviewing local data on larviciding. Areas targeted for larviciding will be mapped and implementation evidence documented to inform expansion phase.

Activities proposed under environmental management (manipulation and modification) will be conducted in the context of Integrated Vector Management and will be in line with environmental sanitation policy , which addresses some of the major components of environmental management and housing. Through collaboration with other Ministries, Departments and Agencies, building regulations and environmental management by-laws (especially regarding illegal surface mining) will be ensured and enforced.

All larval control activities will be under the direction of the NMCP. Effective partner collaboration, through the Malaria Vector Control Coordinating Committee, will ensure appropriate capacity building, technological transfer and an objective assessment of the impact of these interventions.

Strategy 4: Entomological surveillance

Entomological surveillance is a backbone of all vector control activities because it provides comprehensive scientific information to guide design and implementation of various malaria control strategies on the ground. The National Insecticide Resistance Monitoring Partnership (NIRMOP), which comprises the NMCP and Noguchi Memorial Institute for Medical Research (NMIMR), is integral to entomological surveillance in the country. Its main purpose is to collect data on insecticide resistance of Anopheles mosquitoes. It will lead collection of data in 30 sentinel sites, in at least one site per region in all 16 regions of the country.

Monitoring of insecticide resistance began in 2014 after the training of GHS staff – including disease control officers, lab technicians and regional biologists – in the various sentinel sites. The trained personnel have worked with technical experts from NMIMR to collate data on resistance across the 20 original sentinel sites. NMIMR and partners also carry out regularly molecular testing of mosquitoes to understand the resistance mechanisms involved. Over the years, Ghana adopted new methods (such as CDC bottle assays) and tested new insecticides, as soon as they are granted WHO's pre-qualification certification.

The data have shown that Anopheles mosquitoes throughout the country are highly resistant to pyrethroid insecticides and susceptible to organophosphate insecticides. However, there is observed enhanced susceptibility to pyrethroids when mosquitoes are pre-exposed to a synergist (PBO). As previously stated, the data will be used in informing policy on procurement of ITNs with PBO and the choice of the insecticides for IRS in specific locations.

Also as stated, broad entomological surveillance will be undertaken in 30 sentinel sites to measure key

entomological indicators (species composition, abundance, seasonality of malaria vectors, vector behaviour, distribution etc.) that will support the implementation and M&E of vector control interventions in the country

Strategy 5: Novel vector control interventions

Residual transmission and insecticide resistance are becoming a challenge to the indoor-based malaria vector control interventions because of the insecticides they use. A number of innovative tools and approaches are under development to overcome these challenges, and they soon could be available for use in specific target areas or wider depending on their efficacy and operational feasibility. These include dual active ingredient insecticide combinations for bed nets, repellents, genetically modified mosquitoes, sterile insect technique, use of eave tubes, and attractive toxic sugar baits. The new NMSP will promote the use of the innovations provided they are WHO and Ghana FDA approved and available for implementation. These interventions and tools are expected to expand the options for malaria prevention by augmenting the existing core vector control interventions such as IRS and LLIN.

Studies have shown that there is a strong association between malaria incidence and the type of housing, independent of the house's location and residents' behaviour. In collaboration with all relevant stakeholders, improved house construction that includes screening or other modifications against mosquito entry will be promoted in communities where it is applicable.

Strategies for Malaria in Pregnancy

Pregnancy and malaria are mutually aggravating situations. The physiological transformations during pregnancy and pathological transformations because of malaria combine to put the mother and unborn child at risk. Prevention of malaria infection is one of the effective approaches for addressing the burden of MIP. In accordance with WHO, malaria prevention in pregnancy in Ghana will continue to be delivered as a package of interventions including early and timely ANC attendance, the use of LLINs, and IPTp using SP. This will be in accordance with policy guidelines and in collaboration with the Reproductive and the Child Health Department of the Family Health Division (FHD), and all facilities providing ANC services including public, CHAG and private facilities.

The main objective is to protect at least 80% of eligible pregnant women by having SP available at all service delivery points for directly observed therapy (DOT) at every ANC visit

Strategy 1: Improve SP availability at all service delivery points for DOT at every ANC visit

One of the major strategies to ensure an increase in IPTp coverage of eligible pregnant women is availability of quality SP at all service delivery points for DOT at every ANC visit. To ensure a continuous supply of SP, staff will be trained on logistics management including quantification based on consumption data and improved stock management. This training will be carried out for all facilities providing ANC services in the country. SP will be procured for distribution to all facilities through the Last Mile Distribution. Quarterly review meetings to review SP requisitions from RMS to the central level and supplies of SP from the central level to RMS will be held to validate the requisitions and supplies of SP. Supportive supervision will monitor SP availability and address supply challenges.

The NMCP will collaborate with Stores, Supplies and Drug Management (SSDM) of the Ghana Health Service, Procurement and Supply (P&S) and development partners to improve quantification of SP at all levels and ensure all facilities providing ANC services have SP-IPTp.

Strategy 2: Improve implementation of prescribed IPTp in all teaching hospitals, quasi-governmental hospitals, and CHAG and private hospitals

Stronger collaboration will be built with all teaching hospitals, quasi-governmental hospitals, and CHAG and private hospitals. This will ensure that all pregnant women regardless of where they access ANC services are

provided with the complete package of interventions including IPTp. Engagement with the heads of these facilities will be paramount in ensuring the facilities implement IPTp. The NMCP will strengthen capacity for all relevant staff in IPTp implementation, to ensure the availability of free SP and to ensure availability of the appropriate data-capturing tools at all times.

Efforts will be made with the support of the regulatory and professional bodies to organise trainings for staff in these facilities award Continuous Professional Development points for MIP trainings and for all skill improvement activities in malaria control. Staff will be engaged to ensure all pregnant women visiting for their ANC will be given SP as DOT before they leave the midwife's station, and GHS standard data-capturing tools will be printed and distributed. Quarterly meetings to review SP requisitions from these facilities and monitoring and supportive supervision will be intensified to ensure facilities are implementing IPTp as prescribed.

Strategy 3: Ensure that staff involved have the latest technical guidance and updated MIP protocols

Staff with up-to-date technical guidance and protocols for MIP – and other skills – will be achieved through training, dissemination of scientific content, access to a web-based platform, and so forth. With the revision in 2019 of the MIP guidelines as well as other guidelines and policies, it is imperative that all relevant staff are provided with the updates. Training on the MIP protocols will target both pre-service students in their final year and in-service staff. There will be intensified advocacy to make MIP trainings part of the requirement for graduation in the nursing and midwifery institutions. Training manuals and curriculum will be developed and trainers arranged. This will be a continuous activity and implemented in all health training institutions across the country.

Efforts will also be made with the support of the regulatory bodies and professional bodies to award Continuous Professional Development points for MIP training to encourage staff to attend MIP trainings as part of the in-service strategy.

Strategy 4: Review and update appropriate protocols

Guidelines – protocols, job aids, monitoring charts and IPTp tally books – will be reviewed, updated, produced and distributed to all facilities and other institutions via print, videos, social media, radio and TV and in collaboration with NGOs across the country. The NMCP may develop an app or online portal for easy access to the materials that can be accessed through multiple channels such as online portal and app.

Strategy 5: Advocate for enhanced reporting on side effects of SP-IPTp for improvement in SP uptake

Advocacy for the Strengthening Pharmaceutical Systems Programme in collaboration with the Ghana FDA and the NMCP assessed the Ghana pharmacovigilance system using the indicator-based pharmacovigilance assessment tool. Basic structures for conducting pharmacovigilance activities are in place in Ghana. However, a need exists to strengthen pharmacovigilance systems that should include more than adverse events data collection, but also evaluation, minimisation, and communication of risks. IPTp-SP Pharmacovigilance hacks activities relating to the detection, assessment, understanding and prevention of adverse effects as well as documentation and reporting. Part of the IPTp-SP intervention is building the capacity of health staff on the prevention, detection and reporting of ADRs. This will be targeted at all pregnant women eligible for IPTp-SP at all maternal health service delivery points throughout the country.

Strategies for Seasonal Malaria Chemoprevention

SMC is currently implemented in five regions with four rounds of dosing annually. Analysis of routine HMIS data shows that morbidity cases amongst the target age group peak from June through October (five months). To reduce morbidity within the period of greatest malaria risk, five rounds of dosing will be piloted within a cycle. This will also increase the probability that children of the target age group will receive at least three dosing

of the recommended anti-malarial within the transmission season. Findings from the Parasite Prevalence of Sentinel Sites show an increase in malaria morbidity amongst children 5-10 years compared with children under 5. The target age group for SMC therefore will be increased to cover children 5-10 years.

Based on findings from epidemiological stratification, SMC will be extended to Oti region, meaning the intervention will be implemented in six regions: Upper West, Upper East, North East, Northern, Savanna and Oti. The main activities will be macro-planning, micro-planning, quantifying and procuring of anti-malarial medicines, SBCC, training of volunteers and health workers, dosing of children with SMC medicines, data validation exercises, pharmacovigilance, and post-SMC review and evaluation. The SMC delivery approach will be a combination of door-to-door and mobile fixed point to dose hard-to-reach populations. Monitoring of ADRs will be strengthened during implementation and managed appropriately.

Objective 2: Provide appropriate diagnosis to all suspected malaria cases and prompt and effective treatment to 100% of confirmed malaria cases in accordance to treatment guidelines by 2025

Strategy 1: Provide quality malaria diagnosis at all levels of care (including quasi-government facilities)

Quality malaria diagnostic tests will be procured and supplied to facilities to ensure quality diagnosis. Routine laboratory confirmation will be performed by microscopy (where available) and RDTs. Efforts will be made to build capacity of public and private sector laboratory personnel in blood film preparation and staining, microscopic examination of blood film for parasite detection, species identification and parasite density determination as well as screening for Glucose-6-Phosphate Dehydrogenase (G6PD) deficiency. Strategies include structured trainings and skills maintenance through pre- and in-service training, strengthening quality control/assurance, updating the malaria slide bank and providing laboratory guidelines.

To ensure a continuous supply of diagnostics, improved supportive monitoring/supervision and stock management will be pursued. Quantification, based on consumption data, will be the norm. In collaboration with donors and the Clinical Lab unit, the outreach training supportive supervision (OTSS) and proficiency testing scheme (PTS) being implemented for laboratories in Ghana will be continued with the addition of cross-checking. Other diagnostics will also be explored for use in different settings in Ghana like taking dried blood spots during household surveys and conducting molecular testing.

Strategy 2a: Strengthen capacity building for malaria case management at health facilities
Strategy 2b. Improve management of severe malaria at all levels of care

All relevant staff will be trained on the update of the guidelines for the management of uncomplicated and complicated malaria. The training will be conducted after the development of protocols, guidelines and job aids.

Regarding severe malaria, monitoring and observation charts will be developed for the management of severe malaria. In addition, basic equipment for emergency care of severe malaria will be provided for 80% of facilities with the highest need. Targeted supportive supervision by OTSS and integrated supportive supervision will be conducted for all facilities. Underpinning these actions will be quality improvement capacity building to address quality challenges across the levels of care. Specific reference will be made to the National Health Quality Strategy developed by the MoH.

The MoH launched the National Healthcare Quality Strategy as part of Ghana's effort to attain quality UHC by 2030. This aims to coordinate the health system and health care quality at all levels of the health system, in both the public and private sectors, and all areas of health – with a particular focus on the seven priority areas including malaria. The GHS subsequently developed guidelines for the implementation of the strategy at all

levels, with support from USAID Systems for Health.

Previous national malaria control strategies have focused on quality planning, quality control and quality assurance interventions with less focus on quality improvement interventions. Quality improvement interventions, however, empower frontline health care providers and health managers to use scientific improvement tools to identify gaps in the case management of severe malaria, diagnose the gaps and solve problems posed by the gaps through repeated testing and standardisation of innovations that reduce mortality from severe malaria. The use of quality improvement methods has been proven effective in reducing malaria mortality during Project 5's Alive project and also in reducing maternal and child health mortality through the WHO's on-going Quality of Care Network for Maternal and Child Health Project in 11 countries, including all 16 regions of Ghana.

These strategies are targeted at children and pregnant women and will be implemented in regional and district hospitals across Ghana using predetermined criteria which include the highest burden of morbidity and mortality from severe malaria at all times of the year for the five years of the NMSP implementation.

Strategy 3: Build capacity and improve access to diagnosis and treatment in the private sector

Previous attempts at persuading the private health sector to contribute to achieving agreed national targets for malaria control activities have had mixed results, with successes and failures on different fronts. To achieve consistent success requires a new and holistic approach to private sector engagement. A system is needed to engage private sector suppliers and link them to private sector retailers, making sure these are streamlined so that they bring in the correct RDTs for ease of use by health workers.

Guided by the lessons of public-private partnerships, the Health Facilities Regulatory Authority could lead engagement of the three aspects of health care delivery in the private sector – diagnostics, clinical care and pharmacies – to create a platform for effective collaboration with the NMCP. This presents a private sector-led approach rather than the usual public sector-led one. The integrator will lead collaboration between the NMCP and Association of Private Medical Laboratories, Ghana (APMLG); Society of Private Medical and Dental Practitioners (SPMDP); and Community Pharmacy Practitioners Association (CPPA).

Implementation will be guided by standard policies and guidelines to promote quality-assured practices and standard recording and reporting using agreed tools appropriate for each service provider.

Objective 3: Ensure at least 95% of the population will use at least one malaria preventive measure, and 95% of those with fever will seek care within 24 hours after the onset of symptoms by 2025

Low risk perception and poor treatment-seeking behaviour limit the uptake and impact of important prevention and treatment interventions. Understanding and addressing the barriers to behaviour change is a key strategy in the national effort to increase the uptake of the diagnostic, treatment and prevention services that are being carried out countrywide.

Key behavioural risk factors that threaten the effort to interrupt onward transmission of malaria exist, including delay in treatment seeking due to long distances to access health care, inappropriate use of the LLIN (e.g. for fishing due to poverty and unavailability of fishing nets, fencing of gardens, creating barriers against flooding), as well as sporadic and selective house spraying.

Although malaria is a priority public health problem in Ghana, high-level advocacy has not been adequate to influence national and regional leadership to sustain and scale up malaria interventions towards pre-elimination. Advocacy needs to be sufficiently appreciated as an element of the pre-elimination strategy that will mobilise domestic (public and private) support, which is critical to the sustainability of malaria control and elimination.

Based on the behaviour change challenges identified in the MPR 2019, a multi-pronged and integrated approach is required to address the identified challenges as well as contribute to achievement of the objectives of the NMCP's NMSP 2020-2025.

Multi-pronged approach strategies have been considered to yield results in changing positive behaviour in malaria at various levels including success stories from the international community will be adapted. The strategies that will be used include the following.

Strategy 1: Advocate for stakeholder commitment to ensure malaria interventions are prioritised and supported

The success of malaria control interventions depends greatly on government and partner political will, commitment, and policy decisions to provide adequate funding for delivering services like preventive measures and quality-assured diagnoses and treatment; strengthening management in areas like surveillance and logistics and supply systems; and integrating malaria programmes into primary health care and other health system platforms. The advocacy will focus on mobilising support from individuals: traditional, religious and opinion leaders including queen mothers, chiefs and policy makers such as regional house of chiefs, aimed at increasing their commitment of at all levels (national, regional, district and community) to allocate resources to malaria services.

On a more organizational level, advocacy will be done with members of district assemblies and other political bodies, corporate bodies, the media, civil society organisations (CSOs), community-based groups (community-based, non-governmental, and faith-based organisations) and other opinion leaders. Moreover, lobby groups will be established to target the presidency, members of parliament, local government and the private sector to increase domestic funding. Amongst the core activities to be carried out include preparing and providing regular updates, feedback and progress reports to partners on national scale-up campaigns and stories of interest on malaria. Increased national political and continued engagement of Global Fund and donor government to fight malaria is critical.

Advocacy should emphasise the benefits of existing SBCC campaigns such as "Zero Malaria Starts with Me" and the political opportunities of UHC to identify and overcome the socio-political barriers impeding access to preventive and treatment services for malaria. Advocates will explain how malaria control interventions must take into account health care utilisation patterns of people. Government will be encouraged to spearhead strategic market development for ITN usage based on analysis of the total market which includes social marketing, NGOs activities and private sector involvement.

Strategy 2: Use mass media to engage the public on malaria control interventions

Strategic mass media activities will provide information on and engage the public in malaria interventions. There will be national coverage of targeted messages that provide information to families for appropriate care seeking for malaria, ITN use, and acceptance of IRS, larviciding and potential use of the malaria vaccine to move the country towards pre-elimination. Electronic media – TV, radio, videos – and more traditional media such as outdoor billboards and newspapers will be used to communicate with different audiences. The national dailies and other print media will be used to publish news about the activities of the NMCP and to elicit government commitment to malaria prevention and management interventions.

A well-crafted campaign will broadcast radio and TV spots on local and national stations. They will air jingles,

live presenters' mentions, documentaries, human interest stories and other material on malaria. Scheduled live discussions will also be held on radio and TV to address misconceptions, myths and misuse of ITNs and to solicit the public's views through live phone calls.
Mobile vans and community information centres will be used to broadcast pre-recorded malaria related-messages to the general public.

Strategy 3: Strengthen community action for social mobilisation

Engaging the community fosters a sense of ownership and commitment to accept and sustain malaria interventions. One strategy aimed at achieving this is the GHS' CHPS concept. The CHPS strategy plans to bring health services to people's doorstep and encourage their uptake of all malaria control interventions. Communities also will brainstorm, plan and implement their own activities based on their own challenges to acceptance and uptake of the interventions.

The core activities are constituting a community health management committees, developing community action plans on malaria, validating the action plans in the community, building community consensus on the plans, and carrying out community-led implementation and monitoring of the action plans. Communities through their health management committees and other structures will lead continuous M&E of activities in their plans. Strong linkages with health management committee delivery structures and NGOs for IPTp, ITN, IRS, larviciding, SMC and case management will be encouraged. The NMCP will actively engage and work with the GHS Health Promotion Division to strengthen community action for social mobilisation.

Local leaders, citizens, and community-based, non-governmental, and faith-based organisations will be mobilised to increase awareness to correct misconceptions about malaria. Mass media will be used to reach the masses with messages on malaria, targeting specific audiences. Print materials such as brochures, posters and leaflets will relay malaria messages. Community health management committee members and CHOs will carry out door-to-door visitation to urge people to adopt and accept key malaria interventions. Households will be made to sign pledge cards and badges will be issued for pasting on their doors to signify their commitment to champion the initiatives.

The activities will include other social groups in the community-driven activities such as school children, mother-to-mother support groups and other groups that are identified. At school, sensitisation will be carried out through school health clubs at the primary, and junior and senior high schools and tertiary levels.
In addition, theatre performances, folk songs, sports events, role play, skits, drama, poetry, dance performances and traditional channels such as the community information centre, churches, mosques, roof-top and mobile van announcements and other creative channels will be used.

Strategy 4: Use social media to engage youths in malaria behaviour change activities

Social media is a powerful new tool for disseminating information and engaging the public. The health sector has acknowledged the undeniable impact social media can have on the quality of service delivery.
The NMCP will leverage social media platforms (Facebook, WhatsApp, Twitter and Instagram) to disseminate information dissemination to the general public but especially to youths. Social media will be monitored to gather and respond to rumours and myths in relation to malaria prevention and case management interventions.

Strategy 5: Develop educational materials on malaria for social and behaviour change

SBC materials will be developed to facilitate and complement communication with general and specific audiences. A technical working group will develop content for creative briefs and other materials – posters, counselling cards, leaflets, TV spots and docudrama, short video clips and others – based on reports from the field. Existing materials will be put to effective use as well.

The GHS SBC technical review committee will review the new SBC materials developed before the materials are pre-tested amongst segmented audiences. Once finalized, they will be disseminated in all major local languages

to improve uptake. These materials will be kept by the Health Promotion Division's communication repository for easy access by all malaria intervention partners.

Strategy 6: Strengthen capacity of health workers and stakeholders in both public and private institutions to effectively engage communities at all levels.

Health workers: Health workers are an important source of information for the general public regarding the control of malaria. Their training and experience ensures that people are getting accurate information in a way that encourages their needed behaviour change and dispels their distrust of RDTs and other interventions. Health workers in both private and public facilities will be trained to give appropriate counsel on adherence to drug regimens for malaria treatment and IPTp uptake.

The interpersonal communication capacity of health workers and OTCMS in both private and public institutions will be improved. This will give them the skills to effectively communicate accurate information regarding treatment regimen, the use of ITN, IPTp, SMC, IRS, larval source management and malaria vaccine and other guidelines on malaria. Guidance on counselling and interpersonal dialogue for health workers on malaria control also will be addressed so that the workers will relate well to their clients and make the clients feel comfortable and willing to access care at any time without fear. The positive attitude of health workers towards people who seek health care goes a long way in improving those people's health condition.

Media: News editors, journalists, managers, presenters and bloggers from radio and TV stations and newspapers will be trained on malaria interventions. They will be provided with the needed tools and kits to enhance accuracy in reporting on malaria activities, and promotion of malaria prevention and treatment. They also will be trained to do awareness creation on ITN, IPTp, SMC, management and treatment of malaria, larviciding and World Malaria Day commemoration.

Civil society, community-based, non-governmental, and faith-based organisations: The capacity of these organisations will be strengthened through training on social mobilisation, community engagement and participatory learning activities so that they have the skills and knowledge to lead community engagement activities. They will also be provided with the needed logistics and funding to carry out the activities.
Information Services Department (ISD) and National Commission for Civic Education (NCCE): Officers of these organisations will be trained on interpersonal communication and community engagement and provided with information to engage communities on malaria prevention interventions. They will be involved in using mobile vans to broadcast announcements and doing night screenings on malaria prevention interventions in communities. They will also support educational sessions in churches and mosques.

Strategy 7: Provide risk communication and emergency preparedness

During malaria emergencies, malaria prevention and control communication interventions will increase. This will include the promotion of ITN use, early diagnosis and treatment, addressing MIP, IRS, malaria vaccine, larval source management and response to malaria prevention and treatment in the case of travel outside Ghana. There will be an expansion of communication channels and scale-up of community-based interventions, greater collaboration with other agencies such as the Ministry of Tourism, Ghana Aviation Authority, Ghana Hoteliers Association, Ghana Immigration Services, Ghana Revenue Authority (Customs Division), Ports and Harbour Authority and so forth, to equip individuals and households with information and skills to manage malaria.

Strategy 8: Implementation and coordination mechanism for SBC activities

SBC activities will be coordinated by the NMCP in collaboration with the GHS Health Promotion Division. The NMCP in consultation with major stakeholders in the technical area of SBCC and community engagement will update National Malaria Communications Plan 2014-2020 to cover the period 2021-2025; the new plan will detail the strategies mentioned and guide all malaria programmes and interventions in the country. The

activities outlined in the plan will be implemented at various levels of existing leadership and management structures. At the sub-national level, Health Promotion Officers will implement the activities in collaboration with other health workers and other stakeholders.

Objective 4: Strengthen and maintain governance and programme management to achieve programmatic objectives at all levels of the health care system towards malaria control and pre-elimination by 2025

The strategies being adopted for the NMSP 2021-2025 are intended to enhance political will for malaria control and pre-elimination in selected areas of the country. They also aim to strengthen coordination and partnerships, increase the capacity of all NMCP management staff and service providers for malaria control and pre-elimination through improved supervision of malaria programme implementation at all levels and support the integrated supportive supervision of the GHS.

Using the private sector integrator, the MoH Private Sector Desk and the Policy Planning Monitoring and Evaluation (PPME) Division will work on maintaining private sector engagement and keeping malaria a priority within the Ministry.

Improved use of technology to monitor and improve programme performance will be actively pursued by building staff capacity on current and emerging information technologies, upgrading the IT infrastructure of the NMCP to allow a more coordinated approach to service delivery through automation and ensuring that technologies procured are secure, reliable and pose minimal risk.

Objective 5: Ensure timely and adequate supply of quality-assured malaria commodities to all service delivery points by 2025

Strategy 1: Ensure accurate, data-driven and timely forecasting and supply planning of malaria commodities

The NMCP will collaborate with the P&SC system/SSDM and the National Quantification Team to develop an annual schedule for national quantification and work according to that schedule to do quantification reviews and supply plan updates. The quantification team will collate and analyse supply/consumption and other service data from the GhiLMIS and DHIMS, respectively, and this will provide inputs for conducting more accurate consumption- and service-based forecasts.

Forecasting will be conducted annually and reviewed semi-annually in accordance with the schedule; supply planning will be done monthly. To achieve the supply targets, the NMCP will do quarterly monitoring and update supply plans to inform procurement decisions.

To further strengthen the quantitation process, the NMCP through the quantification team will advocate for the acquisition of forecasting and supply planning tools. Additionally, periodic refresher training in forecasting and supply planning will be organised for supply chain practitioners involved in quantification.

Strategy 2: Advocate for effective procurement and timely delivery of malaria commodities

The Government of Ghana through the Public Procurement Authority (PPA) has developed the Ghana Electronic Procurement System (GHANEPS) to make public procurement more transparent and efficient. The NMCP in collaboration with SSDM will ensure the system is used to procure malaria commodities (SP, RDTs, LLINs and ACTs). This will improve procurement lead times. However, there are funding gaps in malaria procurement. To address the gaps, the NMCP through the MoH and GHS will advocate for funding from the government and development partners so it can procure all needed commodities.

The NMCP will also collaborate with PMI to support and fund devolution of procurement to the regional

level via the work of the Global Health Supply Chain-Procurement and Supply Management Project . The NMCP will, in addition, collaborate with the P&SC system/ SSDM of the Ghana Health Service to sustain pooled procurement (Framework Contracting) of selected malaria commodities in order to purchase quality commodities at standardised and affordable prices across the country.

Supply of commodities (typically RDTs and SPs) to the private sector has been inconsistent due in part to the absence of a clear policy to guide the supply chain. To address this, the NMCP will collaborate with the MoH to engage the relevant private sector organisations to develop a policy and roadmap to supply programme commodities to the private sector in a manner that ensures quality, equity, efficiency, transparency and accountability. The NMCP will work to ensure that proactive governance structures are in place, in line and in compliance with the country's supply chain master plan.

Strategy 3: Advocate for efficient warehousing and a sustainable distribution system throughout the supply chain

To address warehousing challenges for malaria commodities (particularly LLINs) at both the central and regional medical stores, the NMCP will collaborate with P&SC, SSDM, regional health directorates (RHDs) and partners to advocate for optimisation of warehousing and operations across the supply chain.

The NMCP in collaboration with SSDM and RHDs, will work to integrate all malaria commodities (LLINs and SPs) and other non-medical commodities (e.g. information, education and communication [IEC] materials) into the Last Mile Distribution programme (from central to regional medical stores and teaching hospitals and from RMS to service delivery points) to guarantee continuous delivery and availability of commodities at the service delivery points. The NMCP will advocate for the allocation of more resources to RMS to sustain Last Mile Distribution.

Strategy 4: Strengthen quality assurance systems for malaria commodities

To guarantee the availability of quality malaria commodities, the NMCP will collaborate with the FDA and partners to conduct continuous quality monitoring of malaria commodities at ports of entry and post markets. To strengthen quality assurance processes across the supply chain, the NMCP in collaboration with the FDA will conduct semi-annual audits of quality-assurance processes to ensure they remain current and relevant.
Strategy 5: Support full implementation of GhiLMIS for the provision of accurate and timely supply chain information for decision making at all levels.

The NMCP will support implementation of GhiLMIS through the P&SC/ SSDM. To obtain supply chain data, it will extract an inventory report from the system each month for analysis to inform decision making.
To guarantee adequate capacity and continuous use of the GhiLMIS system, the NMCP in collaboration with SSDM and the GhiLMIS team will conduct regular refresher training for identified end-users who require training.

Strategy 6: Strengthen the capacity of health care workers involved in commodity management at sub-national levels

The capacity of commodity managers at lower-level service delivery points is inadequate and contributes to poor inventory management of malaria commodities at those levels. This is partly due to lack of appropriate training of staff and high turnover of supply chain staff. To address this, the programme will collaborate with SSDM and partners to conduct supply chain supportive supervision and refresher trainings as a means of retaining high levels of capacity for commodity managers at service delivery points.

Objective 6: Improve mobilisation of resources and maximise the efficient use of available resources for greater public health impact by 2025

Description of required strategies

The NMSP is a comprehensive multi-year plan (2021-2025) that addresses all aspects of the malaria program – prevention, control and case management – and is based on national strategic priorities. For the period of the plan, the NMCP financing strategy in Ghana will be based on a model of combined funding from the government, public-private partnerships and development partners. It will rely on integration and co-implementation and will plan for the sustainability of financing into the future. Financing Instruments and Interventions

Financing mechanisms in place or to be designed to support malaria implementation are classified as:

1. Government malaria expenditures
2. Public-private partnerships
3. External funding

6.1 Government Malaria Expenditure- Malaria financing landscape and partnership

Strategy 1: Increase government spending and improve efficiency of government resources allocated to malaria programming.

This strategy will focus on increasing the share of government expenditures for malaria as a share of total government health expenditure, which will require a gradual shift from donor funding towards more sustainable domestic funding of the national health budget. Effective yearly and medium-term planning tools exist in the health sector: The Strategic Framework recommends their efficient implementation at the sub-sector and decentralised level and their use in strategic budgeting at all levels. Also, improved financial management tools will help strengthen the efficient use and monitoring of government expenditures if implemented by all levels of the Budget and Management Centres (BMCs).

i. Allocation of national resources for malaria

Desired Outcomes	Interventions
• Increased malaria budget as a proportion of GDP and MoH/GHS allocation • Decreased dependence on external aid for recurrent costs • Efficient allocation of resources allocated efficiently cross categories (e.g. labour and operations) to maximise health outcomes	• Build the business case with the MoFEP to advocate for increasing the share of government expenditures on malaria. • Use five-year Strategic Plan and Programmes of Work in strategic and yearly budget formulation. • Identify resources for five-year NMSP and annual work plans and perform financing gap analysis using available tools. • Routinely monitor allocation of funding to malaria.

ii. Credible government budget for malaria

Desired Outcomes	Interventions
• Full commitment to the approved national malaria budget • Full commitment to the approved BMC budget	• Strengthen NMCP capacity for strategic budgeting and public financial management reform. • Use five-year Strategic Plan and Programmes of Work for budget negotiations and implementation.

iii. Efficient implementation of government resources

Desired Outcomes	Interventions
• Efficient (i.e. timely and evidence-based) disbursement of approved budgets, particularly BMC budget for malaria activities.	• Implement decentralisation, with relevant capacity building in public financial management at all levels of the i.e. BMCs. • Public financial management reform implementation, especially programme-based budgeting, with relevant NMCP output indicators.

iv. Coherent infrastructure development

Desired Outcomes	Interventions
• Balanced allocations for capital costs with coherent funding for maintenance and recurrent expenditures • Comprehensive budget formulation	• Design a coherent Public Investment Plan for health including recurrent costs for facility maintenance and training needs. • Integrate the investment plan for health into annual work plans and five-year NMSP. • Include capital funding, and recurrent costs for maintenance in the NMCP budget.

6.2 External funding to support NMCP/NMSP 2021-2025

Strategy 2: Align development partner funding with GHS/NMCP strategies, plans and priorities and strengthen coordination of development partner funding for malaria.

Currently, nearly all operational funds for malaria come from donors. Donor funding is largely provided on an ad hoc basis. Each tranche of funding requires a separate proposal, budget and report. This limits efficiencies, weakens planning and does not support a sustainable, long-term approach.

There is a need to strengthen the alignment of donor funding with NMCP priorities for 2021-2025. The same yearly and medium-term planning and budgeting tools as well as financial management tools should be used to plan and monitor donor funding. This harmonisation and alignment should be applied to NGOs working in the malaria programme area, although the important role of civil society in supporting the prevention and control of malaria and engaging in policy dialogue should be recognised and supported.

i. Alignment of external assistance with NMCP priorities

Desired Outcomes	Interventions
• Donor support aligned with priority issues defined in the NMSP 2021-2025 • Predictable donor support in the medium term	• Identify areas of duplication and gaps through five-year Strategic Plan and Programmes of Work gap analysis at all levels. • Strengthen medium- and long-term projection of donor resources for malaria.

ii. Harmonisation of donor funding

Desired Outcomes	Interventions
• Donor funds coordinated through the MoH/GHS process	• Review existing donor arrangements for decision making. • Agree on expansion of successful financing initiatives to national scale.

6.3 Public-Private-Partnership – Resource Mobilisation

Strategy 3: Enhance planning for results, resource mobilisation and financial sustainability of malaria programmes.

Sustained and consistent funding is necessary for successful prevention and control of malaria in the country. There is a need to leverage other government agencies' and corporate bodies' interest in preventing and controlling malaria. Private sector investment can help ensure that resource gaps identified in the MNSP/ Funding Gap Analysis are addressed to cover the following priorities:

- Strengthen malaria SM&E system to ensure timely availability of high-quality, consistent and relevant malaria data at all levels in order to track the progress of the malaria control and prevention interventions towards the 2025 malaria control targets.
- Strengthen and maintain capacity for governance and programme management to achieve programmatic objectives at all levels of the health care system towards malaria control and pre-elimination by 2025.
- Increase awareness and knowledge of the entire population on malaria prevention and control to improve uptake and correct use of all interventions by 2025.
- Ensure a timely and adequate supply of quality-assured malaria commodities to all service delivery points as well as material and financial resources, by 2025.
- Provide appropriate diagnosis to all suspected malaria cases and prompt and effective treatment to all confirmed malaria cases in accordance with treatment guidelines by 2025.
- Protect at least 80% of the population at risk with effective malaria prevention interventions by 2025.

6.4 Co-financing

In 2010, the World Bank's country income classification defined Ghana as a lower middle-income country. As such, it is obligated to pay more in donor co-financing payments, which the MoH projected to rise from US$167M in 2019 to US$190M in 2025 for malaria alone. In line with the income classification, some donors have begun decreasing funding and programmatic support for malaria and other health areas. For example, Global Fund funding for malaria decreased by 32% between the preceding and the current (2018-2020) funding cycle, and the U.K. Department for International Development eliminated its programmatic funding

for malaria in 2019.
Based on the need to increase domestic resources, a key recommendation in "A Roadmap for Sustainability and Transition from External Finance", based on an Oxford Policy Management and MoH assessment of health sector financing in Ghana, has been for the government to prioritise co-financing payments within the health budget, adding that malaria could be fully funded if these were paid. Also, a strategy has been developed for exploring options for domestic mobilisation of funding to address the financing need. Domestic funding for the previous NMSP 2014-2020, was estimated at 41%.

i. Capacity building in proposal writing and fund-raising techniques

Desired Outcomes	Interventions
• NMCP staff trained on fundraising techniques	• Develop a fundraising/proposal writing curriculum training manual • Train GHS/NMCP staff on resource mobilisation techniques.

ii. Private/Public sector assistance for the NMCP

Interventions: Intensify resource mobilisation efforts and increase funding from 41% to 85% funding for malaria control and pre-elimination activities from government, the private sector and partners by 2025.

Strategy 4: Advocate for an increased government financial allocation to malaria control and pre- elimination

a) Develop issue briefs and an investment case on malaria financing issues and co-financing needs, and disseminate to members of Parliament who sit on the Select Committee on Health and to the MoFEP.
b) Conduct semi-annual briefing sessions with the Parliamentary Select Committee on Health and Malaria Caucus on progress, challenges and proposed interventions including policy and tax measures to ensure sustained financing.

Strategy 5: Strengthen accountability measures related to the 0.5% District Assembly Common Fund funding for malaria to ensure appropriate allocation of malaria funding at the district level.

a) Engage appropriate government bodies (Ministry of Local Government and Rural Development) and CSOs to review all policy documents related to the 0.5%, including review of budget line items and expenditures to assess applicability of funds for malaria projects.
b) Assign participation in Metropolitan Municipal and District Assembly meetings to civil society and decentralised DHMTs, to share progress, challenges and recommendation on malaria control activities particularly regarding use of funds from the District Assembly Common Fund.
c) Engage Parliamentary Select Committee on Health to advocate for accountability mechanism to ensure effective use of allocated resources.
d) Develop and organise a briefing package for a briefing meeting with the Select Committee on Health and Malaria Caucus, with appropriate follow-up; this will include advocacy to increase the District Assembly Common Fund allocation.
e) Engage CSOs to lead a nationwide district-level monitoring of malaria funding to assess the amount of domestic funds for malaria reaching the community level, enabling evidence building for high-level advocacy.

Strategy 6: Assess and adopt innovative financing mechanisms [non-traditional] to address decreasing donor funding

a) Assess potential innovative financing mechanisms that are applicable for health more broadly with impacts on malaria specifically.

b) Develop a roadmap for adopting these selections (e.g. remittances, percentages of existing taxes, new taxes).
c) With the GHS, conduct briefings with high-level leaders, including the Select Committee on Health, for adoption of these innovative financing mechanisms for malaria.

Strategy 7. Accelerate implementation of the GMF to contribute to malaria control and pre-elimination activities with contribution from the private sector.

Securing private sector contributions is key to meeting NMSP targets. This strategy aims to increase the private sector contribution to malaria control to at least 20% of the NMSP budget. One way to do this is to revitalise the Ghana Malaria Foundation with a Technical Oversight Committee chaired by the NMCP. The committee will vet how contributions are used to fill critical NMSP needs for maximum impact. Tying those contributions to specific geographic or administrative areas that can be clearly assigned to specific private sector donors as "their responsibility to cover" can ensure that private sector partners receive recognition for their efforts whilst also having a meaningful impact. This approach could be reasonably easy if, for example, private sector stakeholders were to provide malaria commodities, such as LLINs or SMC, for distribution through an established channel such as a mass distribution campaign or health facility or contribute a portion of their budget through the GMF, to specific interventions in the NMSP.

Strategic priorities will focus on assessing, gaining and sharing evidence on private sector investments in malaria control and promoting investments that work:

- Review and disseminate a new GMF governance structure and terms of reference.
- Provide technical assistance to the GMF to develop a strategic plan that outlines private sector investment options for contributing to NMSP needs.
- Provide support to the GMF to strengthen dialogues between the GMF, the MoH and the MoFEP to assist companies to receive tax credits and/or waivers for their investment in malaria (e.g. provide technical assistance to the GMF to develop a structure via agreement with the MoFEP/Ghana Revenue Authority) that allows investors easy access to tax incentives.
- Engage political leadership to explore opportunities for tax incentives for private sector investment to fill NMSP needs, with linkages to the Ghana 'Beyond Aid' agenda.
- Identify geographic or administrative areas that can be clearly assigned to specific private sector companies as "their responsibility to cover".
- Develop and disseminate advocacy tools such as business and investment cases, brochures and PowerPoint presentations that promote the benefits of investing in the NMSP via the GMF.
- Develop malaria prevention frameworks for different industries to scale up small projects under GHS authority (e.g. mandating through the Chamber of Mines to all mining companies and incentivising expansion).

Objective 7: Strengthen malaria surveillance and M&E system towards the 2025 malaria control targets

Strategy 1: Strengthen technical capacity for surveillance data, analysis and use for malaria control at all levels

Surveillance assesses the impact of all the interventions being implemented across all levels. Human resource capacity to do surveillance effectively is vital. The NMCP in collaboration with the PPME will put in place measures to strengthen the technical capacity of health workers as well as a logistics infrastructure for effective functioning of DHIMS2. In addition, the surveillance capacity of staff in confirmed pre-elimination areas will be strengthened.

To carry out this strategy, health workers will be trained in the use of data for decision making and for summarising the data in malaria bulletins.

The following activities will be carried out under this strategy:

- Training of regional-level staff / facilitators (training of trainer) on data management and use
- Training of district-level staff by regional facilitators/data managers on data management and use
- Training of facility-level staff by district facilitators/data managers on data management and use (public sector including teaching hospitals, quasi-governmental facilities and CHAG)
- Training of facility-level staff by district facilitators/data managers on data management and use (private sector)
- Supervision of trainings of facility data managers by national-level staff (public and private sectors)
- Training of new staff on DHIMS (including the Malaria Integrated Dashboard) and reporting tools
- Quarterly data review meetings
- Pre-service training on using DHIMS for management of malaria data collected from malaria registers, reporting forms and indicators
- Updating of staff on new SM&E via national and international courses
- Advocacy for recruitment of staff with data management competencies at all levels

Strategy 2: Strengthen the logistics structure for surveillance at all levels

An effective surveillance system needs a robust logistics structure comprising warehousing, transportation, material handling, packing, distribution, security and, most importantly, inventory control. The NMCP together with stakeholders will put in place measures to ensure that logistics management is strengthened at all levels through the following actions:

- Print and distribute data reporting forms.
- Upgrade the information and communication technology (ICT) infrastructure (server, applications and accessories).
- Procure computers, printers and accessories for data management at the national level.
- Procure computers, printers, tablets and accessories for data management at sub-national levels.
- Support maintenance of the ICT infrastructure at the NMCP.
- Procure external / flash drives, and corporate antivirus software.
- Establish a back-up system.

Strategy 3: Improve malaria quality assurance system at all levels

Malaria control interventions in most endemic countries have been intensified in recent years and there is a need for an adequate M&E system to measure progress and achievements made over time.

Governments and funding partners both request robust evidence of health returns on their investments. To generate such evidence, countries need to have a solid information system in place to monitor and measure malaria interventions and achievements. Currently, malaria data quality assurance is still a major challenge at sub-national levels. Some data managers are unable to provide quality data on time to inform decisions. The NMCP together with partners will strengthen capacity of staff and stakeholders to improve the malaria quality assurance system at all levels.

The following activities will be used to improve on the quality assurance system:

- Develop/Update standardised SM&E procedures, tools and guidelines.
- Print malaria data reporting tools and guidelines.
- Support updating and printing of guidelines for data use/sharing (Data Utilisation Manual).
- Update, print and distribute Standard Operating Procedures on Health Information Management.
- Conduct monthly (weekly for areas in pre-elimination) data verification meeting at all levels.
- Conduct periodic data analysis for use in decision making.
- Supervise periodic data analysis meetings by the next level.
- Roll out quarterly data quality audits at the district level.

Strategy 4: Establish malaria M&E system for pharmacies and OTCMS

M&E is an essential aspect of the NMCP and ensures that results (impact, outcome, outputs) at all levels provide the basis for accountability and decision making at the national and sub-national levels.

Much health service information regarding malaria control that should come from pharmacists and OTCMS is lost due to inaccurate data or non-reporting of data in DHIMS2. This is primarily due to their inadequate knowledge of M&E and non-reporting in the existing system in place to transmit it. The programme seeks to reinforce the information system these groups use. To enable them to produce timely, accurate, reliable and valid data for planning, management and decision making, it will train and equip them to do M&E.
The following activities will be piloted and expanded:

- Engage pharmacies and OTCMS institutions on the need for malaria data reporting and its impact on control activities in the country.
- Develop an appropriate data management system for pharmacies and OTCMs; including data collection tools.
- Train pharmacists and OTCM staff on data management.
- Conduct joint periodic review meetings to assess performance and provide update on control intervention

Strategy 5: Strengthen surveillance at sentinel sites

Sentinel sites are used to assess indicators relating to malaria parasitaemia, entomological issues and drug efficacies. Malaria sentinel site surveillance is vital in guiding programme planning, updating and notifying governments and donors on progress made towards malaria control. To improve on sentinel surveillance of collection and handling of data on malaria morbidity, drug efficacy and entomological monitoring, the NMCP intends to maintain the gains made at sentinel sites by using the underlisted activities:

A. Anti-malarial drug efficacy

- Conduct bi-annual data collection (10 health facilities).
- Do quarterly monitoring (10 health facilities).
- Hold bi-annual review meetings to get feedback from monitoring, discuss implementation challenges and share best practices and lesson learnt.
- Conduct orientation for new staff at all sites on procedures for monitoring anti-malarial drug efficacy.

B. Parasite prevalence monitoring

- Do quarterly monitoring (30 health facilities).
- Hold an annual review meeting for feedback from monitoring, discuss implementation challenges and share best practices and lesson learnt.
- Conduct orientation for new staff at all sites procedures on parasite prevalence study.

C. Entomological monitoring (Insecticide resistance monitoring Inoculation Rate Monitoring)

- Conduct annual insecticide resistance monitoring
- Conduct monthly vector bionomics monitoring/data collection (30 sites).
- Support vector control officers for the monthly vector bionomics monitoring
- Create community entomological monitoring framework.
- Hold an annual review meeting for feedback from monitoring, discuss implementation challenges and share best practices and lesson learnt.
- Conduct an orientation on entomological surveillance and insecticide resistance procedures for new staff at all sites.

Strategy 6: Analyse and disseminate surveillance reports

This strategy is used to inform all stakeholders on progress made and challenges encountered while working to control malaria in Ghana. It also is a tool to facilitate decision making, highlight achievements and create awareness for increased resource mobilisation and allocation of resources to maintain the gains made.
Activities for this strategy will include the following:

- Develop and produce bulletins.
- Produce and print half-year and annual reports.
- Document best practices.
- Upload copies of bulletin, and half-year and annual reports to GHS website.

Strategy 7: Enhance coordinated monitoring of programme progress towards malaria pre-elimination

Building on the unprecedented progress achieved over the previous decade, the NMCP has set national and sub-national targets to accelerate activities for eliminating malaria transmission and preventing its reestablishment. Coordinating activities from partners and getting adequate support from them is needed to maintain gains. A number of activities including the following will be carried out.

- National "ways toward pre-elimination" meeting
- Partners coordination meeting at district and regional level (quarterly)
- SM&E Technical Working Group meetings at national level (bi-annual)
- Development of an annual M&E work plan

4.9 Implementation Arrangements

4.9.1 Planning and implementation mechanisms

As set out in this new strategic plan, the NMCP will continue to do technical oversight of all malaria interventions at national and sub-national (regional and district) levels in both the private and public sectors. Designated malaria focal persons at the two levels will do the oversight in a coordinated way. The NMCP also will continue to ensure that all stakeholders and partners align with the NMSP when implementing their malaria control interventions; this includes using the mechanisms in place for review and assessment of their programme performance at the mid- and end-term. The NMCP will ensure that the findings and recommendations from these reviews will inform future implementation.

4.9.1.1 Human resources

Optimal programme implementation requires that the programme's human resource needs are fully met. The NMCP Programme Manager, assisted by the Deputy Programme Manager, will provide overall programme oversight.

The national team should comprise focal persons in entomology, epidemiology and other technical areas such as malaria case management, MIP, malaria diagnostics, P&SC management, SBCC, partnership coordination, private sector resource mobilisation and M&E. Programme technical staff will be supported by a team of administrative staff consisting of an administrator, administrative assistants, secretaries, finance officers and drivers.

At the regional and district levels, malaria control is integrated into the broad health service delivery system. There are regional and district malaria focal persons at the community level, and CHPS to provide basic health care including malaria case management. In communities where CHPS is not present, community-based volunteers are trained to take care of malaria.

4.9.1.2 Training and capacity development

The NMCP will use short courses, conferences, exchange programmes, coaching and mentoring to update the knowledge and skills mix of its national-level staff and create a critical mass of technical personnel. It also will support the malaria control teams in the regions, districts and sub-districts, as well as public and private care providers, to improve their skills and competencies. For the period 2021-2025, two staff will be hired for the vector control team to increase entomological capacity and the efficiency with which the vector control activities are managed. Additional personnel will be engaged to focus on and intensify resource mobilisation efforts. Regarding M&E, due to the proposed plan to expand validation of malaria admissions in the new implementation period, three additional data managers will be recruited to efficiently manage the proposed activities.

4.9.2 Partnership coordination system

4.9.2.1 Partnership within health sector

The NMCP plays the leading role in coordinating all malaria control implementation strategies by both the MoH and development partners. It partners with many divisions, units, partners and programmes within the health sector to solicit their input into malaria control.

In particular, it works closely with GHS divisions, departments and units to plan, implement and monitor programmes. These include the Health Promotion Division, Institutional Care Division, Family Health Division and Policy Planning, Monitoring and Evaluation Division.
Nine technical working groups/committees exist to support programming:

- Malaria Vector Control Oversight Committee (MAVCOC)
- Case Management
- Malaria in Pregnancy
- Research, Innovation and Surveillance, Monitoring and Evaluation
- Malaria Vaccine Technical Supply Chain Management Working Group
- Procurement and Technical Working Group
- Co-payment Task Force
- Malaria Vaccine Technical Advisory Group
- Resource Mobilisation Sub-committee

Each of these committees has clear terms of reference, and is supposed to meet regularly to ensure a harmonised output in the specific areas of operation. There is need for a Malaria SBC sub-committee which should be established during implementation of the NMSP 2021-2025. These groups will be resourced to meet periodically for effective implementation of the NMSP 2021-2025.

4.9.3 Availability and viability of partnership and donor coordination mechanisms

The NMCP will continue to engage partners such the PMI/USAID, UNICEF and WHO in planning, implementation, and monitoring of programme activities in the 2021–2025 period. These partners will be represented in the various working groups, annual performance reviews and key programme activities. The programme will continue to develop work plans, review implementation with partners to ensure effective use of resources and avoid duplication of activities and programmes. PMI has a number of implementing agencies with each of them focused on a key area of intervention addressed in the NMSP. UNICEF and WHO will also continue to provide technical assistance for the implementation of the strategic plan.
The NMCP will support these implementing agencies in carrying out activities in their project sites and, to build partnerships for malaria control, has trained personnel to do this. The programme will also hold a number of meetings with the Global Fund Country Team and the Country Coordinating Mechanism to review its programme of work.

4.9.4 Partnership with civil society, corporate bodies, private sector

Over the years the NMCP has collaborated with members of the Coalition of NGOs in Malaria and Health to implement community-level advocacy and sensitisation activities. It will continue to select NGOs for collaboration, based on their capacity in community mobilisation. The NMCP will support the GHS District Health Management Teams to implement community-driven interventions that will improve uptake of malaria interventions.

The NMCP also will collaborate with corporate entities and other private sector bodies through entities such as the Ghana Malaria Foundation to advocate for resources and deeper developmental partnerships to combat malaria in communities and at the national level.

4.9.5 Procurement of malaria commodities

Malaria Medicines is guided by the National Anti-malaria Drug Policy developed by the NMCP. Non-medical products are selected in accordance with WHO recommendations and specifications. Forecasting and supply

planning, and procurement of all selected malaria commodities, medical and non-medical, are based on National Quantification Guidelines and the Public Procurement Act 663 of 2003 as amended, respectively.
Warehousing is done across all levels of the supply chain. Whilst the Global Fund- and USAID/PMI-funded commodities are warehoused centrally by Imperial Health Sciences (IHS), all products funded by the Government of Ghana and other development partners are warehoused and distributed from the Temporary Central Medical Stores to the 10 RMS and Teaching Hospitals. The 10 RMS will continue to serve all six newly created regions, until the new regions form their own stores. RMS manage and distribute health products to all service delivery points.

This arrangement assures quality products are available in an appropriate quantity for service delivery at all levels. Distribution of health products throughout the supply chain is coordinated by P&SC system, SSDM, programmes, RHDs or partners through the Logistics Management Unit, P&SC Management Technical Working Group and the Regional Supply Chain Technical Working Group.
The FDA provides quality assurance for commodities across the value chain.

4.10 Financial Resource Management

4.10.1 Flow of funds and reports

In the MoH, the existing channels of funds flow depend on two circumstances:

1. The level at which the funds are received; and
2. Where implementation takes place.

Funds for implementation of activities of a national character are received at GHS headquarters from MoH. From there, the funds are sent to the level or health facilities where implementation will take place. For example, if implementation is to occur at the district BMC level, then the funds would move via a GHS or Global Fund transfer mechanism that sends them from headquarters to the Regional Health Directorates (RHDs) and then to the district health directorates. The district BMC, supervised by the RHD, is informed of this funds transfer. In the absence of an integrated enterprise accounting software, this is how the MoH and GHS ensure transparency, good supervision, and accountability for funds transfers.

After funds are used, programmatic and financial reports must be submitted through the RHD back to headquarters. Figure 4.1 depicts the flow of funds and reports in the MoH and GHS.

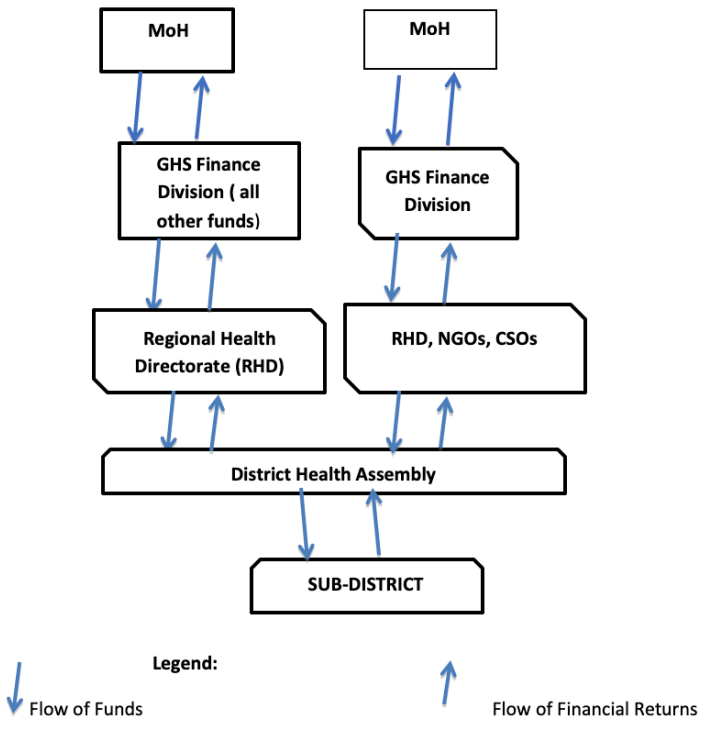


Figure 4.1. Flow of funds and reports

Figure 4.1. Flow of funds and reports

When the MoH fully implements the Ghana Integrated Financial Management Information Systems, the flow of funds within the Ministry will change: the funds will flow directly to the implementation level. Transparency and supervision will be maintained because the supervising BMC will have access to all the funds flowing to the BMCs under them, and will know how the funds are being utilised.

4.10.2 Risk management plans

Table 4.1: Critical programmatic risks identified

Risk Category (functional area)	Risk	Mitigating Actions
Insecticide resistance	Pyrethroid resistance is documented nationwide; resistance to organophosphates is being detected at an increasing number of sites. Worsening insecticide resistance may result in reversal of gains and an increase in morbidity and mortality.	Shift completely from pyrethroid-only nets during the period covered by this strategy. Finalise and implement an insecticide management plan which outlines rotation of insecticides, monitoring of insecticide resistance etc. Introduce third generation insecticides and PBO nets.
Programmatic	Inadequate communication between region/districts and facilities on the availability of commodities, which leads to maldistribution and results in shortages of quality-assured commodities in some places, and expiry in over-stocked areas.	Review the ''Last Mile Distribution'' strategy at sub-regional levels in collaboration with key partners and make recommendations for improvement.
PSM	Maldistribution leads to expiry of drugs and loss of malaria commodities.	Continue the use of the GhiLMIS already in place. Strengthen the GhiLMIS at all levels, (eLMIS solutions currently being rolled out).
	Competing demands slow absorption capacity and implementation of activities.	Develop and deploy a dashboard for monitoring implementation. Improve planning and programming of activities at the implementing level.

Programme and performance risk	Delays in implementation of activities might affect the achievement of performance targets.	Introduce enforcement mechanisms for timely disbursement of funds. Strengthen managerial capacities and oversight function to improve synergy in the implementation of programme activities at regional and district levels. Continue quarterly monitoring and feedback as well as stakeholder and dashboard review.
	There is inadequate partnership between CSOs and health managers at policy and local levels.	Strengthen CSOs participation in policy dialogue, planning, implementation and monitoring and evaluation at the national and decentralised levels.
	Despite advocacy, socio-cultural norms (traditional belief systems) in communities may result in low uptake of ITNs and other interventions and continuity of care.	Readjust sensitisation approaches and messages by community opinion leaders to suit the community members. Employ available and approved contingency measures.
	Public health and clinical emergencies at the global or national level may affect the national malaria control efforts.	Readjust and re-align programme delivery, and comply with national strategic directives during pandemics, epidemics or disasters in line with the Emergency Preparedness component of Ghana's UHC roadmap.
	New and emerging interventions at the global or national level may affect malaria control efforts.	Readjust and re-align programme delivery, and comply with national strategic directives and guidelines.

4.10.3 Financial Risk Mitigation

A system for managing NMCP financial risk should be developed at a scale that reflects the size and resource constraints of the NMCP. The management system should be able to regularly assess, prioritise, plan for and monitor risks and plan for their mitigation; examples of critical risks, with a mitigation strategy, are listed in Table 4.2. The risk mitigation plan should assign accountability and responsibility for monitoring risks to one or several "risk owners". Existing management structures such as regular meetings should be used to report against risks and solicit feedback on the risk management process.

Table 4.2: Critical financial risks identified

Risk Category	Risk	Mitigation Strategy
Financial Risk	Inadequate system of internal controls, especially at the regional/district levels, may result in financial mismanagement /inefficient use of funds.	Enforce Public Financial Management Act, 2016 (Act 921). To complement this, routine technical monitoring will include monitoring receipts and acquittals of funds at regional and district levels.
	Poor management oversight may result in inability to meet donor requirements and account for the use of funds.	Pursue high-level advocacy for timely release of government counterpart funds, through intensified engagement with key government agencies such as the MoH and MoFEP. Scale-up the Financial Resource Tracking Tool to cover all known sources of funds and review current financial accounting systems to capture and report on partner support.
	Failure to reimburse facilities for NHIS claims may result in non-adherence to case management protocols and increased case fatality.	The new government has started paying off NHIS arrears. As of May 2020, an amount equivalent to US$24,319,809 had been paid to facilities. Currently, an additional US$38M is being transmitted to facilities.
	Transparency in funding allocation processes is low.	Develop and institutionalise standardised mechanisms/format for requesting, receiving and tracking malaria funding.
	There is a lack of malaria financing data.	Develop and institutionalise a systematic methodology to track and analyse malaria resource allocation, spending and gaps.
	Vertical programming hinders integration into overall MoH/GHS planning processes.	Integrate NMCP budgeting and programming into overall long-term MoH/GHS planning processes including the next Health Sector Medium Term Development Plan and the associated Health Financing Strategy. Strengthen tools for integrated long-term planning and budgeting across programmes. Advocate for budget allocations to be in line with integrated planning. Monitor budget allocation against long-term plans and annual operational plans.

5. IMPLEMENTATION FRAMEWORK OF THE NMSP

5.1 Developing a Work Plan

Objective 1: Protect at least 80% of the population at risk with effective malaria prevention interventions by 2025

Table 5.1: Work plan: Vector control

Objective	Strategy	Main Activities	Timeline					Person/ Agency Responsible
			Year 1	Year 2	Year 3	Year 4	Year 5	
Objective 1: Protect at least 80% of the targeted populations at risk with an ITN (ownership and use)	Strategy 1. ITN distribution through mass campaign	Activity 1.1.1. Conduct stakeholder engagement/meetings						NMCP/GHS
		Activity 1.1.2. Conduct microplanning						NMCP/GHS
		Activity 1.1.3. Conduct trainings (Training of Trainers, Registration Assistant and Distribution Point Attendant training)						NMCP/GHS
		Activity 1.1.4. SBCC activities for household registration and distribution						NMCP/GHS
		Activity 1.1.5. Provide IT support for household registration and distribution						NMCP/GHS
		Activity 1.1.6. Register households						NMCP/GHS
		Activity 1.1.7. Validate household registration data						NMCP/GHS
		Activity 1.1.8. Move ITNs from central stores to district stores						NMCP/GHS
		Activity 1.1.9. Do point distribution of ITNs to households						NMCP/GHS

		Activity 1.1.10. Monitor and supervise household registration and ITN distribution exercise						NMCP/GHS
		Activity 1.1.11. Conduct post-campaign review meeting						NMCP/GHS
	Strategy 2. ITN distribution through health facility (ANC and Child Welfare Clinics)	Activity 1.2.1 Monitor and supervise ITN distribution in health facilities through OTSS						NMCP/GHS
		Activity 1.2.2. Conduct review meeting						NMCP/GHS
	Strategy 3: ITN distribution through schools	Activity 1.3.1. Train District Ghana Education Service and GHS staff						NMCP/GHS
		Activity 1.3.2. Move ITNs from central stores to district Ghana Education Service stores						NMCP/GHS
		Activity 1.3.3. Move ITNs to schools and distribute to pupils						NMCP/GHS
		Activity 1.3.4. Monitor and supervise distribution in schools						NMCP/GHS
		Activity 1.3.5. Conduct post-distribution review meeting						NMCP/GHS
	Strategy 4: Advocacy for private sector-led ITN distributions	Activity 1.4.1. Engage private institutions in distributing ITNs as part of their Corporate Social Responsibility programme						NMCP/GHS
		Activity 1.4.2. Educate public on alternative ITN products on the commercial market						NMCP/GHS
		Activity 1.4.3. Engage commercial parties to make customised ITN products available on the open market						NMCP/GHS
		Activity 1.5.1.Conduct training for field team						NMCP/GHS

	Strategy 5:Durability and bio-efficacy monitoring of ITN products	Activity 1.5.2.Conduct field work and data capture						NMCP/GHS
		Activity 1.5.3.Monitor and supervise fieldwork						NMCP/GHS
		Activity 1.5.4.Conduct dissemination meeting						NMCP/GHS
Objective 2: Protect at least 90% of targeted populations at risk through IRS with at least 90% coverage in all found structures	Strategy 1: Implementation of IRS of houses in eligible areas	Activity 2.1.1. Conduct microplanning meeting						NMCP/GHS
		Activity 2.1.2. Train district team, recruit spray personnel and community mobilisers						NMCP/GHS
		Activity 2.1.3. Move logistics						NMCP/GHS
		Activity 2.1.4. Conduct sensitisation activities in communities						NMCP/GHS
		Activity 2.1.5. Conduct IRS in communities						NMCP/GHS
		Activity 2.1.6. Monitor and supervise IRS implementation						NMCP/GHS
		Activity 2.1.7. Conduct post-spraying quality tests						NMCP/GHS
		Activity 2.1.8. Conduct post-spray campaign review meeting						NMCP/GHS
		Activity 2.2.1. Conduct pre-spray mosquito collection						NMCP/GHS

	Strategy 2: Entomological and insecticide resistance monitoring	Activity 2.2.2. Conduct insecticide resistance intensity tests and synergists assays						NMCP/GHS
		Activity 2.2.3. Conduct residual efficacy test of sprayed insecticide						NMCP/GHS
		Activity 2.2.4. Conduct post-spray mosquito collections to assess impact of IRS (pyrethrum spray catches, human landing catches, light traps)						NMCP/GHS
	Strategy 3: Environmental compliance	Activity 2.3.1. Conduct pre-season environmental compliance assessment						NMCP/GHS
		Activity 2.3.2. Conduct mid-spray environmental assessment						NMCP/GHS
		Activity 2.3.3. Conduct post-spray environmental assessment						NMCP/GHS
Objective 3: Reduce mosquito population densities in targeted areas with larval source management	Strategy 1: Mapping of all potential breeding sites	Activity 3.1.1. Engage stakeholders at regional/ district level						NMCP/GHS
		Activity 3.1.2. Train supervisors and spray operators						NMCP/GHS
		Activity 3.1.3. Conduct community sensitisation						NMCP/GHS
		Activity 3.1.4. Conduct mapping exercise in selected areas						NMCP/GHS
		Activity 3.1.5. Monitor and supervise mapping activities						NMCP/GHS

		Activity 3.1.6. Conduct review meetings						NMCP/GHS
	Strategy 2. Larviciding of all eligible breeding sites mapped	Activity 3.2.1. Orient spray operators for larviciding						NMCP/GHS
		Activity 3.2.2. Move larvicide and other logistics						NMCP/GHS
		Activity 3.2.3. Do weekly/monthly larvicide application						NMCP/GHS
		Activity 3.2.4. Monitor and supervise larviciding activities						NMCP/GHS
		Activity 3.2.5. Test for quality of spraying						NMCP/GHS
		Activity 3.2.6. Conduct review meeting						NMCP/GHS
	Strategy 3: Environmental management	Activity 3.3.1. Engage district stakeholders (District Assembly and Environmental Health Officers)						NMCP/GHS
		Activity 3.3.2. Conduct community sensitisation on basis environmental management practices for malaria control						NMCP/GHS
		Activity 3.3.3. Conduct environmental management activities for breeding sites not eligible for larviciding (drains, stagnant water etc.)						NMCP/GHS

		Activity 3.3.4. Engage relevant ministries whose activity results in potential breeding sites						NMCP/GHS
	Strategy 4: Entomological monitoring for larval source management	Activity 3.4.1. Conduct larval density tests						NMCP/GHS
		Activity 3.4.2. Conduct adult collection to assess densities post larviciding						NMCP/GHS
Objective 4: Provide scientific evidence to guide planning and decision making on vector control interventions	Strategy 1: Entomological surveillance	Activity 4.1.1. Conduct insecticide susceptibility tests in sentinel sites						NMCP/GHS
		Activity 4.1.2. Conduct mosquito collection (pyrethrum spray catches, human landing catches, light traps etc.) in sentinel sites for primary and advanced studies						NMCP/GHS
		Activity 4.1.3. Do molecular analysis on test samples						NMCP/GHS
	Strategy 2: Operational research	Activity 4.2.1. Conduct end user survey for mass campaign						NMCP/GHS
		Activity 4.2.2. Do impact studies on larval source management						NMCP/GHS
		Activity 4.2.3. Do impact studies on IRS						NMCP/GHS
Objective 5. Increase the options of prevention by	Strategy 1. New vector control tools or products (sterile	Activity 5.1.1. Conduct field trials on the efficacy of new tools for inclusion in Integrated Vector Management Strategy						NMCP/GHS
		Activity 5.1.2. Engage relevant ministries, agencies or regulators						NMCP/GHS

promoting the use of other approved vector control interventions and tools	insect technique, eave tubes, ATSB)	Activity 5.1.3. Engage commercial entities with new vector control tools						NMCP/GHS
		Activity 5.1.4. Engage community on acceptance of new tool						NMCP/GHS
	Strategy 2: Housing improvement	Activity 5.2.1. Engage Department of Town and Country Planning						NMCP/GHS
		Activity 5.2.2. Engage Ministry of Works and Housing						NMCP/GHS
Objective 6. Provide technical oversight and coordination for vector control activities	Strategy 1. Technical meetings	Activity 6.1.1. Conduct Malaria Vector Control Oversight Committee meetings						NMCP/GHS
		Activity 6.1.2. Conduct ITN sub-committee meetings						NMCP/GHS
		Activity 6. 1.3. Conduct ITN task force meetings						NMCP/GHS
		Activity 6.1.4. Conduct National Insecticide Resistance Monitoring Partnership meetings						NMCP/GHS

Table 5.2: Work plan: Malaria in pregnancy (IPTp)

Sub-Objective	Strategy	Main Activities	2021	2022	2023	2024	2025	Person/ Agency Responsible
Objective 1: Have SP available at all service delivery points for DOT at every ANC visit	Strategy 1.1. : Improve quantification of SP at all levels	Activity 1.1.1. Training on logistics management and supply chain including GhiLMIS as part of case management once every two years for pharmacists/dispensary technicians, midwives and RMS managers (10 or 16)						NMCP, SSDM, P&S, development partners
		Activity 1.1.2. Regional health teams to liaise with RMS to ensure that SP stocks in facilities are collated and analysed every other month before submission to the temporal central medical store						Regional Malaria Focal Person(RMFP), Regional Supply Manager, (Regional team)
		Activity 1.1.3. Request for feedback and follow-up on the RMFP to ensure that SP is being compiled on a monthly basis						NMCP, SSDM
		Activity 1.1.4. Distribution of SP to health facilities (private and public)						SSDM, P&S
		Activity 1.1.5. Quarterly monitoring and supportive supervision to identify facilities with SP stocks-outs and low IPTp coverage						NMCP, SSDM, P&S

		Activity 1.1.6. Quarterly feedback/review meetings to review SP requisitions from RMS to central level and supplies of SP from central level to RMS (total of 20 over the five-year period)						NMCP, SSDM, P&S
	Strategy 1.2: Ensure all facilities providing ANC services (private and public) are provided with SP-IPTp through Last Mile Distribution	Activity 1.2.1. Advocacy meeting with stakeholders – CHAG, private etc. – on the need to collaborate with GHS to access programme commodities						NMCP, development partners
		Activity 1.2.2. Districts and sub-districts to register all non-registered private facilities with the RMS. Registration is updated bi-annually						RMFP, Regional Supply Manager (regional team); District Malaria Focal Person(DMFP), district pharmacists/logisticians (district teams)
		Activity 1.2.3. District focal persons to liaise with district pharmacists or logisticians to review and collate all request requisition Issue and receipt voucher for onward submission to the RMS bi-monthly						Regions and districts

		Activity 1.2.4. District-level quarterly analysis of implementation of Last Mile Distribution. Analysis to include the districts served, number of facilities requesting SP, quantities requested and supplied, challenges, routes covered and timeliness of the schedule						Regions and districts
		Activity 1.2.5. Strengthening of collaboration between various units (Pharmacy, Records, Public Health, ANC) involved in effective implementation of IPTp						Facility/unit in charges of the listed facilities
	Strategy 2.1: Ensure the availability of free SP	Activity 2.2.1. All pregnant women making their ANC visit should be given SP as DOT before they leave the midwife's station						NMCP, FHD, development partners
		Activity 2.2.2. Quarterly meetings to review SP requisitions from the facilities to central level and supplies of SP from central level to the facilities (total of 20 over the five-year period)						SSDM, P&S, NMCP
		Activity 2.2.3. Quarterly monitoring and supportive supervision to identified facilities with stocks-outs of SP and low IPTp coverage						NMCP, SSDM, PPME

	Strategy 2.2: Ensure availability of appropriate data-capturing tools at all times	Activity 2.3.1. Print and distribute ANC registers, Midwives form A, and IPTp and ITN tally books						NMCP, SSDM, PPME
Objective 3: Strengthen capacity for all relevant staff in IPTp implementation	Strategy 3.1: Pre-service training	Activity 3.1.1. Advocate and engage with training institutions for MIP trainings to be made a requirement for students						NMCP, development partners
		Activity 3.1.2. Develop curriculum/training manual for training institutions and training of the tutors every two years						Heads of training institutions, NMCP, development partners
		Activity 3.1.3. Train 100% of final-year students in training institutions such as nursing and midwifery schools, public health schools, medical schools, public health nursing training schools, BSc Public Health and pharmacy schools as well as the training of postgraduate training programmes, e.g. OBGYN residency training, family medicine residency training etc.						Heads of training institutions, NMCP, development partners

	Strategy 3.2: In-service training	Activity 3.2.1. Engage regulatory bodies such as Medical and Dental Council, Nursing and Midwifery Council and Pharmacy Council to make MIP compulsory for Continuous Professional Development points						Heads of the professional groups/bodies
		Activity 3.2.2. Train medical officers (1199), pharmacists (996) and midwives (4542) on MiP/IPTp implementation every other year						NMCP, regions, development partners
	Strategy 3.3: Monitoring and evaluation	Activity 3.3.1. Periodic investigations to understand issues related to uptake of IPTp						NMCP, development partners
		Activity 3.3.2. Post-training follow-up						NMCP, development partners
		Activity 3.3.3. Investigation of possible side effects of SP amongst beneficiaries						NMCP, FDA, development partners
		Activity 3.3.4. Quarterly supportive supervision to targeted facilities						NMCP, PPME, development partners
Objective 4: Review and update the	**Strategy 4.1: Targeted materials for print, videos, social medial, radio and TV**	Activity 4.1.1. Design a radio advert campaign (that comprises 1 English version and 7 local language versions)						NMCP, Health Promotion Division (HPD), development partners

appropriate protocols		Activity 4.1.2. Air the radio advert campaign at varying intensities and coverage to encourage women to take five doses of SP during pregnancy						NMCP, HPD, development partners
	Strategy 4.2: Working though NGOs	Activity 4.2.1. Collaborate with SBCC unit for this activity						NMCP, development partners
	Strategy 4.3: Review and update the appropriate protocol	Activity 4.3.1. Develop MIP protocols, job aids, monitoring charts and IPTp/ITN tally books for IPTp that can be accessed through multiple channels, e.g. online portal, app, etc.						NMCP, FHD, PPME, development partners
		Activity 4.3.2. Distribute/make available protocols, job aids, monitoring charts and IPTp/ITN tally books through multiple channels						NMCP, SSDM, P&S, development partners
		Activity 4.3.3 Develop app or online portal for easy access to protocols, job aids and guidelines						NMCP, IT, development partners
		Activity 4.3.4. Regularly update the guidelines /protocols etc.						NMCP, FHD,FDA, Pharmacy Council, development partners
		Activity 4.3.6 Do quarterly monitoring of the distributed documents and data in DHIMS						NMCP, PPME, development partners
Objective 5: Ensure		Activity 5.1.1. Pharmacovigilance on the side effects of SP						FDA, NMCP, all facilities offering ANC

enhanced reporting on side effects of SP-IPTp for improvement in SP uptake	Strategy 5.1: Enhance pharmacovigilance on the side effects of SP	Activity 5.1.2. Reporting of side effects of SP						FDA, NMCP
Objective 6: Strengthen CHPS level IPTp-SP implementation for increased uptake and continuity of care	Strategy 6.1: Strengthen CHN/CHO role in IPTp-SP implementation in the community (identification, screening for G6PD, referral and follow-up) of pregnant women	Activity 6.1.1. Define which category of pregnant women can receive 1st dose of IPTp at the CHPS level and which clients should receive continuum of care as 2nd, 3rd, 4th 5th dose						PPME, CHPS Unit, FHD, NMCP, development partners
		Activity 6.1.2. Incorporate CHPS level IPTP-SP implementation into the e-tracker						PPME, FHD, NMCP, development partners
	Strategy 6.2: Develop appropriate forms and registers to capture community level IPTp	Activity 6.2.1. Revise home visit registers to capture IPTp doses given in the community during community outreach/home visits						PPME, CHPS Unit, NMCP, development partners
		Activity 6.2.2. Print revised home visit registers						SSDM, P&S, NMCP, PPME
		Activity 6.2.3. Distribute home visit registers to all CHPS compounds/zones						SSDM, PPME, NMCP

Table 5.3: Work plan: Seasonal malaria chemoprevention

Sub Objective	Strategy	Main Activities	Year 1	Year 2	Year 3	Year 4	Year 5	Person/Agency Responsible
	Strategy 1.1.a Improve coordination at all levels	Activity 1.1.1. Macro-planning a. Establish national coordinating committee b. Organise national implementation planning meeting c. Organise regional-level planning meeting						NMCP/GHS
		Activity 1.1.2. Micro-planning 2.1 Organise district micro-planning meeting 2.2 Review previous district campaign exercise						NMCP/GHS
Objective 1: 1.1. To dose at least 80% of target population receive at least three rounds of an SMC per year	Strategy 1.1.b Complement door-to-door approach with mobile fixed point to dose hard-to-	Activity 1.1.3. Identify and map the hard-to-reach areas within the implementing districts						NMCP/GHS
		Activity 1.1.4. Identify and employ appropriate means of transport						NMCP/GHS

1. At least 80% of estimated populations are dosed per round 2. At least 95% of registered populations are dosed per round 3. At least 95% of children reached receive at least three doses (days) of SMC per round (Adherence)	reach populations	**Activity 1.1.5.** Use appropriate social mobilisation strategies within hard-to-reach areas						NMCP/GHS
		Activity 1.1.6 Quantify and deploy appropriate logistics (life jackets, canoes, motorbikes)						NMCP/GHS
		Activity 1.1.7 Set up mobile fixed point for dosing						NMCP/GHS
		Activity 1.1.8 Training Conduct training of trainers at the regional level Conduct training of supervisors and volunteers (district and sub-district) Organise IT boot camp Conduct training on logistics and supply chain management Develop and update training tools and implementation guidelines and make them available						NMCP/GHS
		Activity 1.1.9. Dosing Use electronic data collection tool for registration and data capture Administer SMC medicines using door-to-door approach Provide supportive supervision at all levels Ensure quality data (mining and cleaning)						NMCP/GHS
		Activity 1.1.10 Post-review Conduct post-SMC campaign meetings at the district and regional levels after every round						NMCP/GHS

		Activity Evaluation Review SMC data and conduct beginning, mid-term (after 3 years) and end-term (after 5 years) impact assessment of SMC campaign						NMCP/GHS
Objective 2: Improve pharmacovigilance	**Strategy 2.1.** Capacity building on pharmacovigilance	Activity 2.1.1. Organise meeting to sensitise clinicians on pharmacovigilance prior to SMC implementation (with emphasis on how facility can get reimbursement for ADRs treated)						NMCP/GHS
		Activity 2.1.2. Include pharmacovigilance in staff durbars and in-service training						NMCP/GHS
		Activity 2.1.3. Use social media platform to continue clinician sensitisation throughout SMC						NMCP/GHS
		Activity 2.1.4. Train community volunteers on how to identify, refer and report ADRs						NMCP/GHS
	Strategy 2.2. Improve logistics for pharmacovigilance	Activity 2.2.1. Quantify, procure and distribute medicines for managing ADRs						NMCP/GHS
		Activity 2.2.2. Quantify, print and distribute ADR reporting forms						NMCP/GHS
	Strategy 2.3 Increase surveillance on pharmacovigilance	Activity 2.3.1 Identify ADRs						NMCP/GHS
		Activity 2.2.5. Manage ADRs promptly						NMCP/GHS

Objective 3: To increase the acceptability of SMC within communities	**Strategy 3.1.** Improve communication and advocacy amongst stakeholders	Activity 3.1.1. Other stakeholders (community opinion leaders, CSOs, NGOs) a. Identify relevant stakeholders b. Organise stakeholders engagement meetings c. Assign roles and responsibilities to stakeholders d. Do regular follow-up on assigned roles and responsibilities of stakeholders						NMCP/GHS
		Activity 3.1.2. Educate health workers on SMC a. Include SMC in In-service trainings and clinical meetings b. Organise staff durbar prior to SMC implementation						NMCP/GHS
		Activity 3.1.3. Educate community volunteers on SMC a. Identify appropriate volunteers b. Organise volunteer training on SMC prior to implementation and before every round						NMCP/GHS
		Strategy 3.1. Total						
	Strategy 3.2. Increase awareness and knowledge amongst caregivers	Activity 3.2.1. Educate caregivers on SMC a. Organise community durbars b. Develop jingles and air on radio/radio discussions c. Make announcements/key messages in churches and mosques d. Include SMC discussions during Child Welfare Clinic sessions e. Make mobile van announcements at market areas and community f. Use other channels such as roof-top announcements and gong beatings						NMCP/GHS
		Activity 3.2.2. Use community volunteers to educate caregivers on the importance of taking all rounds of SMC						NMCP/GHS

		Activity 3.2.3. Use community volunteers to educate caregivers on adherence (3 doses per round)						NMCP/GHS
		Activity 3.2.4. Use health workers, FDA officials and community volunteers to educate caregivers on ADRs and their management						NMCP/GHS

Objective 2: Provide appropriate diagnosis to all suspected malaria cases and prompt and effective treatment to 100% of confirmed malaria cases in accordance to treatment guidelines by 2025

Table 5.4: Work plan: Case management

Objective/SubObjective	Strategy	Main Activities	Timeline					Person/ Agency Responsible
			Year 1	Year 2	Year 3	Year 4	Year 5	
To Provide appropriate diagnosis to all suspected malaria cases and prompt and effective treatment to all	Strategy 1: Provide quality malaria diagnosis at all levels of care (including quasi-governmental facilities)	Activity 1.1. Provide quality logistics						
		Activity 1.1.1 Procure and supply necessary equipment for malaria microscopy and RDT a. Functional microscopes b. pH meter/pH test strips c. Calibrated micropipettes (1–10 µl range) d. Hand-held tally counters						Clinical Laboratory Unit CLU/NMCP

confirmed cases in accordance with treatment guidelines by 2025.								
		Activity 1.1.2 Procure and supply necessary reagents a. Quality Giemsa stain b. Buffer tablet, absolute methanol, high-grade glycerol						CLU/NMCP
		Activity 1.1.3 Procure and supply RDTs at facilities (point of care)						CLU/NMCP
		Activity 1.2 Activity 2: Build capacity of lab personnel						CLU/NMCP
		Activity 1.2.1 Train lab staff in malaria microscopy						CLU/NMCP
		Activity 1.2.2 Train health workers in glucose-6-phosphate dehydrogenase (G6PD) testing						CLU/NMCP
		Activity 1.2.4 Train lab and non-lab staff in the use of malaria rapid diagnostic testing (RDT)						CLU/NMCP
		Activity 1.2.5 Post-training supervision of lab staff and other health workers on application of training skills						CLU/NMCP

		Activity 1.2.6 Assess competence of lab staff as regional facilitators /supervisors for training and supervision through national competency assessment of malaria microscopists (NCAMM) program						CLU/NMCP
		Activity 1.2.7 Assess competence of lab staff as national facilitators for trainings through external competency assessment of malaria microscopists (ECAMM)						CLU/NMCP
		Activity 1.3 Do quality assurance						CLU/NMCP
		Activity 1.3.1 Do OTSS						CLU/NMCP
		Activity 1.3.2 Design a proficiency testing scheme						CLU/NMCP
		Activity 1.3.3 Cross-check blood slides						CLU/NMCP
		Activity 1.3.4 Update the malaria slide bank (replacement of lost slides, rare species availability, broken slides)						CLU/NMCP
		Activity 1.3.5 Update the malaria slide bank (replacement of lost slides, rare species availability, broken slides)						CLU/NMCP
		Activity 1.3.6 Ensure efficient running of the malaria slide bank by providing computers and database						CLU/NMCP
		Activity 1.3.7 Evaluate and validate RDTs to be used						CLU/NMCP
		Activity 1.3.8 Ensure lot testing of RDTs before shipping RDTs into the country						CLU/NMCP

		Activity 1.3.9 Conduct post-distribution lot testing of RDTs after delivery						CLU/NMCP
		Strategy 1.1. Total						
	Strategy 2: Strengthen health care worker capacity in malaria case management at health facilities	Activity 2.1.Capacity building						
		Activity 2.2 Supportive supervision (data-driven based on stratification)						NMCP
		Activity 2.2.1 Clinical OTSS; CHAG = 228; Gov't = 6801; Faith-based = 1; Private = 905 ; Quasi-gov't = 53 (from DHIMS)						
		Activity 2.2.2 Lab OTSS 555 activities lab (private and public)						NMCP
		Activity 2.2.3 Integrated supportive supervision						NMCP
		Activity 2.2.4 Data visualisation and use of data for decision making at the facility level						NMCP PPME-GHS
	Strategy 3: Strengthen pre-service health training institutions' capacity in malaria case management	Activity 3.1 Update tutors from targeted health training institutions on current guidelines for malaria						NMCP PPME-GHS/MoH
		Activity 3.1.1 Update pre-service curriculum						NMCP PPME-GHS/MoH
		Activity 3.1.2 Map all training institutions and identify eligible tutors						NMCP PPME-GHS/MoH

		Activity 3.1.3 Train eligible tutors						NMCP PPME-GHS/MoH
	Strategy 4: Build capacity and improve access to diagnosis and treatment in the private sector	Activity 4.1 Build capacity in malaria case management						NMCP GHS
		Activity 4.1.1 Map all eligible facilities (licensed chemical shops, pharmacies, private clinics, maternity homes and hospitals)						NMCP GHS
		Activity 4.1.2 Train all eligible facilities (licensed chemical shops, pharmacies, private clinics, maternity homes and hospitals) in malaria management relevant to the service being provided (including data capture and reporting)						NMCP GHS
		Activity 4.1.3 Do supportive supervision (clinical OTSS)						NMCP GHS
		Activity 4.2 Provide RDTs to private facilities						NMCP GHS
	Strategy 5: Strengthen quality management for severe malaria case management at all levels	Activity 5.1 Train Quality Improvement Team on data visualisation for decision making						NMCP & Quality Assurance Department(QAD) -ICD
		Activity 5.2 Train hospital Quality Improvement Teams and other service providers on severe malaria, triaging and quality improvement methodologies/tools to implement quality improvement activities on severe malaria case management						NMCP & QAD-ICD

		Activity 5.3 Conduct coaching visits to Quality Improvement Teams implementing quality improvement activities on severe malaria case management						NMCP & QAD-ICD
		Activity 5.4 Train targeted hospitals' lab staff and other RDT users on Malaria Diagnostic Waste Management						NMCP & QAD-ICD
		Activity 5.5 Procure and distribute a minimum package of basic equipment for emergency care for severe malaria in targeted facilities (glucometer, suction machine, pulse oximeter, oxygen concentrator, sphygmomanometer, thermometers, weighing scales)						NMCP & QAD-ICD
	Strategy 6: Increase access of health care delivery to communities with non-functional CHPS through collaboration with other division	Activity 6.1. Collaborate with other GHS divisions to improve functionality of CHPS zones						NMCP PPME-GHS/MoH
	Strategy 7a: Improve availability of guidelines, protocols, job aids 7b: Enforce adherence to guidelines at all levels	Activity 7.1 Develop protocols and guidelines making provision for minor regular update						NMCP PPME-GHS/MoH
		Activity 7.2 Develop guidelines dissemination plan and disseminate protocols and guidelines						NMCP PPME-GHS/MoH
		Activity 7.3 Disseminate minor guideline updates between comprehensive reviews						NMCP PPME-GHS/MoH

		Activity 7.4 Identify/describe magnitude of the problem of non-adherence (data DHIMS)						NMCP PPME-GHS/MoH
		Activity 7.5 Provide feedback on individual prescription behaviour						NMCP PPME-GHS/MoH
		Activity 7.6 SBCC team designed targeted intervention (pictures, messaging, prompts)						NMCP PPME-GHS/MoH

Objective 3: Ensure at least 95% of the population will use at least one malaria preventive measure, and 95% of those with fever seek care within 24 hours of onset of symptoms, by 2025

Table 5.5: Work plan: Social and behaviour change

Objective	Strategy	Main Activities	Timeline					Person/ Agency Responsible
			Year 1	Year 2	Year 3	Year 4	Year 5	

Objective 1: Increase demand for malaria services and correct misconceptions	Strategy 1: Advocacy with stakeholders for commitment to ensure malaria SBCC interventions are prioritised and supported	Activity 1.1.1 Lobby parliament to lead an agenda for optimisation of the importance SBCC in malaria interventions and for increased support						NMCP/GHS, MoH
		Activity 1.1.2 Lobby private sector for increase domestic support for malaria interventions						NMCP/GHS, MoH
		Activity 1.1.3 Lobby local government to release funds for malaria SBCC interventions						NMCP/GHS, MoH
		Activity 1.1.4 Organise regular planning meetings						NMCP/GHS, MoH
		Activity 1.1.5 Collaborate with traditional and religious leadership and celebrities to champion malaria resource mobilisation at all levels						NMCP/GHS, MoH
		Activity 1.1.6 Collaborate and build capacity of CSOs and NGOs to lobby for increased support (funding, logistics, equipment and technical) in malaria interventions						NMCP/GHS, MoH
		Activity.1.1.7 Provide policy and technical briefings once a month on malaria trends and interventions						NMCP/GHS, MoH
		Activity 1.1.8 Engage chiefs, queen mothers and other relevant stakeholders to influence behaviour change on all malaria control and prevention interventions						NMCP/GHS, MoH
	Strategy 2: Use mass media to engage the	Activity 2.1.1 Organise radio and TV discussions on issues related to malaria prevention and control						NMCP/GHS, MoH

	public on malaria control interventions	Activity 2.1.2 Air commercials (docudramas and human interest stories) on radio and TV nationwide						NMCP/GHS, MoH
		Activity 2.1.3 Broadcast announcements on malaria prevention and control measures through mobile vans and community information centres						NMCP/GHS, MoH
	Strategy 3: Strengthen community action for social mobilisation	Activity 3.1 Community health management committees develop community action plans						NMCP/GHS, MoH
		Activity 3.2 CHOs and volunteers conduct door-to-door education visits on malaria						NMCP/GHS, MoH
		Activity 3.3 Organise night screenings to educate communities on appropriate use of ITNs and other malaria prevention interventions.						NMCP/GHS, MoH
		Activity 3.4 Conduct school-based activities including skits, demonstrations and quizzes on malaria prevention interventions.						NMCP/GHS, MoH
		Activity 3.5 Conduct education sessions on malaria prevention at mosques and churches						NMCP/GHS, MoH
	Strategy 3. Total							
	Strategy 4: Use social media to engage youths on malaria	Activity 4.1. Planning meetings to organise the content and layout						NMCP/GHS, MoH
		Activity 4.2. Setting up of platforms						NMCP/GHS, MoH

	behaviour change activities	Activity 4.3. Hosting of platforms						NMCP/GHS, MoH
		Activity 4.4. Daily broadcasts of key messages on malaria prevention						NMCP/GHS, MoH
		Activity 4.5. Daily monitoring of public concerns and myths concerning malaria intervention especially ITN usage and IPTp uptake						NMCP/GHS, MoH
		Activity 4.6. Maintenance of platforms						NMCP/GHS, MoH
	Strategy 4. Total							
	Strategy 5: Develop malaria educational materials for SBCC	Activity 5.1. SBCC technical review committee reviews content of creative briefs						NMCP/GHS, MoH
		Activity 5.2. Develop/review SBCC materials on malaria prevention (posters, short clips, social media content, billboards, flyers, CDs, jingles, songs)						NMCP/GHS, MoH
		Activity 5.3. Pre-test draft materials						NMCP/GHS, MoH
		Activity 5.4. Produce materials (posters, short clips, social media content, billboards, flyers, CDs, jingles, songs)						NMCP/GHS, MoH
	Strategy 5. Total							
	Strategy 6: Strengthen capacity of health workers and stakeholders in both public and private institutions to effectively engage communities on	Activity 6.1 Organise national training of trainers for regional health promotion officer and malaria focal person interpersonal communication, social marketing and community engagement						NMCP/GHS, MoH
		Activity 6.2 Organise regional training for district health promotion officers and malaria focal						NMCP/GHS, MoH

	malaria issues at all levels	person on interpersonal communication, social marketing and community engagement						
		Activity 6.3 Organise district training for CHOs on interpersonal communication and community engagement						NMCP/GHS, MoH
		Activity 6.4 Orient civil society, non-government, and faith-based organisations on malaria interventions and social mobilisation						NMCP/GHS, MoH
		Activity 6.5 Train the media on malaria reportage and solicit their support in malaria interventions social mobilisation						NMCP/GHS, MoH
	Strategy 6. Total							
	7. Campaign on malaria interventions	Activity 7.1 Conduct pre-campaign planning meetings						NMCP/GHS, MoH
		Activity 7.2 Develop SBCC materials (T-shirts, stickers, leaflets, flyers, posters, banners, jingles, ID tags, fact sheets etc.)						NMCP/GHS, MoH
		Activity 7.3 Conduct training of trainers for national-level microplanning						NMCP/GHS, MoH
		Activity 7.4 Conduct regional training for district-level staff on microplanning						NMCP/GHS, MoH
		Activity 7.5 Train volunteers on interpersonal communication to undertake door-to-door sensitisation						NMCP/GHS, MoH
		Activity 7.6 Train School Health Education Programme (SHEP) coordinators to develop micro plans at all levels						NMCP/GHS, MoH
		Activity 7.7 Carry out social marketing activities to promote appropriate ITN usage and IPTp uptake						NMCP/GHS, MoH

		Activity 7.8 Launch National Malaria Campaign						NMCP/GHS, MoH
		Activity 7.9 Observe National Malaria Day						NMCP/GHS, MoH
		Activity 7.10 Use social and mass media to promote uptake and change influence behaviour change						NMCP/GHS, MoH
	Strategy 7. Total							
	8. Coordinate and implement a communication strategy	Activity 8.1 Develop a communication strategy for 2021-2025						NMCP/GHS, MoH
		Activity 8.2 Conduct consultation meetings with stakeholders to validate communication strategy						NMCP/GHS, MoH
		Activity 8.3 Hold malaria planning meeting with health promotion officers and stakeholders (NGOs, CBOs etc.) at the national, regional and district levels						NMCP/GHS, MoH
		Activity 8.4 Disseminate communication strategy to all levels and other implementing partners						NMCP/GHS, MoH
		Activity 8.5 Organise periodic SBCC coordination meetings						NMCP/GHS, MoH
		Activity 8.6 Organise quarterly monitoring activities on malaria						NMCP/GHS, MoH
		Activity 8.7 Organise periodic performance review meetings						NMCP/GHS, MoH
		Activity 8.8 Develop data collection tools for malaria SBCC activities						NMCP/GHS, MoH
		Activity 8.9 Conduct rapid assessment to assess effectiveness of malaria SBCC activities						NMCP/GHS, MoH

Objective 4: Strengthen and maintain capacity for governance and programme management to achieve programmatic objectives at all levels of the health care system towards malaria control and pre-elimination by 2025

Table 5.6: Work plan: Programme management

Objective	Strategy	Main Activities	Timeline					Person /Agency Responsible
			Year 1	Year 2	Year 3	Year 4	Year 5	
Objective : Strengthen and maintain capacity for governance and programme management to achieve programmatic objectives by 2025	**Strategy 1.1.** Enhance political will for malaria control and pre-elimination	Activity 1.1.1 Advocate to and engage the Select Committee on Health for inclusion of the malaria programme as a priority on their agenda to increase political buy-in						NMCP/GHS, MoH
		Activity 1.1.2 Re-vamp the Ghana Malaria Foundation and sustain resource mobilisation efforts						NMCP/GHS, MoH
		Activity 1.1.3 Identify malaria advocates and ambassadors for resource mobilisation						NMCP/GHS, MoH
		Activity 1.1.4 Identify and engage malaria advocates within the MoFEP to influence budgetary allocations/issues regarding the malaria programme						NMCP/GHS, MoH
		Activity 1.1.5 Engage CSOs in garnering political support for malaria elimination in Ghana						NMCP/GHS, MoH

	Strategy 2.1. Strengthen coordination and partnerships	Activity 2.1.1. Conduct annual regional review meetings						NMCP/GHS, MoH
		Activity 2.1.2. Re-establish Bi-annual Malaria Interagency Coordinating Committee (MICC) and working group meetings						NMCP/GHS, MoH
		Activity 2.1.3 Ensure integrated cross-border collaboration meetings with West African Health Organisation countries for a coordinated malaria response						NMCP/GHS, MoH
		Activity 2.1.4 Collaborate with West African Health Organisation to develop a cross-border strategy as part of pre-elimination						NMCP/GHS, MoH
		Activity 2.1.5 Collaborate with Ministry of Local Government and Rural Development, Ministry of Water Sanitation, Ministry of Environment , Ministry of Agriculture, Ministry of Roads and Transport on environmental larval source management						NMCP/GHS, MoH
		Activity 2.1.6 Engage CSOs in sanitation for environmental larval source management						NMCP/GHS, MoH
		Activity 2.1.7 Collaborate with Ministry of Education to review and update malaria control components in school curriculum and extracurricular activities						NMCP/GHS, MoH

		Activity 2.1.8 Strengthen relationship with teaching, quasi-governmental, private and CHAG facilities through collaboration with the Health Facilities Regulatory Authority and CSOs						NMCP/GHS, MoH
	Strategy 3.1. Build capacity for malaria control and pre-elimination	Activity 3.1.1 Conduct annual capacity needs assessment for NMCP staff						NMCP/GHS, MoH
		Activity 3.1.2 Conduct national and sub-national malaria reviews						NMCP/GHS, MoH
		Activity 3.1.3 Conduct mid-term and end-term programmatic reviews						NMCP/GHS, MoH
		Activity 3.1.4 Facilitate the attendance of NMCP staff at relevant training meetings and conferences at national and international levels						NMCP/GHS, MoH
		Activity 3.1.5 Collaborate with professional bodies to train tutors in health training institutions in emerging malaria control interventions						NMCP/GHS, MoH
		Activity 3.1.6 Hire one or two more staff to support the vector control team						NMCP/GHS, MoH
		Activity 3.1.7 Hire one staff to drive resource mobilisation efforts						NMCP/GHS, MoH

	Strategy 4: Supervise malaria programme implementation at all levels	Activity 4.2.1 Ensure distribution and use of all manuals, guidelines and tools developed at all levels of programme implementation						NMCP/GHS, MoH
		Activity 4.2.2 Conduct integrated supervision with partners at all levels of malaria programme implementation						NMCP/GHS, MoH
Improve ICT Support for implementing the NMSP 2021-2025	**Strategy 1:** Capacity building for IT officers.	Activity 5.1.1 Training for IT personnel in emerging technologies such as IT security, Disaster Recovery and Business Continuity, AI for Malaria Control						NMCP/GHS, MoH
	Strategy 2: Give staff and key departments the IT skills and knowledge that will enhance their use of technology effectively	Activity 5.2.1 ICT trainings for staff to equip them with basic ICT skills Activity 5.2.2 ICT trainings for M&E data managers						NMCP/GHS, MoH
	Strategy 3: Upgrade IT infrastructure to increase communication collaboration and transparency across the entire organisation to allow a more coordinated approach to service delivery through automation	Activity 5.3.1 Change internet network connectivity from copper connection to fiber connection						NMCP/GHS, MoH
		Activity 5.3.2 Purchase 80 brand new laptops, 10 all-in-one desktop computers, 10 printers for both staff and regional malaria focal persons						NMCP/GHS, MoH

		Activity 5.3.3: Purchase genuine permanent Microsoft 365 Office Suite and Windows 10 Operating System for networked cooperate laptops and desktops						NMCP/GHS, MoH
		Activity 5.3.4 Replace routers, switches and access points						NMCP/GHS, MoH
		Activity 5.3.5 Purchase annual subscription-based malware to protect computers and firewalls (software and hardware) to protect data transfers						NMCP/GHS, MoH
		Activity 5.3.6 Digitise all paper documents since 2006 at NMCP						NMCP/GHS, MoH

Objective 5: Ensure timely and adequate supply of quality-assured malaria commodities to all service delivery points by 2025

Table 5.7: Work plan: Procurement and supply chain management

Objective	Strategy	Main Activities	Person Responsible	Timeline				
				2021	2022	2023	2024	2025

Ensure continued availability of quality malaria commodities at all levels of service delivery points by 2025	Strategy 1.1. Ensure accurate and timely forecasting and supply planning of malaria commodities	Activity 1.1.1 Conduct annual forecasting, quantification and supply planning based on accurate consumption data	SSDM, P&S, NMCP, development partners and private sector					
		Activity 1.1.2 Conduct quarterly update of supply plan to inform supply decisions	SSDM, P&S, NMCP, development partners and private sector					
		Activity 1.1.3 Conduct semiannual review of forecasting and quantification data	SSDM, P&S, NMCP, development partners and private sector					
		Activity 1.1.4 Conduct quarterly monitoring and update of supply plans	SSDM, P&S, NMCP					
		Activity 1.1.5 Advocate for appropriate tools for forecasting and supply planning at all levels	SSDM, P&S, NMCP, development partners					
		Activity 1.1.6 Conduct refresher training for national level P&SC personnel in new tools and processes for quantification	SSDM, P&S, NMCP, development partners					
		Activity 1.1.7 Conduct training and refresher trainings for pharmacist, dispensary technicians and midwives on SP management at lower levels	SSDM, NMCP					
	Strategy 1.2. Total							
	Strategy 1.2: Advocate for effective procurement and	Activity 1.2.1. Implement Ghana Electronic Procurement System (GHANEPS) for in-country procurement of quality-assured malaria commodities	SSDM, Public Procurement Authority (PPA)					

	timely delivery of malaria commodities	Activity 1.2.2 Strengthen capacity for supply chain operators at all levels	SSDM, P&S, NMCP, development partners					
		Activity 1.2.3 Advocate for funding to procure 100% of needed malaria commodities (SPs, RDTs, LLINS and ACTs)	PPME-GHS, PPME-MoH, P&S, NMCP, development partners					
		Activity 1.2.4 Use of pooled procurement at national level	SSDM, P&S, PPA					
		Activity 1.2.5 Support the implementation of framework contracting	SSDM, P&S, PPA					
	Strategy 1.2. Total							
	Strategy 1.3: Advocate for efficient warehousing and sustainable distribution system across the supply chain	Activity 1.3.1 Advocate for optimisation of warehousing facilities at all levels	SSDM, P&S					
		Activity 1.3.2 Integrate all malaria commodities (LLINs and SPs) into Last Mile Distribution	SSDM, P&S, development partner					
		Activity 1.3.3 Support the sustainability of Last Mile Distribution in all regions	SSDM, P&S, development partners					
		Activity 1.3.4 Disseminate IEC materials and other non-consumable malaria logistics to all districts	NMCP, SSDM					
		Activity 1.3.5 Conduct semi-annual monitory and supervision to service delivery points to check on availability of IEC materials and other non-consumable malaria logistics	NMCP,SSDM					

	Strategy 1.4. Strengthen quality assurance systems for malaria commodities	Activity 1.4.1. Continue quality monitoring for malaria commodities	FDA,SSDM,P&S					
		Activity 1.4.2. Conduct half-yearly quality audit of QA processes at all levels	FDA, SSDM, P&S					
	Strategy 1.5. Support full implementation of GhiLMIS for the provision of accurate and timely supply chain information for decision making at all levels	Activity 1.5.1 Support full roll-out and use of GhLMIS at lower-level heath facilities	SSDM, development partners					
		Activity 1.5.2 Advocate for the full roll-out and use of GhiLMIS	SSDM					
		Activity 1.5.3 Extract monthly inventory report from GhiLMIS for analysis and decision making at all levels	SSDM					
		Activity 1.5.4 Conduct quarterly monitoring and supervision of the operation of GhiLMIS at all levels	SSDM, P&S, development partners					
		Activity 1.5.5 Conduct refresher training for officers at lower levels for quality-assured data capture onto the GhiLMIS platform	SSDM, P&S, development partners					
		Activity 1.5.6 Conduct semi-annual data quality assessment on GhiLMIS at all levels	SSDM, P&S, development partners					
		Activity 1.5.7 Collate and validate data entered on GhiLMIS at lower levels by the end of every month for decision making at the national level	Regions, NMCP					

	Strategy 1.6. Strengthen the capacity of health care workers involved in commodity management at sub-national levels	Activity 1.6.1 Conduct annual refresher trainings in commodity management for health workers at service delivery points	SSDM, P&S, development partners					
		Activity 1.6.2 Advocate for integration of supply chain components into NMCP's quarterly monitoring and supervision plan	NMCP					
	Strategy 1.7. Ensure a proactive governance structure and policy adherence system to promote an effective malaria supply chain	Activity 1.7.1 Engage private sector to develop a roadmap for the supply of, and reporting on RDTs and SPs	NMCP					
		Activity 1.7.2 Develop a policy on the supply of RDTs and SPs to private sector	NMCP,SSDM, P&S and development partners					
		Activity 1.7.3 Advocate for the establishment and use of a robust system for product quality monitoring	FDA,SSDM,P&S					

Objective 6: Improve mobilisation of resources and maximise the efficient use of available resources for greater public health impact by 2025

Table 5.8: Work plan: Finance and resource mobilisation

Objective	Strategic Intervention	Main Activities	Timeline					Person / Agency Responsible
			2021	2022	2023	2024	2025	
Objective 1: Advocate for increased government financial allocation to malaria control and pre-elimination	Strategy 1.1: Keep malaria financing high on the political agenda	Activity 1.1.1. Develop issue briefs on malaria progress updates, challenges and the way forward and disseminate to members of Parliament who sit on the Select Committee on Health and to the MoFEP						NMCP, GHS/MoH,
		Activity 1.1.2. Develop an investment case on malaria financing issues and co-financing needs and disseminate to members of Parliament on Select Committee on Health and Malaria Caucus						NMCP, GHS/MoH,
		Activity 1.1.3. Conduct bi-annual briefing sessions with the Parliamentary Select Committee on Health and Malaria Caucus on progress, challenges and proposed interventions including policy and tax measures to ensure sustained financing						NMCP, GHS/MoH,

	Strategy 1.1. Total							
	Strategy 1.2: Strengthen accountability measures related to the 0.5% District Assembly Common Fund funding for malaria to ensure appropriate allocation of malaria funding at the district level	Activity 1.2.1. Engage appropriate government bodies (Ministry of Local Government and Rural Development, DCAF Secretariat) and CSOs to review all policy documents related to the 0.5%, including review of budget line items and expenditures to date to assess applicability of funds for malaria projects						NMCP, Ministry of Local Government and Rural Development, CSOs
		Activity 1.2.2. Participate in Metropolitan Municipal and District Assembly meetings to share progress, challenges and recommendation on malaria control activities particularly regarding use of funds from the District Assembly Common Fund						NMCP, Metropolitan Municipal and District Assemblies
		Activity 1.2.3. Engage Parliamentary Select Committee on Health to advocate for accountability mechanism to ensure effective use of allocated resources						NMCP/GHS, MoH
		Activity 1.2.4. Develop and organise a briefing package for Select Committee on Health and Malaria Caucus and hold a briefing meeting, with appropriate follow-up as required; this will include advocacy to increase the District Assembly Common Fund allocation						NMCP/GHS, MoH, ARM Committee

		Activity 1.2.5. Engage CSOs to lead a nationwide district-level monitoring of malaria funding to assess the amount of domestic funds for malaria reaching the community level, enabling evidence building for high-level advocacy						NMCP/GHS
		Strategy 1.2. Total						
	Strategy 1.3: Assess and adopt innovative financing mechanisms [non-traditional] to address decreasing donor funding	Activity 1.3.1. Assess potential innovative financing mechanisms that are applicable for health more broadly with impacts on malaria specifically						NMCP/GHS, MoH, AdvoResMob Committee
		Activity 1.3.2. Develop a roadmap for adopting financing mechanisms: remittances, percentages of existing taxes, etc.						NMCP/GHS, MoH, AdvoResMob Committee, and partners
		Activity 1.3.3. Conduct briefings with high-level leaders, including the Select Committee on Health, for adoption of these innovative financing mechanisms for malaria						MoFEP, Ghana Revenue Authority,
		Strategy 1.3. Total						
Objective 2: Increase private sector contribution to at least 20% of the	Strategy 2: Accelerate the implementation by GMF to contribute to malaria control	Activity 2.1.1. Review and disseminate a new GMF governance structure and terms of reference						NMCP/GHS
		Activity 2.1.2. Facilitate GMF board meetings						NMCP/GHS, MoH

NMSP for malaria control and pre-elimination by 2025	and elimination activities from private sector	Activity 2.1.3. Provide technical assistance to the GMF to develop a NMSP that outlines private sector investment options to contribute to NMSP need						NMCP/GHS, Partners
		Activity 2.1.3. Provide support to the GMF to strengthen dialogues between the GMF, the MoH and the MOFEP to assist companies to receive tax credits and/or waivers for their investment in malaria (e.g. provide technical assistance to the GMF to develop a structure (via agreement with the MOF/Ghana Revenue Authority) that allows investors easy access to tax incentives						NMCP/GHS, Partners
		Activity 2.1.4. Engage political leadership to explore opportunities for tax incentives for private sector investment to fill NSP need, with linkages to the Ghana Beyond Aid agenda						NMCP/GHS, MoH, GMF
		Activity 2.1.5. Identify geographic or administrative bounded areas that can be clearly assigned to specific private sector companies as “their responsibility to cover”						NMCP/GHS, MoH
		Activity 2.1.6. Develop and disseminate advocacy tools such as business and investment cases per sector , brochures, PPTs that promote the benefits of investing in malaria NSP via the GMF						NMCP/GHS, MoH

		Activity 2.1.7. Develop malaria prevention frameworks for different industries to take small projects to scale under GHS authority (e.g. mandating through the Chamber of Mines to all mining companies, and incentivising expansion)						NMCP/GHS, MoH
		Activity 2.1.7 Conduct private sector and philanthropist mapping to develop a more comprehensive list of potential donors for engagement						NMCP/GHS, MoH
		Activity 2.1.8 Constitute a Technical Oversight Committee with linkages to the GMF for public-private partnerships to ensure private sector contributions fill gaps in the NMSP						NMCP/GHS, MoH
Objective 3: Increase visibility of malaria programmes and raise public awareness and ownership about malaria	Strategy 3: Enhance coordination of malaria advocacy and resource mobilisation	Activity 3.1.1 Facilitate Advocacy and Resource Mobilisation advisory committee meetings						NMCP/GHS, MoH
		Activity 3.1.2 Identify and engage key champions at levels/sectors (entertainment, sports, education, media, politics, tradition, religion, community, etc.) to promote malaria control and pre-elimination as a national development agenda						NMCP/GHS, MoH
		Activity 3.1.3. Facilitate annual, national journalist award for best coverage of malaria issues						NMCP/GHS, MoH

Objective 7: Strengthen malaria surveillance and M&E system towards the 2025 malaria control targets

Table 5.9: Work plan: Surveillance, monitoring and evaluation

OBJECTIVE	STRATEGY	ACTIVITIES	INSTITUTION/ PERSON RESPONSIBLE	TIMELINES				
				2021	2022	2023	2024	2025
		Development and printing of training materials	NMCP, GHS/PPME					
Strengthen malaria SM&E system to ensure timely availability of high-quality, consistent and relevant malaria data at all levels (health facilities [public, private, quasi-gov't]) and 50% pharmacies and OTCMS Seller) in order to track the progress of the malaria	Strengthening technical capacity for surveillance of malaria control at all levels	Training of regional-level staff / facilitators (TOT) on data management and use	NMCP, GHS/PPME					
		Training of district-level staff by regional facilitators/data managers on data management and use	RHMT/HIO, Malaria Focal Person					
		Training of facility-level staff by district facilitators/data managers on data management and use (public sector including teaching hospitals, quasi-governmental and CHAG)	DHMT/HIO, Malaria Focal Person					
		Training of facility-level staff by district facilitators/data managers on data management and use (private sector)	DHMT/HIO, Malaria Focal Person					
		Supervision of trainings of district-level trainings by national-level staff	NMCP, GHS/PPME					

control and prevention interventions towards the 2025 malaria control targets		Supervision of trainings of facility data managers by national-level staff (Public and Private sectors)	NMCP, GHS/PPME					
		Training for new facility staff on DHIMS (Including the Malaria Integrated Dashboard) and reporting tools	DHMT/HIO, Malaria Focal Person					
		Pre-service training on malaria data management using DHIMS; on malaria registers, reporting forms and indicators	NMCP, GHS/PPME					
		Upgrading of staff on new SM&E courses (national and international)	NMCP					
		Advocacy for recruitment of staff with data management competencies in private sector	GHS, RDHS					
	Strengthening the logistics structure for surveillance at all levels	Improve internet infrastructure at districts	NMCP/ GHS, RDHS					
		Upgrade ICT infrastructure. Establish a back-up system (server, applications and accessories)	PPME/GHS, NMCP					
		Procure computers, printers and accessories for data management at national level	NMCP					
		Procure computers, printers and accessories for data management sub-national levels	GHS, RDHS					
		Support maintenance of ICT infrastructure at NMCP; external / flash drives, procure corporate antivirus software	NMCP					
	Improve malaria quality assurance system at all levels	Develop/Update standardised SM&E procedures, tools and guidelines (including standard operating procedures and data utilisation manual)	NMCP, GHS/PPME					
		Print malaria data reporting tools and guidelines	NMCP					

		Conduct monthly data verification meeting at all levels	PPME/GHS, NMCP					
		Roll out data quality audits at district level	DHMT, RHMT, NMCP, PPME/GHS					
	Establish malaria SM&E system for pharmacies and OTCMS	Develop appropriate data management system for pharmacies and OTCMS, including data collection tools	NMCP, PPME/GHS, Pharmacy Council, RHMT,DHMT					
		Conduct training of trainers for pharmacies and OTCMS regulatory bodies on data management	NMCP, PPME/GHS, Pharmacy Council, CPPA					
		Conduct training for pharmacies and OTCMS staff on data management	NMCP, PPME/GHS, Pharmacy Council, CPPA					
		Supportive supervision for the implementation of pharmacies and OTCMs on data reporting	NMCP, PPME/GHS, Pharmacy Council, CPPA					
		Conduct joint periodic review meetings with OTCMs and pharmacies to assess performance and provide update on control intervention (including reviewing the tools)	NMCP, Pharmacy Council, CPPA					
	Intensify malaria surveillance in the selected districts for pre-elimination	Conduct monthly data quality audit for malaria mortality and morbidity	NMCP, RHD, DHD					
		Establish system for outbreak response						
		For areas within pre-elimination; API and SPR <5% in two consecutive years.						

		Migrate reporting system to case-base reporting at all service delivery sites (e-tracker)	NMCP, PPME/GHS					
		Intensify response and surveillance activities in the targeted areas	NMCP, PPME/GHS					
		Undertake reactive case detection and response	NMCP, RHD, DHD, Facilities					
	Strengthening surveillance at sentinel sites	**A. Anti-malarial drug efficacy**						
		Conduct data collection (10 health facilities)	NMCP, NMIMR					
		Quarterly monitoring (10 health facilities)	NMCP, NMIMR					
		Conduct orientation for new staff at all sites procedures on anti-malaria drug efficacy	NMCP, NMIMR					
		B. Parasite prevalence monitoring						
		Quarterly monitoring (30 health facilities)	NMCP, NMIMR					
		Bi-annual review meeting for feedback from monitoring, discuss implementation challenges, sharing best practices and lesson learnt	NMCP, NMIMR					
		Conduct orientation for new staff at all sites procedures on parasite prevalence study	NMCP, NMIMR					
		C. Entomological monitoring (Insecticide resistance monitoring Inoculation Rate Monitoring)						
		Monthly monitoring/data collection (30 sites)	NMCP, NMIMR					
		Bi-annual review meeting for feedback from monitoring, discuss implementation challenges, sharing best practices and lesson learnt	NMCP, NMIMR					

		Conduct orientation for new staff at all sites procedures on entomological surveillance and insecticide resistance	NMCP, NMIMR					
	Operational Research to inform programme direction	Conduct Health Facility Survey (service diagnosis, staffing, logistics, patient satisfaction)	NMCP,RDD					
		Conduct IPTp impact studies	NMCP					
		Undertake Impact Assessment of SMC	NMCP					
		Rapid Impact Assessment of Malaria Control Interventions in the country	NMCP, WHO					
		Conduct Efficacy and Durability Assessment of LLIN Monitoring	NMCP, NMIMR					
		Assess factors influencing acceptance of larvae source management	NMCP, Zoomlion, NMIMR					
		Assess the quality of Giemsa stain in Ghana	NMCP, RDD					
		Monitor prevalence of HRP2 gene deletion in Ghana through sentinel sites	NMCP, NMIMR					
		Conduct molecular monitoring for plasmodium vivax in Ghana	NMCP, NMIMR					
		Assess impact of different behaviour change communication approaches in Ghana	NMCP, NMIMR					
		Disseminate finding of malaria research at national and international meetings	NMCP					
		Supervision - Technical						
		Conduct public monitoring and supervisory visits - National level visiting regional	NMCP					
		Conduct public monitoring and supervisory visits - Regional visiting district	RDHS					
		Conduct public supervisory visits - District visiting sub-district	DDHS					
		Undertake monitoring and supervisory visit to private health facilities	NMCP, RDHS, DDHS					

		Undertake monitoring and supervisory visit to private pharmacies	NMCP, Pharmacy Council, RHMT,DHMT					
		Supervision – Laboratory						
		Public supervisory visits - National visiting regional	NMCP, ICD/GHS					
		Public supervisory visits - Regional visiting district	RDHS					
		Undertake monitoring and supervisory visit to private health facilities	NMCP, ICD/GHS, RDHS					
		Supervision – Financial						
		Public supervisory visits - National visiting regional	NMCP					
		Public supervisory visits - Regional visiting district	RDHS					
	Support population based surveys (DHS, MICS, MIS, local surveys)	Conduct population surveys (GDHS, MICS, MIS etc.)	GSS, NMCP					
	Conduct mid- and end-term reviews	NMCP performance mid-term evaluation	NMCP					
		NMSP 5-year final evaluation	NMCP					
		Develop new malaria strategic and M&E plan						
	Dissemination of survey and surveillance reports	Develop and produce quarterly bulletin	NMCP					
		Produce and print half-year and annual report	NMCP					
		Conduct mid-year and annual performance review including sharing of best practices	NMCP					
		Disseminate copies of bulletin, half-year and annual reports to GHS website	NMCP					

	Enhanced coordinated monitoring of programme progress towards malaria elimination	Conduct partners coordination meeting at district and regional level (quarterly)	RDHS, DDHS, NMCP					
		Conduct SM&E Technical Working Group meetings at national level (Bi-annual)	NMCP					
		Develop annual work plan	NMCP					

5.2 Budget and resource mobilisation plan

5.2.1 Budget summary of the five-year NMSP

5.2.1.1 Costing Methodology

The NMSP (2021-2025) was costed using an activity-based costing approach. The methodology involved identifying and costing the quantities required for programme commodities and activities, and then applying unit costs based on policy documents and historical expenses. Commodity prices are based on global reference prices. The budgets are adjusted for annual inflation using the Bank of Ghana medium-term target rate and converted to U.S. dollars (USD) using a 200-day exponential moving average at 20 February 2020.

6.4.1.1 Summary Budgets for NMSP 2021-2025

Table 5.10: Costing summary by NMSP 2021-2025 objective

Objectives	Strategies	2021 USD	2022 USD	2023 USD	2024 USD	2025 USD	Total USD
Objective 1: Protect at least 80% of the population at risk with effective malaria prevention interventions by 2025	1.1. ITN distribution through mass campaign	79 267 158	-	-	99 853 790	-	**179 120 948**
	1.2. Continuous distribution of LLIN	10 074 023	10 879 945	11 750 341	12 690 368	13 705 598	**59 100 276**
	1.3. IRS	24 356 859	26 305 408	28 516 017	30 682 628	33 137 238	**142 998 149**
	1.4. Alternative methods of protection from the vector	4 070 889	4 090 724	4 723 818	4 771 420	5 483 437	**23 140 288**
	1.5. Other vector control interventions - MIP	6 278 380	4 124 810	7 301 266	4 836 375	8 531 938	**31 072 768**

Objectives	Strategies	2021 USD	2022 USD	2023 USD	2024 USD	2025 USD	Total USD
	1.6. Other vector control interventions - seasonal malaria chemoprevention	14 435 271	15 590 092	16 837 300	18 184 284	19 639 026	**84 685 972**
Objective 2: Provide appropriate diagnosis to all suspected malaria cases and prompt and effective treatment to 100% of confirmed malaria cases in accordance to treatment guidelines by 2025	2.1. Provide quality malaria diagnosis at all levels of care (including quasi-governmental facilities)	22 635 428	12 414 362	19 759 255	21 610 526	23 047 196	**99 466 767**
	2.3. Strengthen capacity building for malaria case management at health training institutions (Pre-service)	247 772	267 594	289 001	312 121	337 091	**1 453 579**
	2.4. Build capacity and improve access to diagnosis and treatment in the private sector	2 392 115	759 569	2 790 163	885 961	3 254 446	**10 082 253**
	2.5. Strengthen quality management for severe malaria case management at all levels	3 200 012	3 456 013	3 732 494	4 031 094	4 353 581	**18 773 195**
	2.7. Improve availability of guidelines, protocols, job aids and enforce adherence to guidelines at all levels	330 499	286 896	385 494	334 636	449 641	**1 787 166**
	2.8. Provide prompt and effective treatment at all levels of care (including quasi-governmental facilities)	9 858 692	10 647 387	11 499 178	12 419 112	13 412 641	**57 837 011**
Objective 3: Ensure timely and adequate supply of quality-assured	3.1. Ensure accurate and timely forecasting and supply planning of malaria commodities	239 583	258 750	279 450	301 806	325 951	**1 405 541**

Objectives	Strategies	2021 USD	2022 USD	2023 USD	2024 USD	2025 USD	Total USD
malaria commodities to all service delivery points by 2025	3.2. Advocate for effective procurement and timely delivery of malaria commodities	31 299	33 803	36 507	39 427	42 582	**183 618**
	3.5. Support full implementation of GhiLMIS for the provision of accurate and timely supply chain information for decision making at all levels	267 490	288 889	312 001	336 961	363 918	**1 569 259**
	3.7. Ensure a proactive governance structure and policy adherence system to promote an effective malaria supply chain	36 703	39 640	42 811	46 236	49 935	**215 325**
Objective 4: Increase awareness and knowledge of the entire population on malaria prevention and control so as to improve uptake and correct use of all interventions by 2025	4.1. Advocacy with stakeholders for commitment to ensure malaria SBCC interventions are prioritised and supported	1 534 213	1 656 950	1 789 506	1 932 666	2 087 279	**9 000 614**
	4.2. Use mass media to engage the public on malaria control interventions.	7 755 046	8 375 450	9 045 486	9 769 125	10 550 655	**45 495 763**
	4.3. Strengthen community action for social mobilisation	5 567 586	6 012 993	6 494 032	7 013 555	7 574 639	**32 662 806**
	4.4. Use social media to engage youths on malaria behaviour change activities	182 976	197 614	213 423	230 497	248 937	**1 073 448**
	4.5. Develop malaria educational materials for SBCC	57 154	61 726	66 664	71 997	77 757	**335 298**

Objectives	Strategies	2021 USD	2022 USD	2023 USD	2024 USD	2025 USD	Total USD
	4.6. Strengthen capacity of health workers and stakeholders in both public and private institutions to effectively engage communities on malaria issues at all levels	452 859	489 087	528 214	570 471	616 109	**2 656 741**
	4.7. Campaign on malaria interventions	12 118 605	13 088 094	14 135 141	15 265 952	16 487 229	**71 095 021**
	4.8. Do coordination and implementation	94 317	101 862	110 011	118 812	128 317	**553 318**
	4.9. Conduct M&E	2 779 873	3 002 263	3 242 444	3 501 839	3 781 986	**16 308 404**
Objective 5: Strengthen and maintain capacity for governance and programme management to achieve programmatic objectives at all levels of the health care system towards malaria control and pre-elimination by 2025	5.1. Enhance political will for malaria control and pre-elimination	5 366	5 795	6 259	6 759	7 300	**31 479**
	5.2. Strengthen coordination and partnerships	7 131 716	7 566 124	8 313 000	8 941 054	9 531 137	**41 483 032**
Objective 6: Strengthen malaria SM&E system to ensure timely availability of high-quality, consistent and relevant malaria data at all levels in order to track the progress of the malaria control and prevention interventions	6.1. Strengthen technical capacity for surveillance of malaria control at all levels	9 166 500	9 899 820	10 691 805	11 547 150	12 470 922	**53 776 196**
	6.2. Strengthen the logistics structure for surveillance at all levels	394 431	168 514	181 995	196 555	512 594	**1 454 090**
	6.3. Improve malaria quality assurance system at all levels	253 954	274 270	296 212	319 909	345 502	**1 489 847**

Objectives	Strategies	2021 USD	2022 USD	2023 USD	2024 USD	2025 USD	Total USD
towards the 2025 malaria control targets	6.4. Establish malaria SM&E system for pharmacies and OTCMS	2 472 006	2 669 767	2 883 348	3 114 016	3 363 137	**14 502 274**
	6.5. Intensify malaria surveillance in the selected districts for pre-elimination	501 416	541 530	584 852	631 640	682 171	**2 941 610**
	6.6. Strengthening surveillance at sentinel sites	626 885	677 036	731 199	789 694	852 870	**3 677 683**
	6.7. Operational research to inform programme direction	2 416 432	1 755 040	2 750 150	2 047 079	3 133 929	**12 102 630**
	6.8. Conduct support supervision	3 308 740	3 573 440	3 859 315	4 168 060	4 501 505	**19 411 059**
	6.9. Support population-based surveys (DHS, MICS, MIS, KAPs)	84 873	91 663	98 996	106 915	115 469	**497 915**
	6.10. Conduct mid- and end-term reviews	489 743	528 923	571 237	616 936	666 290	**2 873 129**
	6.11. Disseminate survey and surveillance reports	64 282	69 425	74 979	80 977	87 455	**377 119**
	6.12. Enhance coordinated monitoring of programme progress towards malaria elimination	41 132	44 423	47 977	51 815	55 960	**241 307**
Total (USD)		**235 222 280**	**150 295 688**	**174 971 341**	**282 430 219**	**204 013 365**	**1 046 932 894**

Table 5.11: Costing summary by interventions

Interventions	2021 USD	2022 USD	2023 USD	2024 USD	2025 USD	Total USD
Vector control - Long-lasting insecticidal nets (LLIN) - Mass campaign	79 267 158	-	-	99 853 790	-	**179 120 948**
Vector control - Long-lasting insecticidal nets (LLIN) - Continuous distribution	10 074 023	10 879 945	11 750 341	12 690 368	13 705 598	**59 100 276**
Vector control - Indoor residual spraying (IRS)	18 362 857	19 831 886	21 524 613	23 131 911	24 982 464	**107 833 732**
Vector control - Entomological monitoring	5 994 002	6 473 522	6 991 404	7 550 716	8 154 773	**35 164 417**
Other vector control measures	4 070 889	4 090 724	4 723 818	4 771 420	5 483 437	**23 140 288**
Specific prevention interventions (SPI) - Intermittent preventive treatment (IPT) - In pregnancy	6 278 380	4 124 810	7 301 266	4 836 375	8 531 938	**31 072 768**
Specific prevention interventions (SPI) - Seasonal malaria chemoprevention (SMC)	14 435 271	15 590 092	16 837 300	18 184 284	19 639 026	**84 685 972**
Case management - Facility-based treatment	38 664 518	27 831 820	38 455 586	39 593 450	44 854 596	**189 399 971**
Procurement supply chain management (PSCM) - Other	575 076	621 082	670 769	724 430	782 385	**3 373 742**
Information, education and communication/behaviour change communication (IEC/BCC)	30 542 628	32 986 038	35 624 921	38 474 915	41 552 908	**179 181 411**
Programme management - Grant management	7 121 651	7 555 253	8 159 674	8 928 375	9 517 443	**41 282 397**
Health information systems and M&E - Other	13 510 547	14 333 920	15 622 220	16 719 084	18 356 925	**78 542 697**
Health information systems and M&E - Routine reporting	3 722 287	4 020 070	4 341 676	4 689 010	5 064 131	**21 837 175**

Health information systems and M&E - Surveys	2 602 992	1 956 524	2 967 753	2 282 090	3 387 741	**13 197 100**
Total	**235 222 280**	**150 295 688**	**174 971 341**	**282 430 219**	**204 013 365**	**1 046 932 894**

Table 5.12: Costing summary by modules

Modules	**2021 USD**	**2022 USD**	**2023 USD**	**2024 USD**	**2025 USD**	**Total USD**
Vector control	117 768 929	41 276 077	44 990 176	147 998 206	52 326 272	**404 359 661**
Specific prevention interventions (SPI) -IPT	6 278 380	4 124 810	7 301 266	4 836 375	8 531 938	**31 072 768**
Specific prevention interventions (SPI)- SMC	14 435 271	15 590 092	16 837 300	18 184 284	19 639 026	**84 685 972**
Case management	38 664 518	27 831 820	38 455 586	39 593 450	44 854 596	**189 399 971**
HSS - Procurement supply chain management (PSCM)	575 076	621 082	670 769	724 430	782 385	**3 373 742**
Specific prevention interventions (SPI) - SBCC	30 542 628	32 986 038	35 624 921	38 474 915	41 552 908	**179 181 411**
Programme management	7 121 651	7 555 253	8 159 674	8 928 375	9 517 443	**41 282 397**
HSS - Health information systems and M&E	19 835 827	20 310 515	22 931 649	23 690 184	26 808 797	**113 576 972**
Total	**235 222 280**	**150 295 688**	**174 971 341**	**282 430 219**	**204 013 365**	**1 046 932 894**

Table 5.13: Cost of health products

Commodities	2021 USD	2022 USD	2023 USD	2024 USD	2025 USD	Total USD
ACT doses	2 731 625	2 764 131	2 797 024	2 830 309	2 863 990	**13 987 080**
RDT units	3 155 463	3 418 082	3 702 461	3 990 143	4 300 177	**18 566 326**
LLIN units	52 208 214	9 463 969	9 611 380	56 916 894	10 352 768	**138 553 225**
IPTp doses (SP)	1 113 826	1 199 177	1 288 099	1 380 718	1 477 163	**6 458 984**
Artesunate inj. doses	2 914 222	2 948 901	2 983 993	3 019 503	3 055 435	**14 922 055**
Artesunate supp. doses	21 116	21 368	21 622	21 879	22 140	**108 125**
Amodiaquine plus Sulphadoxine-Pyrimethamine doses (AQ+SP)	1 265 753	1 297 397	1 329 832	1 363 077	1 397 154	**6 653 213**
Insecticides	9 257 493	9 998 092	10 797 939	11 661 775	12 594 717	**54 310 015**
Total	**72 667 713**	**31 111 117**	**32 532 352**	**81 184 298**	**36 063 543**	**253 559 023**

Budget Summary Graphs

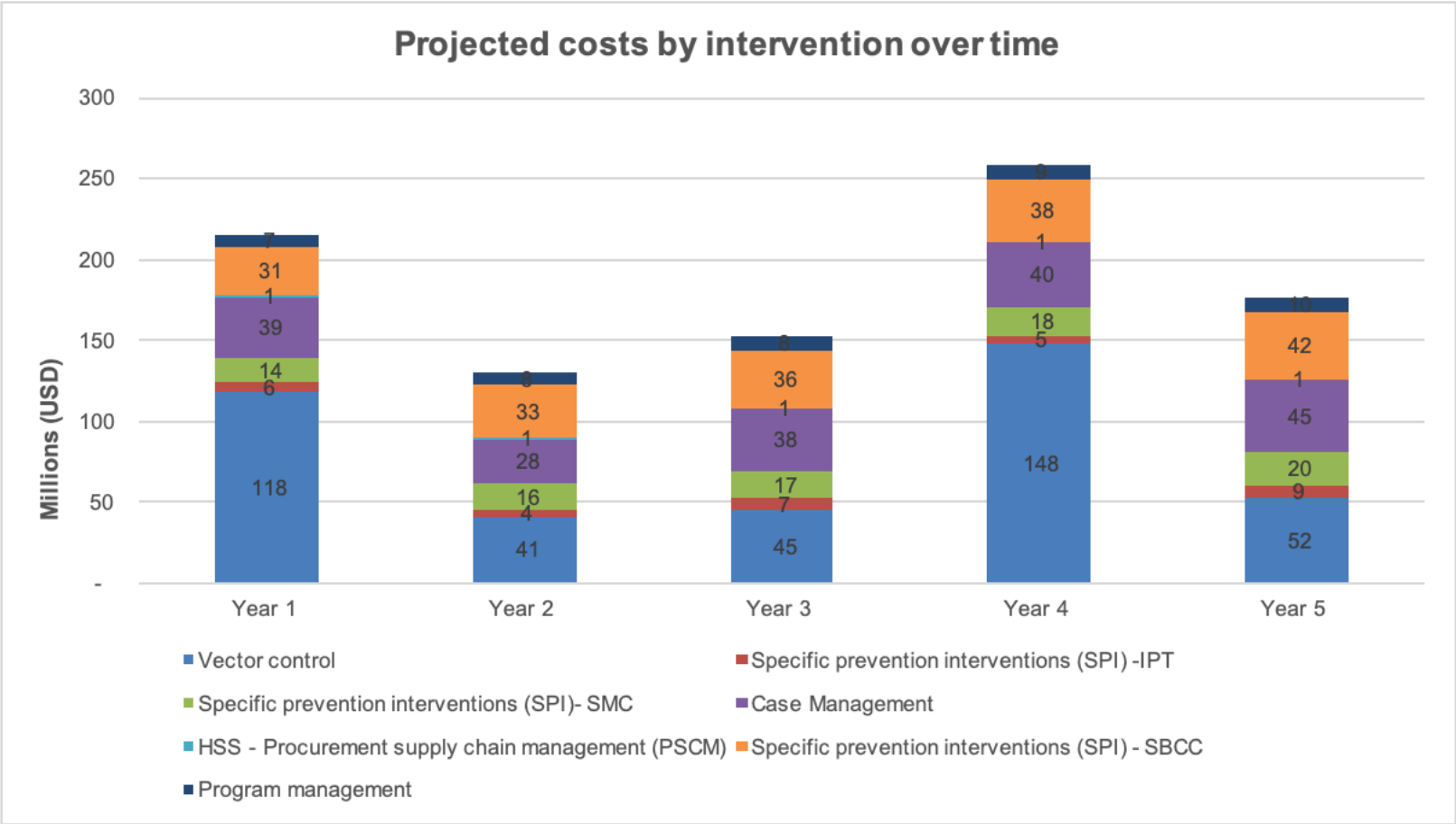


Figure 5.1: Projected costs by intervention, NMSP 2021-2025

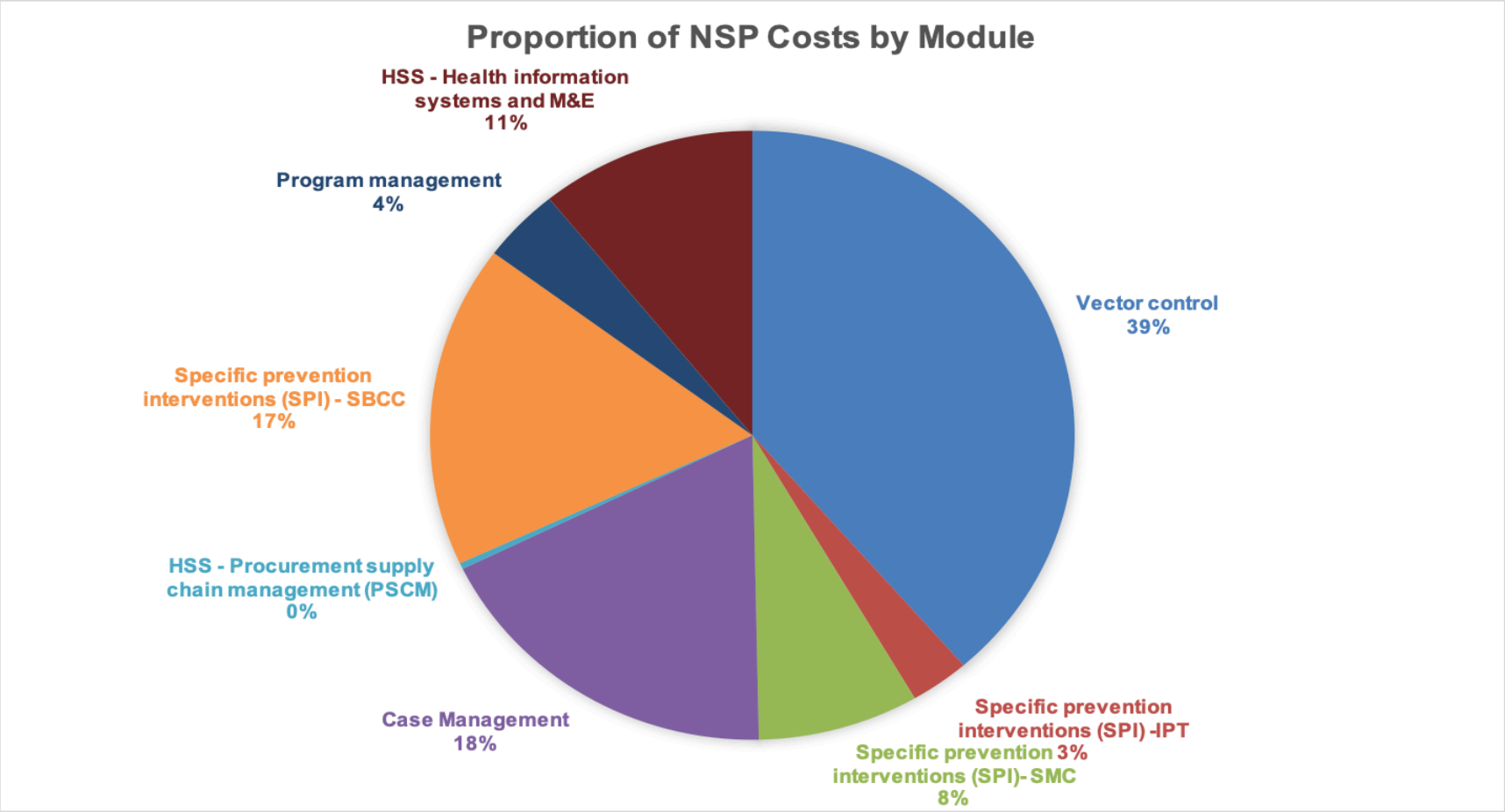


Figure 5.2: Proportion of NMSP 2021-2025 costs by module

5.2.2 Summary Gap Analysis

Strategies for resource mobilisation aimed at filling these gaps during the lifespan of the NMSP 2021-2025, has been described under the co-financing component of Objective 6: Improve mobilisation of resources and maximise the efficient use of available resources for greater public health impact by 2025.

Table 5.14: NMSP gap analysis needs

Resources	2021	2022	2023	2024	2025	Total
A. Total national strategic plan budget	235,222,280.58	150,295,687.90	174,971,340.73	282,430,219.36	204,013,365.38	1,046,932,893.95
B. Current and expected domestic resources	10,222,232.93	12,471,124.18	15,214,771.51	18,562,021.24	22,645,665.92	79,115,815.78
C. Current and expected external resources	23,305,800.00	23,533,858.00	23,764,196.58	24,001,838.55	24,241,856.93	118,847,550.06
D. Total current and planned resources (B+C)	33,528,032.93	36,004,982.18	38,978,968.09	42,563,859.79	46,887,522.85	197,963,365.84
E. Financial gap = A–D	**201,694,247.65**	**114,290,705.72**	**135,992,372.64**	**239,866,359.57**	**157,125,842.53**	**848,969,528.11**

6. MONITORING AND EVALUATION FRAMEWORK OF THE NMSP

The M&E framework consists of the following: performance framework; data management system; and M&E coordination mechanisms.

6.1 Performance framework

Table 6.1: Performance Framework for National Malaria Strategic Plan 2021-2025

INDICATORS		BASELINE			TARGETS				
		Data	Year	Sources	2021	2022	2023	2024	2025
IMPACT INDICATORS									
	Goal :								
Goal 1: Reduce the malaria mortality to near zero by the year 2025 (using 2019 as baseline)									
1	Inpatient malaria deaths per 100,000 persons per year	1.1	2019	HMIS	0.72	0.56	0.39	0.23	0.06
2	Number of malaria reported deaths	333	2019	HMIS	240	189	136	81	22
3	Children under 5 case fatality	0.12	2019	HMIS	0.08	0.06	0.04	0.02	0.01
Goal 2: Reduce malaria case incidence by 70% by 2025 compared with 2019 baseline									

INDICATORS		BASELINE			TARGETS				
		Data	Year	Sources	2021	2022	2023	2024	2025
1	Parasitaemia prevalence: children aged 6–59 months with malaria infection (by microscopy) (percentage)	14.10%	2019	MIS (Malaria Indicator Survey)	10.8		7.5		4.3
2	Malaria test positivity rate	22.40%	2019	HMIS	16.4	13.4	10.4	7.4	4.4
3	Confirmed malaria cases (microscopy and RDT) per 1000 population per year	192	2019	HMIS	210	219	228	219	210
4	Number of confirmed outpatient malaria cases	6,104,713	2019	HMIS	5,370,331	4,999,607	4,869,329	4,199,837	4,072,138
Goal 3: Achieve malaria pre-elimination in at least 6 districts by 2025:									
1	SPR from routine HMIS	8.0%	2019	DHIMS					
2	Annual parasite index (number of positive slides per 1000 population at risk)	5.6	2019						
OUTCOME AND OUTPUT INDICATORS									
Objective 1: To protect at least 90% of the population with effective malaria prevention interventions by 2025									
1	Percentage of households with at least one insecticide-treated net (ITN)	73.7%	2019	MIS (Malaria	79.1		84.6		90.0

INDICATORS		BASELINE			TARGETS				
		Data	Year	Sources	2021	2022	2023	2024	2025
				Indicator Survey)					
2	Percentage of households with at least one ITN for every two people	51.4%	2019	MIS (Malaria Indicator Survey)	62.60		73.80		85.00
3	Percentage of de facto household population who could sleep under an ITN if each ITN in the household were used by up to two people (Access)	66.7%	2019	MIS (Malaria Indicator Survey)	72.8		78.9		85.0
4	Percentage of children under 5 years old who slept under an ITN the previous night	54.1%	2019	MIS (Malaria Indicator Survey)	64.4		74.7		85.0
5	Percentage of pregnant women who slept under an ITN the previous night	48.7%	2019	MIS (Malaria Indicator Survey)	60.8		72.9		85.0
6	Percentage of individuals who slept under an ITN the previous night amongst households possessing at least one ITN	54		MIS (Malaria Indicator Survey)	62.7		71.3		80.0

INDICATORS		BASELINE			TARGETS				
		Data	Year	Sources	2021	2022	2023	2024	2025
7	ITN Use-Access Ratio	64.5		MIS (Malaria Indicator Survey)	69.6		74.8		80.0
8	Number of long-lasting insecticide-treated nets (LLNs) distributed to delivery points health facilities, schools (Routine)	2,847,862	2019	School Health report and DHIMs 2/Campaign report	2,274,551	3,562,762	3,646,318	2,266,225	3,827,187
9	Percentage of population in target areas sprayed with indoor residual spraying (IRS) in the last 12 months	91%	2019	Administrative Records	90%	90%	90%	90%	90%
10	Number of targeted districts implementing IRS	100% (24/24)	2019	Administrative Records	100% (43/43)	100% (43/43)	100% (43/43)	100% (43/43)	100% (43/43)
11	Number of targeted districts which received appropriate larvae source management	na	2019	Situation Analysis	105	105	105	105	105
12	Percentage of pregnant women who received 3 doses of intermittent preventive treatment	61	2019	MIS (Malaria	65.5		70.0		74.5

INDICATORS		BASELINE			TARGETS				
		Data	Year	Sources	2021	2022	2023	2024	2025
	(IPT) for malaria during ANC visits during their last pregnancy			Indicator Survey)					
13	Percentage (%) of pregnant women on IPT (at least three doses of SP) according to national policy	48.2	2019	HMIS	58.8	64.1	69.4	74.7	80.0
14	Proportion of children aged 3-59 months treated under SMC	99	2019	SiCapp	95	95	95	95	95
Objective 2: Provide appropriate diagnosis to all suspected malaria cases and prompt and effective treatment to 100% of confirmed malaria cases in accordance to treatment guidelines by 2025									
1	Percentage of children under 5 years old with fever in the last 2 weeks who received anti-malarial treatment according to national policy within 24 hours of the onset of fever	85%	2019	MICS (Multiple Indicator Cluster Survey)	94.7	99.8	100	100	100
2	Percentage of suspected malaria cases that received a parasitological test (RDTs or microscopy)	93.7	2019	HMIS	97.65	99.63	100.00	100.00	100.00
3	Percentage of uncomplicated malaria cases (clinical) treated with ACT at health facilities.	11.8	2019	HMIS	5.30	2.05	1.00	0	0

INDICATORS		BASELINE			TARGETS				
		Data	Year	Sources	2021	2022	2023	2024	2025
4	Number and percentage of uncomplicated malaria cases (tested positive) treated with ACT at health facilities.	96%	2019	HMIS	100%	100%	100%	100%	100%
Objective 3: Increase awareness and knowledge of the entire population on malaria prevention and control so as to improve uptake and correct use of all interventions by 2025									
1	Number of regional and district health promotion officers, malaria focal person and CHOs trained on interpersonal communication, social marketing and community engagement.	na	2019	Report	2514		2514		2514
2	Number of SBCC materials produced (posters, short clips, social media content, billboards, flyers, CDs, jingles, songs)	na	2019	Report	10021		10021		10021
3	Number of door-to-door education visits on malaria conducted by CHOs and volunteers	na	2019	Report	500000		500000		500000
Objective 4: Strengthen and maintain capacity for governance and programme management to achieve programmatic objectives at all levels of the health care system towards malaria control and pre-elimination by 2025									
1	Advocate and engage the select committee on health for inclusion	2	2019	Report	2	2	2	2	2

INDICATORS		BASELINE			TARGETS				
		Data	Year	Sources	2021	2022	2023	2024	2025
	of malaria programme as a priority on their agenda to increase political buy-in								
2	Engage CSOs in garnering political support for malaria elimination in Ghana	2	2019	Report	2	2	2	2	2
3	Conduct national and sub-national malaria reviews	2	2019	Report	2	2	2	2	2
4	Conduct periodic review of malaria NSP	1	2017	Report	0	0	1	0	1
Objective 5: Ensure timely and adequate supply of quality-assured malaria commodities to all service delivery points by 2025									
1	Number of reviews on forecasting and quantification data conducted	1	2019	Report	1		1		1
2	Number of supply chain operators trained at all levels	na	2019	Report	280		280		280
3	Number of monitoring and supervision undertaken to service delivery points to check on availability of malaria commodities including non-consumable malaria logistics.	2	2019	Report	2		2		2

INDICATORS	BASELINE			TARGETS				
	Data	Year	Sources	2021	2022	2023	2024	2025
Objective 6: Financial and resource mobilisation: Implementation, monitoring and evaluation								
Implementation of the NMCP Financing Strategy requires coordination and engagement across stakeholders. An implementation plan for the finance strategy will be developed to track progress against targets and timelines. The implementation plan will be reviewed and updated on a regular basis to maximise responsiveness and progress. A Malaria Financing Steering Committee will be created to provide oversight during implementation and to oversee M&E of the process. The Malaria Financing Steering Committee will monitor performance indicators that measure the achievement of financing strategy goals and objectives. An institutionalised mechanism for data collection of key performance indicators will need to be created. The NMCP will work towards integration of simple, practical key performance indicators to regularly collect and report on metrics using a standard methodology. Whenever possible, existing indicators will be used. The metrics will inform decision making and will help measure progress towards NMCP goals. An M&E Plan will be created to define indicators, baselines, targets, frequency of collection and data collection methodology. An illustrative list of performance indicators is provided in Table 6.2.								

Table 6.2: Illustrative performance indicators

Strategy	Indicators
Increase government spending and improve efficiency of government resource allocation for malaria programming.	• Government malaria spending as % of total government spending. • Government malaria spending as % of malaria budget request.
Align donor funding with GHS/NMCP strategies, plans and priorities and strengthen coordination of donor funding for malaria.	• % of donor support that aligns to the NMSP. • % of donors that provide medium term (3 to 5 years) anticipated funding estimates.
Enhance planning for results, resource mobilisation and financial sustainability of malaria programmes.	• Funding received as a % of funding needs identified in the costed malaria annual work plans. • Private sector malaria funding as a % of total malaria funding.

Objective 7: Strengthen malaria SM&E towards the 2025 malaria control targets								
Percentage of health facilities submitting timely reports according to national guidelines	92.6	2019	HMIS	95	95	95	95	95
Percentage of health facilities submitting complete reports according to national guidelines	97.5	2019	HMIS	100	100	100	100	100

6.2 Data Management System and Flow

Data are generated from service delivery sites and recorded in standard registers from various units. Summaries of all data collected are verified by In-charges, documented and entered into DHIMS through use of respective reporting forms. Facilities validate their data before entry into DHIMS. Facilities without access to computers submit their verified data to the sub-district for verification and data entry. With the exception of facilities within areas targeted for pre-elimination, which are reporting weekly, all facilities and districts enter data monthly. Districts are to collate quarterly activity reports of sub-districts/facilities and submit to regions. Regions collate quarterly activity reports from districts and submit to programmes and at the national level. Regional hospitals and some specialized health facilities perform day-to-day duties without the direct oversight of the District Health Directorates in which they are located. These reports are transmitted manually or electronically through the region to the national level.

Data generated from private sector work at points of service delivery will be recorded and reported through the community health information system into DHIMS using fit-for-purpose recording and reporting tools designed for the private sector.

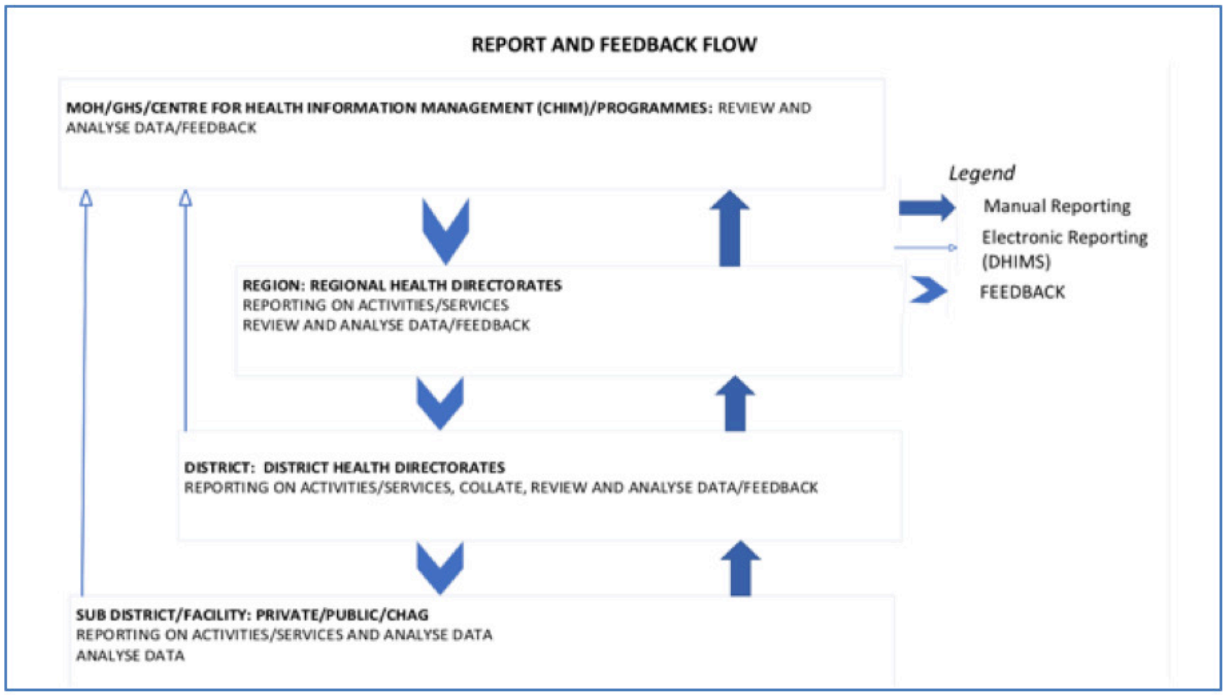


Figure 6.1: Report and feedback flow

6.2.1 Data quality assurance

There are standard operating procedure to ensure standardisation of the data collection, reporting and validation. Staff at all levels will continue to be trained in the use of DHIMS2 for data collection, collation, analysis and reporting. Maintaining and improving data quality assurance of surveillance data is expected to result from conducting routinely scheduled data quality audits, supportive supervision, and data management training at all levels. The institution of automated data quality checks at all levels will also help to ensure the quality of data in DHIMS. The NMCP will support periodic data validation assessment of DHIMS2.

The GSS and partners will implement standardized periodic surveys such as the Ghana DHS, MICS and MIS. Therefore, planning, implementation, monitoring and oversight will include adherence to validated surveillance methodologies and data quality-assurance standards. Likewise, donor-funded research and surveillance sites (the Global Fund/NMCP drug efficacy and epidemiological sentinel surveillance sites, and the Anglogold Ashanti Malaria programme (AGAMal) and PMI entomological surveillance sites) will adhere to validated surveillance methodologies and data quality-assurance standards.

Research and academic institutions are regulated by their respective Institutional Review Boards, which require adherence to validated data quality assurance standards.

6.2.2 Data warehousing and processing

The DHIMS2 system has the capability for data capture, data cleaning, data security, data storage and generating customised reports based on inbuilt reporting formats. At the district, regional and national level, data on malaria will be analyzed to generate reports on indicators, which are important for monitoring trends and evaluation of the program. At the district level, this is done as part of an integrated monitoring and evaluation framework.

In addition, the Malaria Integrated Dashboard will provide additional standard analysis format for monitoring and evaluating key indicators across interventions. These analyses are used to generate annual and half-year reports of district performance. For areas targeted for pre-elimination, weekly analysis will be undertaken to respond to unusual trends and outbreaks.

6.3 Dissemination and use of information products

The annual regional and district reviews will provide a platform for dissemination of performance indicators to various stakeholders. Mid-year and annual review meetings and reports will be coordinated by the NMCP, through which information on the malaria situation will be shared with all stakeholders. All the standard reports and bulletins will be available on the website for wider stakeholders. Media briefing and dissemination fora for surveys and special research will be used. Key performance information from surveys, operational research and routine surveillance will be disseminated through dissemination meetings, performance reviews and commemoration of World Malaria Day.

6.4 Malaria M&E coordination mechanisms

Joint planning, supervision and M&E processes will form the basis for promoting partnership coordination. Information regarding programme management, epidemiological and entomological data, and IRS operations will be shared with funding agencies, and implementing partners at all levels. This will enhance data exchange and information flow, and promote the sharing and discussion of critical performance indicators to help advance and improve the national program. Quarterly progress reports will be submitted by all implementing agencies to the NMCP.

The implementers will also adhere to all M&E guidelines provided by the programme and the Malaria Monitoring and Evaluation Technical Working Group. In addition, programme implementers may also be required to respond to specific information requests from the technical working group. These requests might include:

- Baseline reports from entomological and/or epidemiological surveys conducted prior to implementation of an intervention within the country
- Surveys and operational research within the context of their activities

The group is a multi-stakeholder initiative bringing together the expertise of representatives of government, private sector, business and civil society in an effort to find solutions to complex issues and identify new and improved solutions to advance policy direction. It will collaborate with all sub-committees under the NMCP to ensure the full implementation of the M&E plan.

BIBLIOGRAPHY

1. Malaria Programme Review Report, 2019
2. Malaria Information System Report, 2016
3. Malaria Programme Review Report, 2019
4. Multiple Indicator Cluster Survey Report, 2011
5. Malaria Indicator Survey Report, 2016
6. Ghana Statistical Service, Population and Housing Census, 2010
7. Ghana Demographic and Health Survey, 2014
8. [http://worldpopulationreview.com/ countries/ghana-population/]
9. (www.tradingeconomics.com/ghana/gdp)
10. Ministry of Health, (MoH) Holistic Assessment 2018
11. Malaria Programme Review Report, 2019
12. Multiple Cluster Indicator Survey, 2011
13. Malaria Indicator Survey report, 2019
14. Malaria Programme Review Report, 2019
15. Malaria Programme Review Report, 2019
16. Coleman, S., Dadzie, S.K., Seyoum, A. et al. A reduction in malaria transmission intensity in Northern Ghana after 7 years of indoor residual spraying. Malar J 16, 324 (2017). https://doi.org/10.1186/s12936 017-1971-0
17. Presidential Malaria Initiative (PMI) report 2018, Feeding and Resting Behaviour of malaria vectors, 2016-2017
18. University of Oxford's Malaria Atlas Project (https://map.ox.ac.uk)
19. Malaria Performance Review report, 2019
20. Malaria Performance Review report, 2019
21. Malaria Performance Review 2019
22. World Health Organisation and Roll Back Malaria Partnership to End Malaria, HBHI Report, 2019
23. Bhatt, et al, 2015 Bhatt, S., Weiss, D., Cameron, E. et al. The effect of malaria control on Plasmodium falciparum in Africa between 2000 and 2015. Nature 526, 207–211 (2015). https://doi.org/10.1038 nature15535

ANNEXES

2021 - 2025
MALARIA STRATEGIC PLAN

NATIONAL MALARIA
CONTROL PROGRAMME

GHANA HEALTH SERVICE