**THE UNITED REPUBLIC OF TANZANIA**

MINISTRY OF HEALTH

# MALARIA SURVEILLANCE, MONITORING AND EVALUATION PLAN

## 2021 – 2025

**National Malaria Control Programme**

July 2022

# TABLE OF CONTENTS

## LIST OF FIGURES



## LIST OF TABLES

# ACRONYMS

| | | | |
|---|---|---|---|
| ACTs | Artemisinin based Combination Therapy | MOH | Ministry Of Health |
| ADDO | Accredited Drug Dispensing Outlet | MPR | Malaria Program Review |
| ADR | Adverse Drug Reaction | mRDT | Malaria Rapid Diagnostic Test |
| AIDS | Acquired Immuno Deficiency Syndrome | MSAT | Mass Screening and Testing |
| ANC | Ante-Natal Clinic | MSDQI | Malaria Services and Data Quality Improvement |
| API | Annual Parasite Incidence | MTR | Mid Term Review |
| ASTMH | American Society of Tropical Medicine and Hygiene | MUHAS | Muhimbili University of Health and Allied Sciences |
| BEMIS | Basic Education Management Information System | MVCIM | Malaria Vector Control Interventions Monitoring |
| BEST | Basic Education Management Information System | MVCIS | Malaria Vector Control Information Syste |
| CFR | Case Fatality Rate | MVS | Malaria Vector Surveillance |
| CHMT | Council Health Management Team | NBS | National Bureau of Statistics |
| CMM | Community Malaria Monitoring | NGMDT&PT | National Guideline for Malaria Diagnosis, Treatment and Preventive Therapy |
| CUHAS | Catholic University of Health and Allied Sciences | NIMR | National Institute for Medical Research |
| DHIS2 | District Health Information System version 2 | NMCP | National Malaria Control Program |
| DHO | District Health Officer | NMSP | National Malaria Strategic Plan |
| DHS | Demographic Health Survey | NPC | National Population Census |
| DMQA | Diagnostics and Medicine Quality Assurance | NSP | National Strategic Plan |
| DOIS | Drug Outlets Information System | OPD | Outpatient Department |
| DQA | Data Quality Assurance | Pfpr | Plasmodium Falciparum Prevalence Rate |
| DRS | Data Repository System | PMI | President's Malaria Initiative |
| DSS | Demographic Surveillance System | PORALG | President's Office Regional Administration and Local Government |
| ECTMIH | European Congress on Tropical Medicine and International Health | PQ | Primaquine |
| EDP | | PSI | |
| eIDSR | Electronic Integrated Disease Surveillance and Response | PSS | Pharmaceutical Services Section |
| EIR | Entomological Inoculation Rate | QA/QC | Quality Assurance/ Quality Control |
| eLMIS | Electronic Logistic Management Information System | RBM | Roll Back Malaria |
| EUV | End User Verification | RCH | Reproductive and Child Health |
| G | Generation | RDTs | Rapid Diagnostic Test |
| GFATM | Global Fund to Fight AIDS, Tuberculosis and Malaria | RHMT | Regional Health Management Team |
| GTS | Global Technical Strategy | RHS | Regional Health Secretary |
| HBHI | High Burden High Impact | RMIFP | Regional Malaria and IMCI Focal Person |
| HBS | Household Budget Survey | RMO | Regional Medical Officer |
| HDSS | | RTS,S | Malaria vaccine |

| | | | |
|---|---|---|---|
| HMIS | Health Management Information System | SARA | Service Availability and Readiness Assessment |
| hrpt2/3 | Histidine rich protein 2 and 3 | SAVVY | Sample Vital Events Registration with Verbal Autopsy |
| iCCM | Integrated Community Case Management | SBCA | Social Behaviour Change and Advocacy |
| ICT | Information Communication and Technology | SMC | Seasonal Malaria Chemotherapy |
| IDSR | Integrated Disease Surveillance and Response | SME | Surveillance, Monitoring and Evaluation |
| IHI | Ifakara Health Institute | SMPS | School Malaria Parasitological Survey |
| ILS | Integrated Logistic Management | SNP | School Net Program |
| IPD | Inpatient Department | SOP | Standard Operating Procedure |
| IPTi | Intermittent Preventive Treatment for Infants | SP | Sulfadoxine Pyrimethamine |
| IPTp | Intermittent Preventive Treatment in Pregnancy Intermittent Preventive Treatment in Pregnancy | SPA | Service Provision Assessment |
| IPTp2 | Intermittent Preventive Treatment in Pregnancy – second dose | SPR | Slide Positivity Rate |
| IPTsc | Intermittent Preventive Treatment in School children | SPS | Sentinel Population Surveillance |
| IRI | International Research Institute | TDHS | Tanzania Demographic Health Survey |
| IRT | Insecticide Resistance Testing | TES | Therapeutic Efficacy Studies |
| ITN | Insecticide Treated Nets | THBS | |
| JSI | | TMA | Tanzania Meteorological Agency |
| KCMC | Kilimanjaro Christian Medical Centre | TMDA | Tanzania Medicines and Medical Devices Authority |
| KEMRI | Kenya Medical Research Institute | TMIS | Tanzania Malaria Indicator Survey |
| LLIN | Long Lasting Insecticide Treated Nets | TNVsi | Tanzania National Voucher Scheme - infants |
| LMU | Logistics Management Unit | TNVsp | Tanzania National Voucher Scheme – pregnant women |
| LSM | Larval Source Management | TPR | Test Positivity Rate |
| M&E | Monitoring and Evaluation | TPRI | Tropical Pesticides Research Institute |
| mCBS | Malaria Case Based Surveillance | TSPA | Tanzania Service Provision Assessment |
| MDA | Mass Drug Administration | USAID | United States of America International Development Agency |
| MEEDS | Malaria Epidemic Early Detection System | V2 | |
| MEEWS | Malaria Epidemic Early Warning System | WEHO | Ward Environmental Health Officer |
| MIM | Meteorological Information Monitoring | WEO | Ward Executive Officer |
| MIS | Malaria Indicator Survey | WHO | World Health Organization |

# FOREWORD

The Surveillance, Monitoring and Evaluation (SME) plan has been developed in line with the current National Malaria Strategic Plan (NMSP), which outlines key technical and supportive strategies in the fight against malaria for the period 2021 – 2025.

This SME plan is a product of extensive consultations and collaboration between all stakeholders and established strategic framework for the collection, transmission, analysis, interpretation, dissemination and ultimately, use of information for optimizing malaria control interventions.

This plan forms an ideal platform to measure the performances and evaluating achievements of the NMSP (2021 – 2025) targets. The plan describes a comprehensive SME platform with its goal and objectives (chapter 1), core malaria indicators and the available information system in place to collect them (chapter 2), the data management framework (chapter 3) and the implementation arrangements (chapter 4).

It is also part of the implementation of the principle of the “Three Ones”; one Strategic Plan, one Coordinating Mechanism and one Surveillance, Monitoring and Evaluation plan for malaria control including costed work plan, agreed by Malaria Control Programme and its partners in effective monitoring of performance and outcomes.

I am confident that this plan provides the necessary framework for monitoring and evaluation of malaria control interventions and I urge all stakeholders to work as a team in its implementation to enable the country move towards the vision of a “MALARIA-FREE TANZANIA”.

Prof. Tumaini J. Nagu
**CHIEF MEDICAL OFFICER**

# ACKNOWLEDGEMENT

The Ministry of Health wishes to express its sincere and deep appreciation to various partners, stakeholders and individuals who contributed to the development of this Surveillance, Monitoring and Evaluation (SME) Plan. On behalf of the Ministry, I would like to acknowledge the contribution of various departments of the Ministry of Health led by the National Malaria Control Programme.

I am also extending my appreciation to development partners, specifically to the United States Agency for International Development (USAID), Swiss Agency for Development & Cooperation through Swiss TPH, and the World Health Organization (WHO), for their Technical support.

I would like to extend my gratitude to the Global Fund to Fight AIDS, Tuberculosis and Malaria (GFATM) and the President's Malaria Initiative (PMI) for the financial support rendered to the Government of Tanzania during development of this SME plan.

Last but not least, since it is not easy to mention everyone, on behalf of the Ministry, I would like to acknowledge the work of every individual who in one way or another contributed to the development of this plan.

Dr. Beatrice Mutayoba
**DIRECTOR OF PREVENTIVE SERVICES**

# EXECUTIVE SUMMARY

The Malaria Surveillance, Monitoring and Evaluation plan for the period 2021-2025 is based on and complements the National Malaria Strategic Plan (NMSP) 2021-2025. Tanzania's progress in malaria control is shifting the epidemiology of malaria from control phase towards sustained control and, eventually, to pre-elimination. As Tanzania moves towards new phases of control, it becomes increasingly imperative that cases are properly reported and followed-up and that programmatic and service provision indicators are continuously collected. This enables NMCP to assess its progress towards International and National targets, and to ensure resources are being used in the most cost-effective manner. The SME plan focuses on NMCP's strategy to move towards (a) passive surveillance through health facilities, (b) proactive, regular monitoring of parasite prevalence, vector distribution, and interventions coverage and (c) active surveillance through follow up of passively detected cases in areas with very low malaria transmission risk. The planned SME activities will contribute to an improved understanding of the malaria burden carried by specific geographies and communities within Tanzania and push the country forwards towards elimination.

The overarching objective of SME activities for the next five years includes:

- To provide timely and reliable information to assess progress towards the set global and national targets,
- To ensure resources are used in the most cost-effective manner, and
- To account for investments made in malaria control

The objectives of the National Malaria Strategic Plan will be supported by extensive routine and periodic SME systems and surveys with various processes and tools used for data management and analysis. The tools that have been used in the past - basic health facilities indicators and national representative surveys - have been both cost-effective and efficient in capturing useful data but may not provide a clear picture of the gains made in malaria in the near future. Three major impact and four major outcome indicators have been identified as the core national indicators to evaluate the progress towards the achievements of the 2021-2025 National Malaria Strategic Plan. These indicators are collected through National and Regional representative surveys and include four key sources of information based on population, health facility, malaria vector, and programmatic level. Assessment of intervention coverage and impact is a fundamental element for monitoring disease trends. Health facility-based surveillance indicators are able to capture key coverage and impact indicators up to Council and sub-Council level.

Due to the complex malaria transmission framework, there is a wide variety of SME systems and tools in place to collect data for monitoring malaria transmission and malaria control interventions across Tanzania. These multiple systems reflect the interaction between the different elements of malaria transmission: vector, parasite, host, environment and, eventually, malaria control interventions. The comprehensive malaria surveillance framework includes four major elements. Each element of the

surveillance framework is strongly linked with a response system and will generate an alert if an abnormal situation or rupture of equilibrium occurs.

- Malaria disease surveillance including passive monthly HMIS and weekly eIDSR reporting and active case detection, if applicable.
- Malaria control programmatic surveillance including malaria commodities logistic management reporting, preventive initiatives reporting and, parasite and vector resistance monitoring.
- Malaria transmission surveillance: including Sentinel population surveillance, malaria vector surveillance and climate monitoring.
- Malaria quality services surveillance including malaria service and data quality improvement and health products QA/QC.

All data that originates from one of the above systems or surveys is submitted to a more senior level for approval. Data can originate from a variety of levels, including Health facilities, Malaria Focal Persons, and Regional or National representatives and institutions. The preferential flow of information from health facilities is via DHIS2. Ideally, once reviewed, data should be sent to the SME unit of the NMCP and, eventually, entered into a comprehensive composite Malaria Database. The NMCP SME unit will aggregate the data and produce reports and publications for dissemination and utilization at various levels, such as the Ministry of Health, CHMTs and RHMTs, other Ministries, Government Departments, Development partners, Implementing Partners, Research Institutions and Community at large.

In order to manage the massive input of information appropriately, it is of paramount importance to set up a centralized Data Repository System (DRS) that is able to store records from different systems, organize them and provide standardized outputs for easy interpretations. The DRS should be flexible and provide a platform for analysis of data at different administrative and functional levels. This framework of a planned surveillance, monitoring, and evaluation activities will contribute to an improved understanding of the malaria burden carried by specific geographies and communities within Tanzania.

# CHAPTER 1: INTRODUCTION

## 1.1 Background

Malaria is one of the major public health threats in Mainland Tanzania and is transmitted in the country by two major mosquito species, the *Anopheles funestus group* and *Anopheles gambiae complex*. *Anopheles funestus* account for the majority (56.3%) followed by *Anopheles arabiensis* (24.9%) and the least is *Anopheles gambiae ss.* (18.8%). Plasmodium falciparum is responsible for 96% of malaria infections in Mainland Tanzania and causes severe forms of the disease. The remaining 4% is attributed to other less virulent[1] plasmodia, mainly P. malariae and P. ovale as mono infection or mixed with P. falciparum.

Malaria burden has been on a declining trend in the country since 2010. For instance, Malaria incidence per 1000 population has decreased by 35% from 162 in 2015 to 106 in 2020. Malaria deaths have also followed a similar trend, but steeper. Malaria death rate per 100,000 population has decreased by 65% from 11.3 (2015) to 3.9 (2020). Findings of a school survey conducted in 2019 in all 184 Councils of Mainland Tanzania with 68,174 primary school pupils involved show that the malaria prevalence among primary school pupils aged 5 – 16 years is 14.1%, lower than 15.1% in 2017 and 21.6% in 2015. The pattern for malaria positivity rate in pregnant women attending ante-natal clinic (ANC) also shows a decreasing trend from 8.0% in 2015 to 7.7% in 2020.

The achieved malaria burden decrease is largely due to increase in Donor and Government funding to support the scale up of malaria control interventions including:

- Integrated Malaria Vector Control interventions including Increasing access and use of Long-Lasting Insecticidal Treated Nets (LLINs), Indoor Residual Spraying (IRS) in selected councils based on epidemiological suitability and Larval Source Management (Larviciding and environmental management).
- Malaria Diagnosis, Treatment and Preventive therapies.
- Surveillance, Monitoring and Evaluation.
- Commodities and Logistics management.
- Social Behavior Change (SBC) and Advocacy.
- Leadership, Partnership and Resource mobilization.

Tanzania's progress in malaria control is shifting the epidemiology of malaria from control phase towards sustained control and, eventually, to a pre-elimination phase. As Tanzania moves towards new phases of control it becomes increasingly imperative that cases are properly reported and followed-up and that programmatic and service provision indicators are continuously collected. The tools that have been used in the past (basic health facilities indicators and national representative surveys) have been both cost-effective and efficient in capturing useful data, but may not provide a clear picture of the gains made in malaria in the future.

[1] (National Malaria Control Programme, 2014)

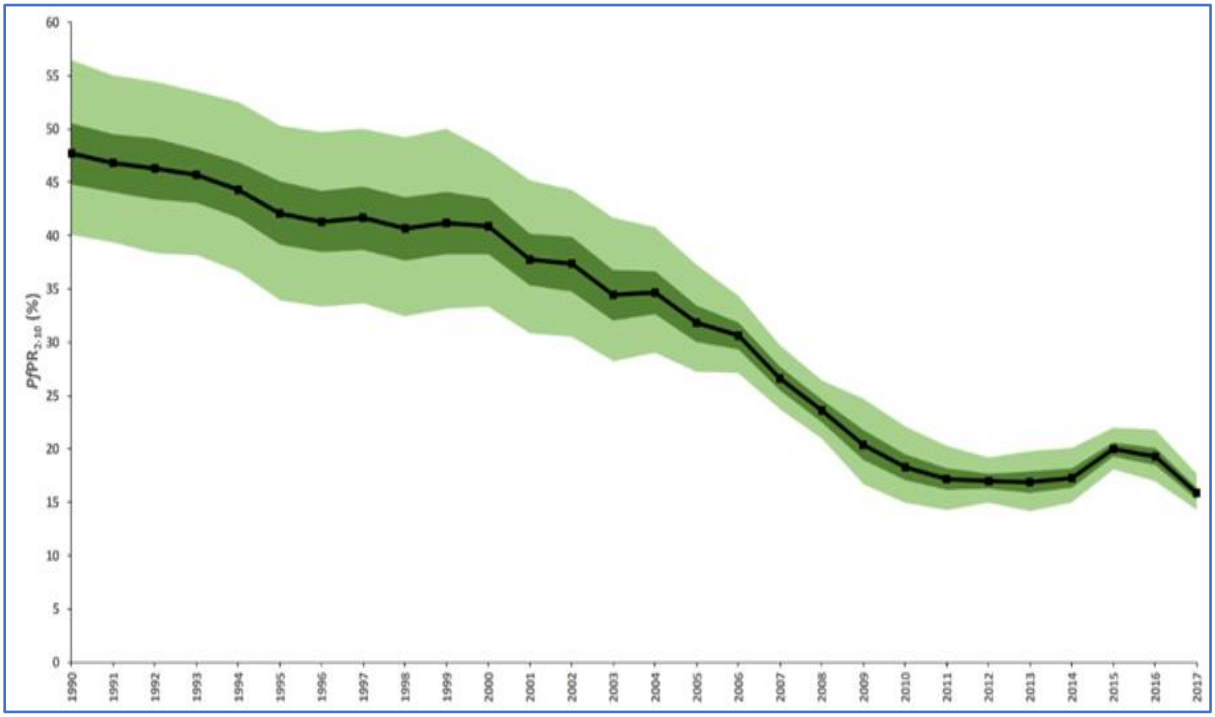
It is apparent that tools and procedures for Surveillance Monitoring and Evaluation (SME) that have served well in the past may not be sufficient to conduct effective and efficient SME in an environment of lower prevalence of malaria as is now being encountered in parts of Tanzania. For example, sample sizes of typical surveys used to do SME may not provide point estimates with small enough confidence intervals to enable comparisons across places and time. The uneven progress of malaria control across the country also poses challenges to typical SME procedures. While national coverage estimates may still be useful, additional emphasis will need to be placed on sub-national indicators to target malaria interventions more efficiently.

This document highlights NMCP's strategy to move towards a) passive surveillance through health facilities b) proactive, regular monitoring of parasite prevalence, vector distribution, and interventions coverage and c) active surveillance through follow up of passively detected cases in areas with very low malaria transmission risk.

## 1.2 Epidemiology of Malaria and its Control in Tanzania

Between 1990 to early 2000's, malaria in Tanzania was largely between the meso and hyper-endemic classes with an average *pf*pr$_{2\text{-}10}$ above 40%. Since early years of 2000s, a marked reduction of parasite prevalence was recorded reaching a hypo-endemicity level in the most recent years as depicted by **Figure 1**.

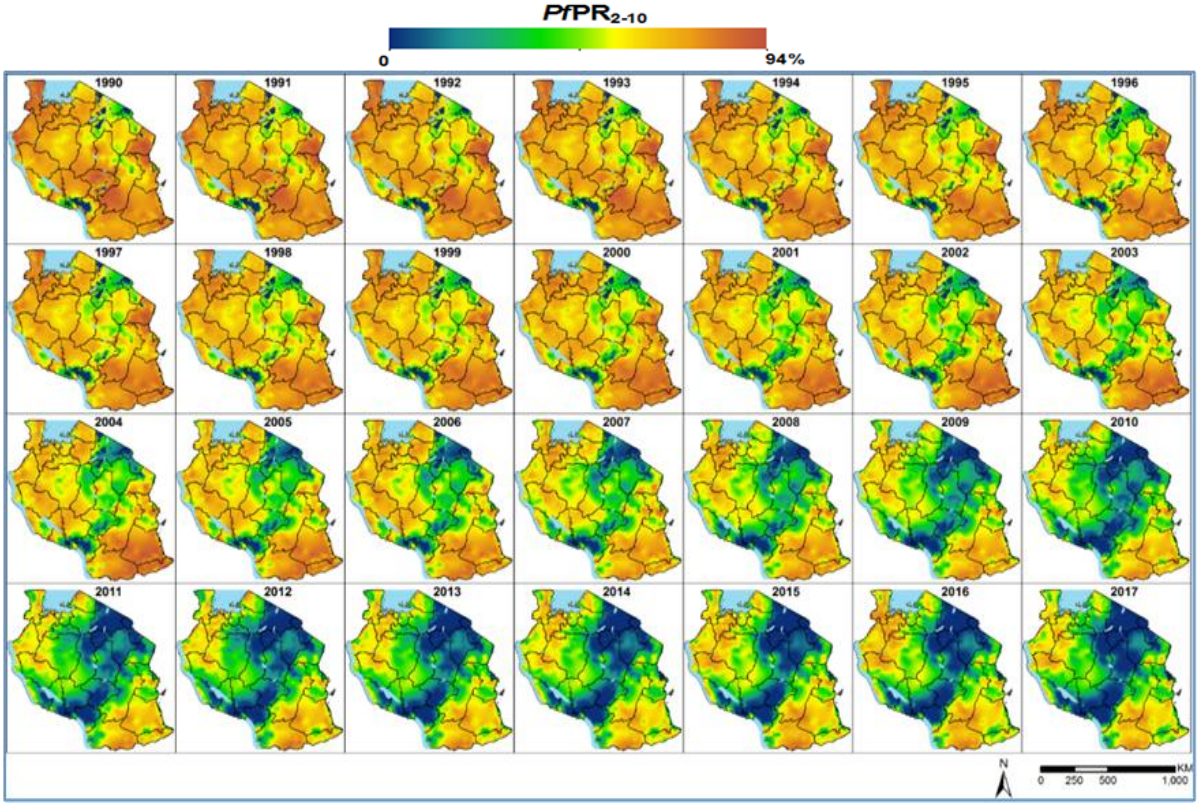
Figure 1: Mean Malaria Prevalence (Pfpr2-10 years,) in Tanzania 1990 – 2017




***(Source: NMCP/ KEMRI WELLCOME TRUST)***

In the period 1990-2017 the geographical distribution of malaria prevalence progressively revealed a heterogeneous distribution from very low endemicity in the central belt from the north to south to notably higher endemicity in the North west and South east of the country as shown by **Figure 2**.

*Figure 2: Tanzania Mean Malaria Prevalence (Pfpr2-10 years) 1990-2017*



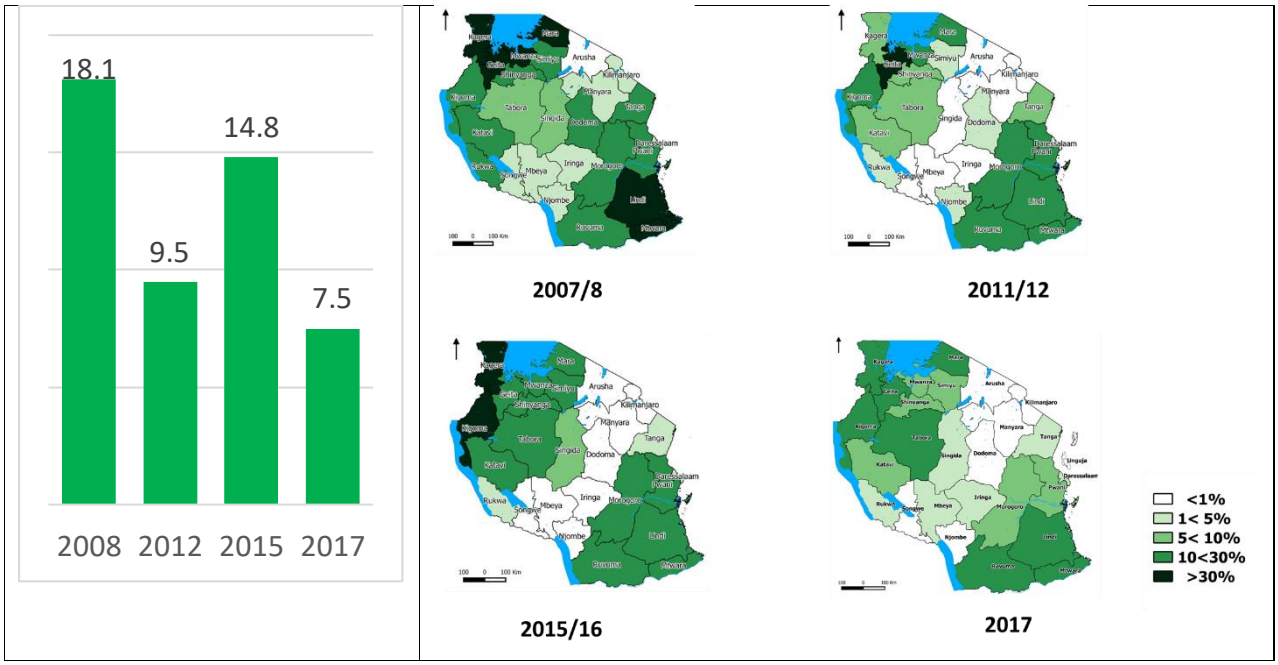

***Source: NMCP/ KEMRI WELLCOME TRUST***

## 1.3 Malaria Prevalence of 2 – 59 months children

Tanzania has the third largest population at risk of stable malaria in Africa, following Nigeria and the Democratic Republic of Congo, with 96% of mainland Tanzania population at risk for contracting the illness[2]. Comparing the TDHS/TMIS surveys conducted in 2007/2008 and 2017 it is evident that the prevalence of malaria has decreased significantly across all regions. Overall, malaria prevalence declined from 18.1% in 2007/2008 to 7.5 % in 2017 as depicted by **Figure 3**.

[2] (National Malaria Control Programme 2014)

Figure 3: Malaria prevalence of 2 - 59 months children – 2008 – 2017




***Source: TDHS/TMIS Survey***

As malaria prevalence across Tanzania continues to decline, surveillance, monitoring and evaluation of the disease will become increasingly important and play a larger role in disease elimination. The proposed changes to NMCP's surveillance, monitoring and evaluation systems will lead to realization of the following benefits:

- Focused interventions
- Identification of malaria prevalence trends over time and in specific regions of Tanzania
- Monitoring of health practices that are related to disease burden within the country.
- Generation of hypotheses for areas requiring improvement.

NMCP is confident that the planned surveillance, monitoring, and evaluation activities will contribute to an improved understanding of the malaria burden carried by specific geographies and communities within Tanzania, and push the country forwards towards elimination.

## 1.4 Malaria Transmission

The effectiveness of malaria prevention interventions such as LLINs, IRS, LSM and others depends on the intensity of parasite transmission and types of mosquito vectors that are present in the environment. The following factors make mosquitoes efficient carriers of the malaria parasites:

- **Vector Biology and Dynamics:**
  Different species of mosquitoes have their own preferences in terms of resting and feeding habits with implication on type of vector control interventions deployed.

- **Vectorial Capacity:**
  Mosquito vector species that transmit malaria (with emphasis on those of the Anopheles gambiae complex and Anopheles funestus group in Africa) have high vectorial capacity and are very efficient carriers of the disease and therefore able to maintain malaria transmission.
- **Adaptation to Environment:**
  Mosquito vector species populations are able to shift feeding, resting, and breeding behaviors to adapt to environmental challenges and human malaria interventions.
- **Resistance:**
  Mosquito vector species develop resistance to a variety of insecticides with time.

For the purposes of SME, it is important to understand the mosquito vector species geographic distribution in the country as they impact the tools employed to contain them from infecting humans (**Table 1***)*. In-country entomological monitoring as well as continuous review of international databases that report on vector prevalence and resistance should be key components of a well-designed SME plan.

Finally, changes in mosquito vector species resting and biting behavior, although not well studied until now in Tanzania, have important programmatic implications. Should malaria transmission continue to decline within the duration of this strategic plan's timeframe, additional SME, improved, more precise prevalence monitoring and case detection tools will be required to be introduced. This will include larger use of quality health facility generated data, serology and more sensitive diagnostic testing.

Table 1: Anopheline Mosquito vector species Transmitting Malaria in Tanzania

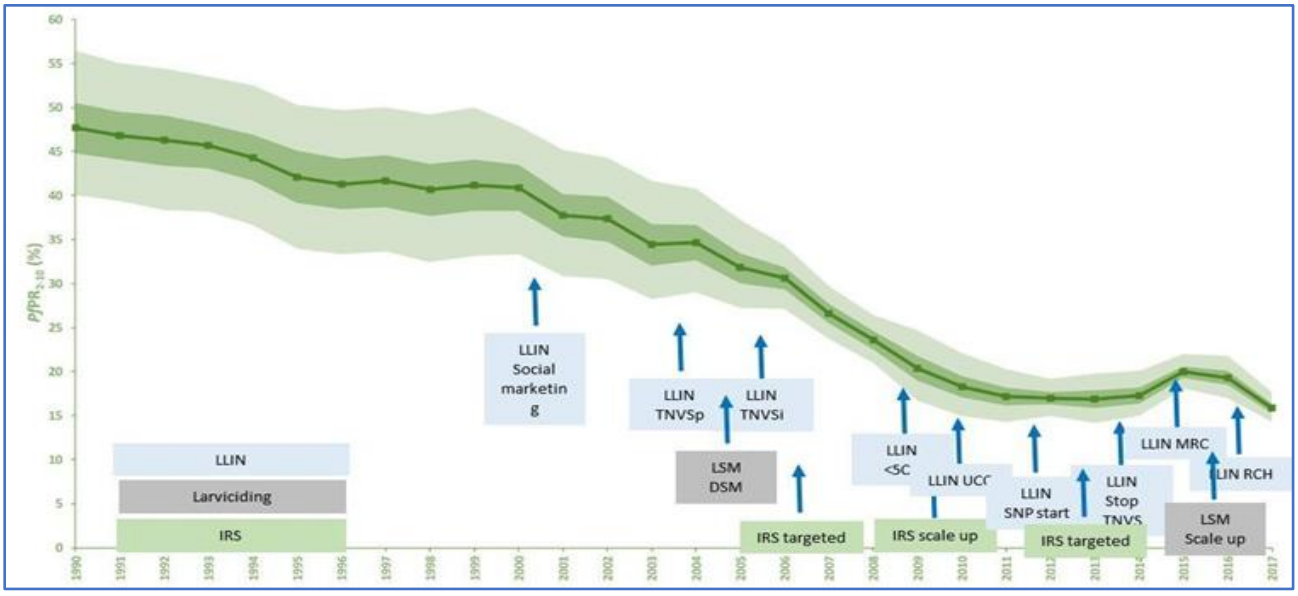
| Species | Behaviour | Distribution/Predominance | Habitat |
|---|---|---|---|
| *A. gambiae s. s.* | Endophilic<br>Anthropophilic<br>Endophagic | Throughout Tanzania but declining numbers in several areas. Predominant in the North west and South east of the country. | Shallow, sunlit, temporary bodies of water. |
| *A. arabiensis* | Exophilic<br>Anthropophilic<br>Zoophilic (cattle)<br>Exophagic | Widespread, but lower densities in Kagera, Kigoma, Katavi, Geita, Western parts of Mwanza and Mara regions. Currently considered the most predominant vector in Tanzania. | Wide variety of natural and artificial habitats |
| *A. funestus* | Endophilic<br>Anthropophilic | Widespread, South eastern Tanzania | Permanent or semi-permanent bodies of fresh water with emergent vegetation. |
| *A. merus* | | Minor vector present along coastal regions | |

## 1.5 Achievements in Malaria Control in Tanzania

**Integrated Malaria Vector Control**

In the country, there is progressive intensification of malaria vector control initiatives to combat malaria over the past decades as summarized in figure 6. After 2000 large ITN distribution schemes were initiated targeting the biological vulnerable groups through social marketing and discount voucher schemes (2000-2008) and later with mass campaigns (2009 to-date). A mix of catch up (mass replacement campaigns) and keep up (through schools and RCH clinics) net delivery systems were initiated in the early 2010s and is the current strategic approach for net distribution. The IRS schemes were introduced as pre-emptive epidemic control measures in unstable transmission areas of the lake zone in 2007 and subsequently scaled up to the entire zone between 2010 and 2013. Progressively the strategy has been scaled down to targeted IRS in councils with high incidence (2014 to-date). Bio-larviciding application started in mid 2000s targeting selected wards in Dar es salaam and were scaled up more recently (2017) countrywide. **Figure 4** summarizes the milestones for malaria vector control in the past decades. According to the MIS; the percentage of households' population with access to ITNs/LLIN within their household i.e. one net for two persons increased from 16% in 2004/05 to 63% in 2017.

Figure 4: Malaria vector control interventions and trends in malaria prevalence



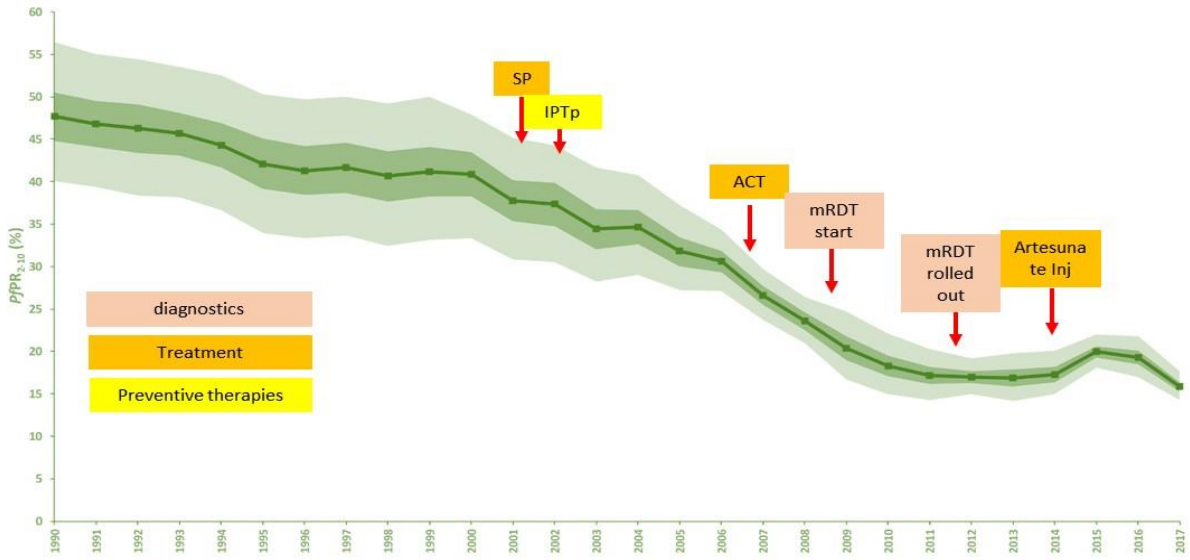

***Source: NMCP***

**Malaria Diagnosis, Treatment and Preventive therapies**

In the last decade, there has been two major breakthroughs in the management of uncomplicated malaria, shifting from antimalarials with lower to those of higher efficacy. **Figure 5** summarizes the milestones for malaria case management in the past decades. In 2001 Sulfadoxine Pyrimethamine (SP) replaced Chloroquine as the first line treatment and in 2017 the ACTs (Artemether-Lumefantrine) were introduced

countrywide. The second very innovative initiative was the progressive scale up of malaria RDTs to reach universal malaria diagnosis between 2009 and 2012. After demonstration of superiority of Artemisinin parenteral formulation compared to quinine for treatment of severe malaria, in 2014 Artesunate injectable was introduced in the country. The only malaria preventive treatments so far implemented in Tanzania is intermittent preventive therapy in pregnancy (IPTp), since 2002.

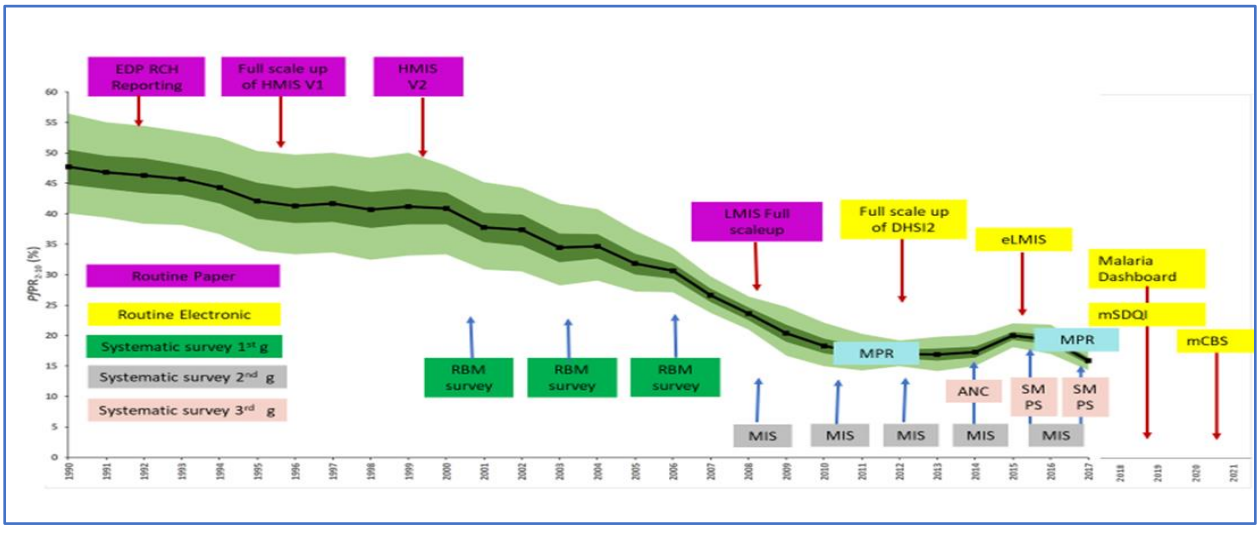
Figure 5: Malaria case management interventions and malaria prevalence trends




**Malaria Surveillance Monitoring and Evaluation**

There has been great progress in SME of malaria control interventions over the last decade. There has been a progressive shifting from paper based (EDP, HMIS) in the 1990s to mixed paper-electronic (HMIS, DHIS2) and entirely electronic (e-IDSR, e-LMIS, DHIS2) based on routine health information systems since 2013. Periodic surveys have been conducted regularly since mid-2000s. Specific malaria surveillance system has been introduced more recently with population sentinel surveys: ANC since 2014, SMPS since 2015, and MIS since 2008 as shown by **Figure 6**.

Figure 6: Innovative malaria SME interventions and malaria prevalence trends



**Social and Behaviour Change (SBC) and Advocacy**

Knowledge, awareness and attitude on malaria prevention, testing and treatment is above 89% and is almost universal in both urban and rural areas. However, the knowledge on malaria as a serious risk is low at 57%. Exposure to malaria messages is high to 84% with variations in background characteristics like rural urban and wealth where exposure to message is 80% in urban and 76% in rural, and exposure to malaria message increased with increasing wealth, from 65% in the lowest quintile to 96% in the highest quintile (MIS 2017).

Implementation of social and behavior change and advocacy activities is through multiple and complementary approaches that include mass media (Television, radio, print materials and social media), mid- media approach (community wide events, road shows, Public Address System, community theatre and performances), community mobilization/outreach emphasizing Interpersonal communication through community mobilizers (Community Change Agents) and through Health care providers.

## 1.6 Malaria risk stratification

WHO defines malaria risk stratification as "classification of the geographical areas or localities according to factors that determine receptivity and vulnerability to malaria transmission"[3]. Stratifying areas according to the malaria burden allows for deploying effective malaria control tools to areas in greatest need and maximize impact and efficiency. It is therefore an important tool for decision making and planning of malaria vector control operations. Stratification should be a dynamic process and should be conducted periodically to allow continuous monitoring of epidemiological trends.

The recently launched High Burden High Impact initiative (HBHI) emphasizes the use of data to shift away from a "one size fits all" to a more tailored malaria control approach in order to accelerate progress against malaria. In line with this, mainland Tanzania employed a country-led data-driven approach to develop a national malaria risk stratification and divided the country into four malaria epidemiological strata (**Table 2**). Based on the recommendations from WHO, as well as consideration of the availability, frequency and robustness of malaria data, the following malaria indicators were used to conduct the stratification: 1) Parasite prevalence in school children from school surveys (*Pf*PR$_{5to16}$), 2) fever test positivity rate (TPR), 3) annual parasite incidence (API), 4) confirmed malaria incidence and 5) malaria positivity rate in pregnant women.

Table 2: Characteristics of the epidemiological strata

| Stratum | Description | Strategic target |
|---|---|---|
| Very Low | Malaria incidence and prevalence is very low. Acquired immunity is always very low in the population living in this stratum. All age groups are at risk and are affected equally. The detection of imported and introduced malaria | Elimination |

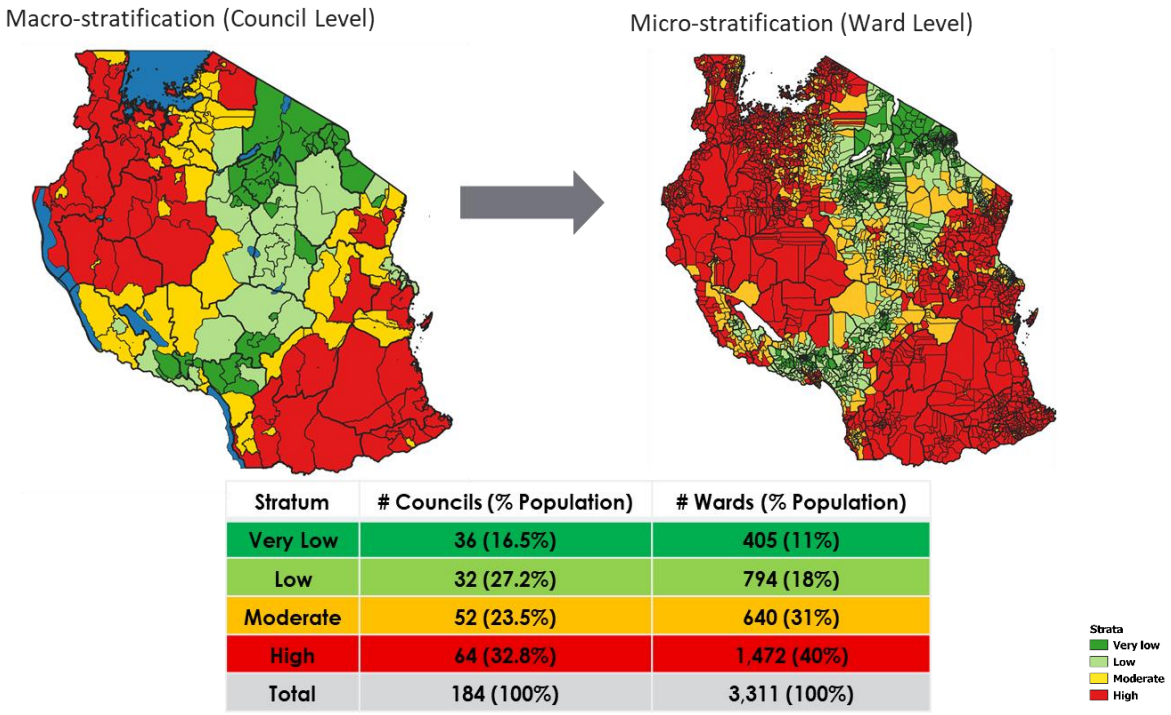
[3] World Health Organization, WHO malaria terminology. 2016. Updated in March 2018

| Stratum | Description | Strategic target |
|---|---|---|
| | cases is frequent. Identification of residual transmission foci responsible for local infected cases is the highest priority. | |
| Low | The main characteristic of this malaria risk stratum is unstable and seasonal transmission. The relatively low incidence has been reached after several control efforts and there is always risk of rebounds and or outbreaks. General preventive and curative malaria control efforts should be maintained and intensified surveillance is needed. | Elimination |
| Moderate | This stratum is characterized by a situation of epidemiological transition from low to high transmission risk. The stratum is very potential for progressing towards lower risk level. Standard preventive and curative malaria control initiatives should be maintained or reinforced. Universal coverage of interventions is highly needed. | Burden reduction |
| High | Several areas in this stratum show a high level of resilience to change the transmission level after several control efforts over the time. Additional preventive and curative interventions are necessary to decrease the high malaria risk. | Burden reduction |
| Urban | This is not an epidemiological stratum but rather an operational one. The interventions for this stratum would thus be aligned to the interventions for the stratum within which the geographical areas fall. Additional and dedicated malaria service delivery mechanisms are required to properly intervene in the peculiar ecological, demographic, socio-economic conditions typical of urbanized areas. | Both Elimination and Burden reduction |

In mainland Tanzania, the stratification of malaria is seen at two levels:

- **Sub-national level (Region and Council) also called Macro-stratification**: Currently, health planning of malaria control in Tanzania considers councils as the primary unit for resource allocation and operationalization of interventions for which decisions are made at national level. This level of stratification is expected to be conducted annually at national level for monitoring purpose and every 3 years for evaluating impact of stratified control strategies (**Error! Reference source not found.**7).
- **Sub-council level (Wards) also called Micro-stratification**: As the country moves towards implementing a targeted malaria control approach, a more granular stratification of malaria risk at sub-council level is valuable in informing council health managers about the malaria situation in respective wards. This level of stratification is expected to be conducted annually by CHMTs for identifying the wards at high malaria risk and planning appropriate vector control interventions (**Figure 7**).

Figure 7: Stratification of malaria risk in mainland Tanzania (2020)




| Stratum | # Councils (% Population) | # Wards (% Population) |
|---|---|---|
| Very Low | 36 (16.5%) | 405 (11%) |
| Low | 32 (27.2%) | 794 (18%) |
| Moderate | 52 (23.5%) | 640 (31%) |
| High | 64 (32.8%) | 1,472 (40%) |
| Total | 184 (100%) | 3,311 (100%) |

## 1.7 National Malaria Strategic Plan Vision, Mission, Goals and Objectives

The **vision** for National Malaria Strategic Plan 2021 – 2025 is for Tanzania to become a society free of malaria. This vision is driven by the **mission** to ensure all people in Tanzania have equitable access to sustainable, quality, effective, safe, and affordable malaria preventive and curative services through efficient collaborative partnership and community ownership. To ensure that the vision is achieved, the NMCP has identified a more specific goal of reducing the average malaria prevalence in children aged less than 5 years (pfpr6-59) from 7.5% in 2017 to less than 3.5% in 2025.

The strategic plan outlines key strategic objectives and action plan during the period 2021-2025. The document discusses the key technical and supporting strategies necessary for the ongoing fight against malaria. Furthermore, the plan provides a high-level guide for the implementation, coordination, and monitoring of malaria activities of the Government of Tanzania, Regional and Local government authorities, Development partners, Implementing organizations, Academic institutions, and the Private sector.

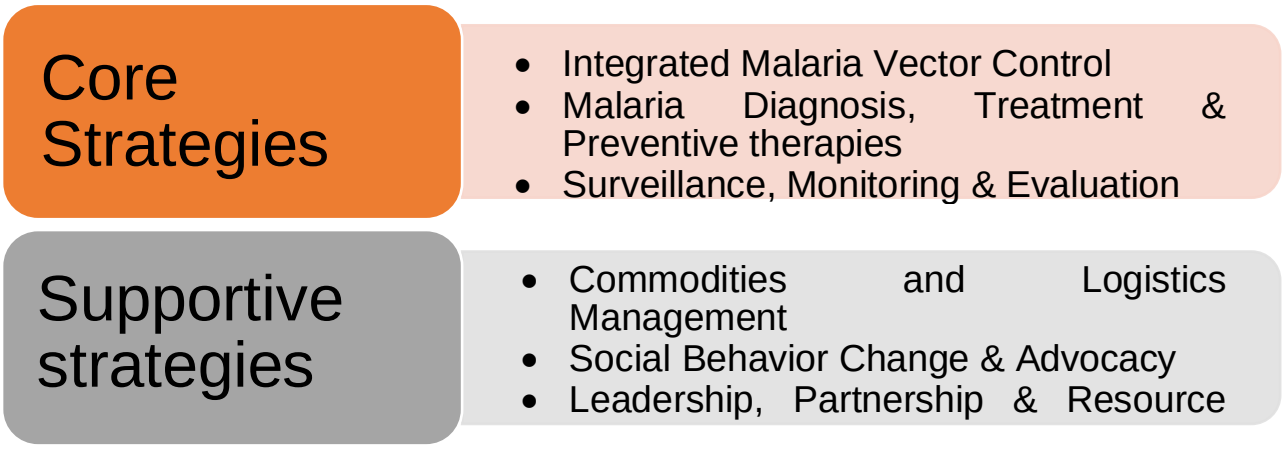
There are six key strategic objectives, outlined below, that are included in National Malaria Strategic Plan:

1. Reduce malaria parasites transmission by maintaining recommended evidence-based vector control interventions according to the targeted malaria risk strata.

2. To prevent the occurrence of mortality related to malaria infection through universal access to appropriate diagnosis and treatment and targeted provision of preventive therapies for vulnerable groups.
3. To provide timely and reliable information on malaria and its control needed to take appropriate actions in different transmission risk and ensure resources are used in the most cost-effective manner.
4. Maintain timely availability of safe and quality malaria commodities and supplies at the delivery points.
5. To strengthen an enabling environment where individuals at risk from malaria are empowered to protect themselves and their families from malaria and seek proper and timely malaria-treatment
6. To strengthen efficiency and effectiveness coordination on malaria implementation strategies via accountable partnership.

Each **strategic objective** is measured by **impact indicators**. The strategic objectives are implemented through different **strategic approaches** (specific objectives) measured by outcome indicators. The strategic approaches depend on a number of service **delivery mechanisms** measured by **output indicators** (See **Figure 8** and Appendix 1). These Indicators allow NMCP and its partners to measure progress against set objectives and are driven by data that is collected and analysed by NMCP's SME activities. In this way, SME activities impact all other activities of the programme. Social and Behavior Change and Advocacy (SBC&A) , Malaria Commodities and Logistic Management and Leadership, Partnership and Resource mobilization are three functions that also span malaria Preventive and Curative interventions.

Figure 8: Malaria core and supportive strategies




***Source: NMSP 2021-2025***

## 1.8 Goal of Malaria Surveillance, Monitoring and Evaluation

As stated in the NMSP 2021 – 2025, the overarching objective of SME activities for the next five years is three-fold, and is:

- Provide timely and reliable information for assessing progress towards the set global and national targets,

- Provide timely and reliable information needed to take appropriate actions in different transmission risk, and
- Ensure resources are used in the most cost-effective manner.

Strategic decisions made at the programme level are informed by this overarching objective.

**Malaria Surveillance, Monitoring and Evaluation Objectives**

The NMCP's strategic plan identified the following three Strategic Approaches / Specific Objectives, which will serve to address the interventions during the implementation period. These objectives are specific, and each is supported with individual activities and indicators of progress towards their achievement.

***Objective 1:*** *Strengthen comprehensive malaria surveillance and response for improved programmatic performance*

***Objective 2:*** *Strengthen malaria framework for collecting, processing, and storing essential indictors from periodic service delivery and programmatic surveys*

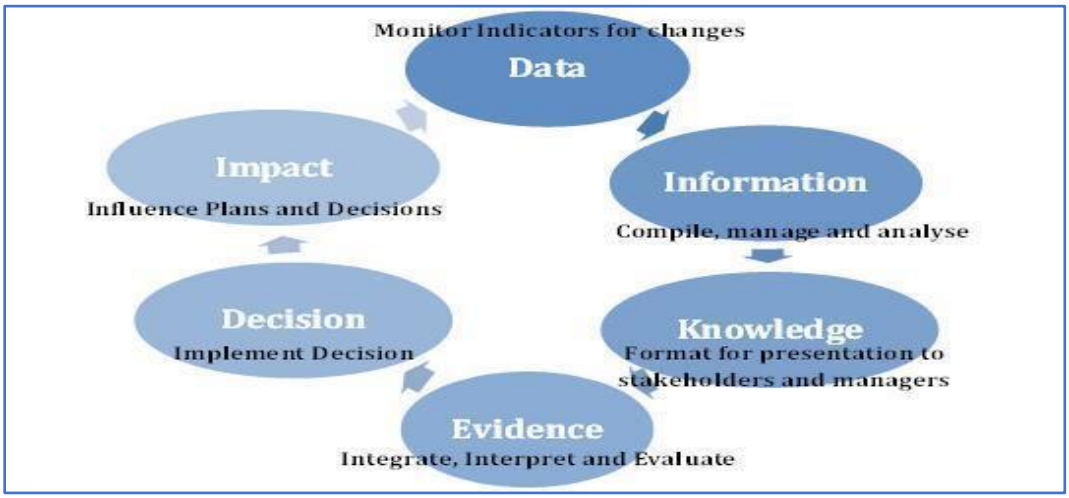
***Objective 3:*** *Strengthen a comprehensive malaria strategic information system to generate knowledge for evidence-based planning and decision making at all levels*

The above specific objectives are supported by extensive routine and periodic SME systems and surveys. The processes and tools used for data management and analysis are described in the next sections.

**Scope of Malaria Surveillance, Monitoring and Evaluation**

The collected **data** should be analysed and transformed into **information** that is able to generate **knowledge** and eventually **evidence** to help managers to make and implement **decisions** that will result in the desired **impact**. The scope of SME is to influence plans and decisions through a continuous process that aims to integrate, interpret and evaluate indicators that are monitored, compiled, arranged, analyzed and presented to stakeholders and policy makers (**Figure 9**).

Figure 9: The scope of malaria Surveillance, Monitoring and Evaluation



## 1.9 Identified SME Challenges

The NMCP and its strategic partners have made significant progress in malaria Surveillance, Monitoring, and Evaluation. As new surveillance tools are implemented and the scale of existing systems is expanded, challenges become more apparent. The following challenges have been identified in the preparation and creation of this document:

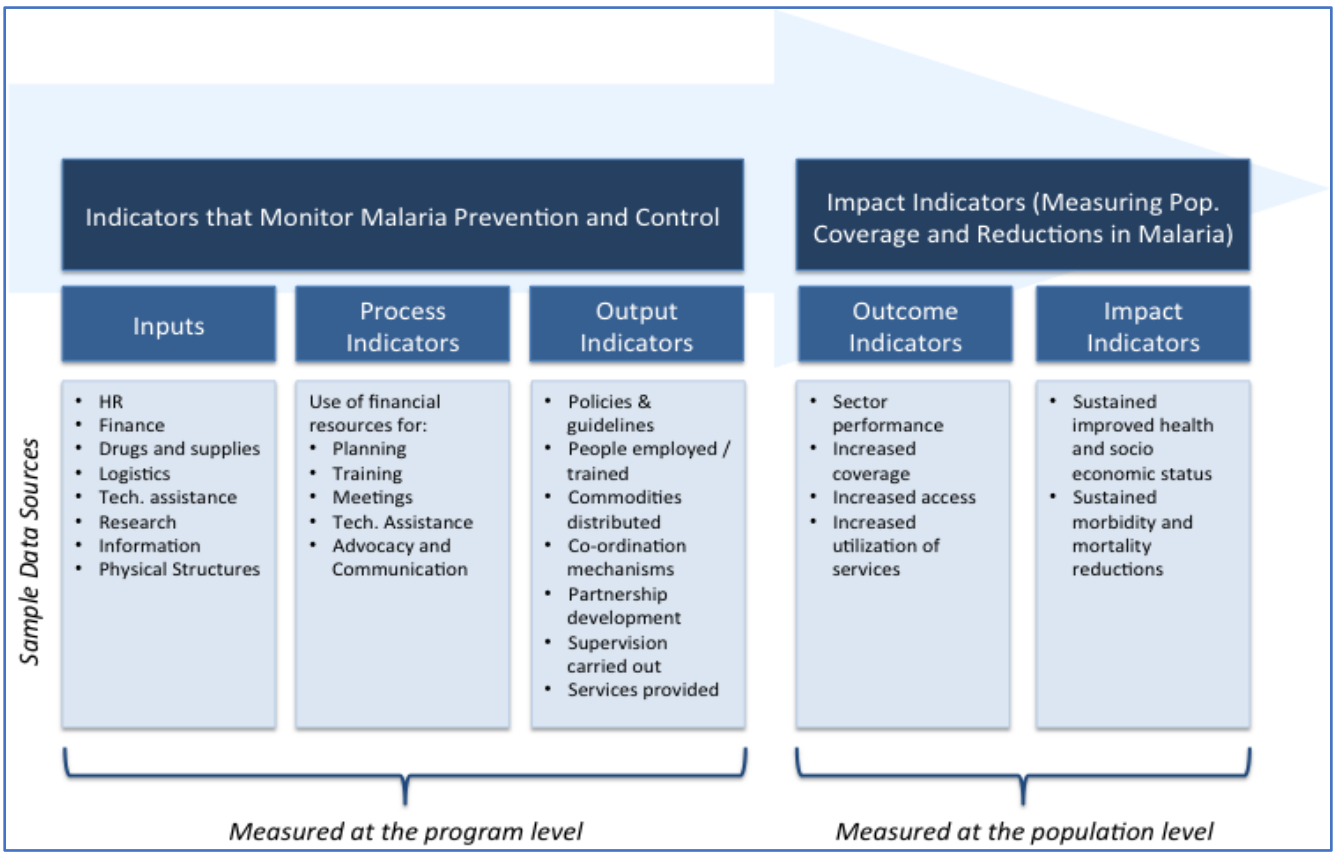
- Weak implementing partners' coordination: The NMCP implementing partners are usually generating conspicuous amount of information; there are a few established mechanisms or occasions for information sharing.
- Datasets managed by implementing partners are not synchronized with a central database; the existing, though fragmented, national malaria datasets require improvement in data quality, timeliness, completeness, and regular updating to generate reports; the databases used by implementing partners have different formats for data management, thus making importation and management of data from partners' databases tedious and time consuming.
- Delayed sharing of operational research findings, for decision making: a current challenge experienced by NMCP is the ability to gather and analyze data in a timely fashion such that it can be used to make evidence-based decisions.
- Data accessibility and dissemination is a key challenge that currently exists in malaria monitoring and evaluation; this challenge is partly driven by the limited access to data at multiple levels of the government organizations.

# CHAPTER 2: MALARIA INDICATORS

## 2.1 Type of Indicators

In order for Ministry of Health strategic interventions to be executed successfully through National Malaria Control programme , it is essential to monitor and evaluate all malaria control programme activities by setting indicators. This enables NMCP to assess its progress towards International and National targets to ensure resources are being used in the most cost-effective manner. The following SME model by RBM illustrates the various types of indicators which are collected to evaluate and track the success of a programme (**Figure 10**).

Figure 10: The WHO/Roll Back Malaria – SME Model




***Source :SME Plan 2015-2020***

Indicators explanations:

**Input indicators:** Track human and financial resources that are involved with programme operations. These may involve programme facilities, finances, and supplies – medication, medical and office supplies among others

**Process indicators:** Indicate the effectiveness and success of a programme's operations. They demonstrate whether the programme is being carried out according to the budget and schedule. Process indicators typically involve the monitoring of financial resources.

**Output indicators:** Measure immediate individual programme results. They inform the audience of the direct effect of the programme's activities.

**Outcome indicators:** Measure the intermediate changes (at a population level) as a result of the programme. These indicators are typically represented as a percentage or rate. Data for outcome indicators is typically found in census data, population surveys, or surveillance system.

**Impact indicators:** Measure the long term, cumulative improvement in a broad population's health and wellbeing. These indicators often measure morbidity or mortality rates, disease prevalence, etc. It is generally difficult to attribute the performance of a single programme activity to an impact indicator as it measures long term goals which multiple programmes or activities share.

### Core malaria Indicators

Assessment of intervention coverage, outcome and impact is a fundamental element for monitoring disease trends. Five impact and five outcome indicators have been identified as the core national indicators to evaluate the progress towards the achievements of the Malaria Strategic Plan. These indicators are basically collected in national and regional representative surveys (**Table 3**). Health facility-based surveillance indicators (summarized in **Table 4**) are able to capture key coverage indicators up to council level. A more comprehensive list of indicators together with the description of numerators and denominators is included under Appendix 1.

Table 3: Strategic Malaria Monitoring and Evaluation Indicators

| Indicator | Definition | Type of indicator | Data Source |
|---|---|---|---|
| **Annual Entomological Inoculation Rate (EIR)** | EIR is a proxy indicator for malaria transmission risk. It measures the number of infective bites received per person in a given limit of time in a human population. | Impact | Entomological surveillance report |
| **Malaria Mortality rate in Health facility per 100,000** | Mortality is a major component of the burden caused by malaria. Data for this indicator should be collected routinely through facility records including the results of malaria testing and diagnosis | Impact | Routine surveillance system HMIS/DHIS2 |
| **Proportion of councils with very low malaria transmission risk** | This indicator measures the number of Councils stratified in the Very low malaria transmission risk. | Impact | Malaria risk stratification report |
| **Annual Parasite Incidence** [4] | This indicator assesses the burden of malaria infection in the general population. | Impact | Routine surveillance system HMIS/DHIS2 |

| | | | |
|---|---|---|---|
| **Inpatients malaria cases** [5] | This indicator assesses the burden of malaria through the health system and provides trends of the burden of malaria in the general population in a stable malaria endemicity and stable reporting system. | Impact | Routine surveillance system HMIS/DHIS2 |
| **Proportion of the household population with access to an LLIN within their household (assuming one LLIN for every two people in a household)** | This indicator measures the level of LLIN use of all age groups at the time of the survey. It is useful to track usage among all age groups since coverage of the entire population will be required to accomplish large reductions in the malaria burden. While vulnerable groups, such as children under 5 years old and pregnant women, should still be prioritized, the equitable and communal benefits of wide-scale LLIN use by older children and adults should be promoted and evaluated by national malaria control programs. | Outcome | Household survey |
| **Malaria Case Fatality Rate** | Case Fatality Rate (CFR) intends to monitor the treatment outcomes for severe malaria patients admitted in health facilities. Timely referral of severe diseases, prompt and appropriate treatment and competence of the staff are the major factors affecting the rate, NMCP intends to monitor CFR as a proxy indicator of quality of health care for severe malaria patients. | Outcome | Routine surveillance system HMIS/DHIS2 |
| **Malaria test positivity rate** [6] | The Test Positivity Rate (TPR) or Slide Positivity Rate (SPR) assesses the proportion of tests (microscopy and/or RDT) that are positive for malaria among the fever patients tested. The test positivity rate is usually computed for a specified period of case detection activities. In areas with unstable malaria, an increasing test positivity rate among fever patients is one of the warning signs of a possible epidemic. WHO recommends a SPR <5% as transitional state towards malaria pre-elimination phase | Outcome | Routine surveillance system HMIS/DHIS2 |
| **% of women with live birth in the previous two years who received two doses or more of SP (IPTp2+)**[7] | NMCP guidelines recommend that all pregnant women receive two or more doses of IPTp during regularly scheduled antenatal visits under direct observation of a health worker. This indicator is used to measure the national-level use of IPTp to prevent malaria during pregnancy among women. | Outcome | Household survey |

[5] GF periodic review indicator

[6] GF periodic review indicator

[7] GF periodic review indicator

| | | | |
|---|---|---|---|
| **Proportion of children aged 6-59 months with fever who had a malaria test the same or next day after onset of a disease** | The replacement of conventional antimalarial drugs with high-cost artemisinin-based alternatives has created an increased need for accurate disease diagnosis. In addition to avoiding unnecessary treatment with these expensive drug combinations, diagnostics allow a more rational use of drugs that might effectively reduce drug pressure, thereby delaying the onset of drug resistance. | Outcome | Household survey |

**See appendix 1 for complete description of the indicators.*

Table 4: Key Coverage indicators

| Indicator | Definition | Type | Data Source |
|---|---|---|---|
| **Percent of house structures in the country sprayed with recommended insecticide(s) during the past 12 months** | This indicator allows overall national coverage of indoor residual spraying to be assessed. It is used to measure the proportion of households covered by IRS | Output | IRS report |
| **Proportion of confirmed malaria diagnosis** | Malaria treatment should be administered to patients with parasitological confirmation. The treatment on clinical ground should be reserved in exceptional cases. This indicator assesses the clinical performances of the healthcare workers. | Output | Routine surveillance system HMIS/DHIS2 |
| **Proportion of confirmed malaria cases that receive first-line antimalarial treatment according to national policy** | Prompt treatment with an effective antimalarial drug regimen is a key component of the technical strategy for controlling and preventing malaria. | Output | Routine surveillance system HMIS/DHIS2 |
| **Percentage of all suspected malaria cases that received a parasitological test** | This indicator assesses the diagnostic performances of the healthcare workers. According to the national guidelines all suspect malaria cases should be tested for parasitological confirmation.<br><br>The replacement of conventional antimalarial drugs with high-cost artemisinin-based alternatives and decreasing prevalence of malaria among fever cases has created an increased need for accurate malaria diagnosis. Accurate malaria diagnosis avoids unnecessary treatment with expensive drug combinations and ensures appropriate treatment for febrile patients.<br><br>Diagnosis allows for more reliable tracking of malaria burden and the impact of control | Output | Routine surveillance system HMIS/DHIS2 |

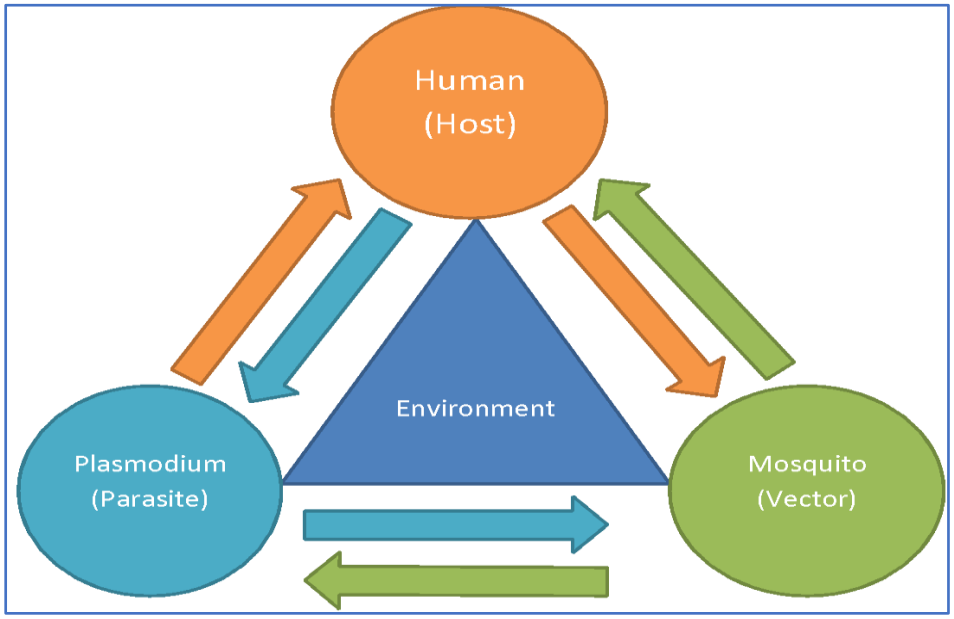
| | | | |
|---|---|---|---|
| | interventions. Accurate diagnosis allows a more rational use of drugs that might effectively reduce drug pressure, thereby delaying the onset of drug resistance. This indicator captures the baseline levels and subsequent scaling up of diagnostic programs within malaria-endemic areas. | | |
| **Annual malaria blood examination rate** | It is useful to measure the annual blood examination rate to ensure that potential differencesmin diagnostic efforts or completeness of reporting are taken into account. The annual blood examination rate is usually measured against the population. Alternatively, a very practical blood examination indicator is measured against the total number of people attending the OPD. | Output | Routine surveillance system HMIS/DHIS2 |
| **Proportion of pregnant women who received two or more doses of IPTp during ANC visits** [8] | In high burden areas with stable malaria transmission, Intermittent Preventive Treatment with at least two doses of recommended antimalarial medication (sulfadoxine-pyrimethamine) during pregnancy has been shown to significantly reduce the risk for severe maternal anemia, placental parasitemia and low birth weight. All pregnant women in areas with stable malaria transmission receive at least two or more doses of Intermittent Preventive Treatment during regularly scheduled antenatal care visits. | Output | Routine surveillance system HMIS/DHIS2 |

## 2.2 Malaria related Data Collection Systems and Sources of Information

Malaria transmission is determined by interaction between several factors (Vector, Parasite, Host, Environment and, eventually, malaria control interventions) as depicted by **Figure** 11.

[8] HSSP V indicator

Figure 11: Basic malaria transmission framework




Below is an example of how these factors can affect malaria transmission pattern.

- Mosquito vector species distribution and bionomics: some mosquito species have higher capacities for transmission than others, or have different rest and feeding habits
- Climatic parameters: rainfall, temperature and humidity, influences malaria parasite development in the mosquito
- Parasite associated factors: *P.falciparum* are more virulent and cause more morbidity and mortality compared to other malaria species
- Immunological background of the human host: people living in stable malaria transmission areas have higher immunity against malaria while children under five years, pregnant women and overseas travellers have lower or no immunity against malaria
- Socio economic factors: better housing, access to health services, level of education influence malaria transmission

Due to the complexity of malaria transmision, there is a wide variety of SME systems and tools to collect data for monitoring malaria transmission and malaria control interventions across Tanzania.

# CHAPTER 3: DATA MANAGEMENT FRAMEWORK

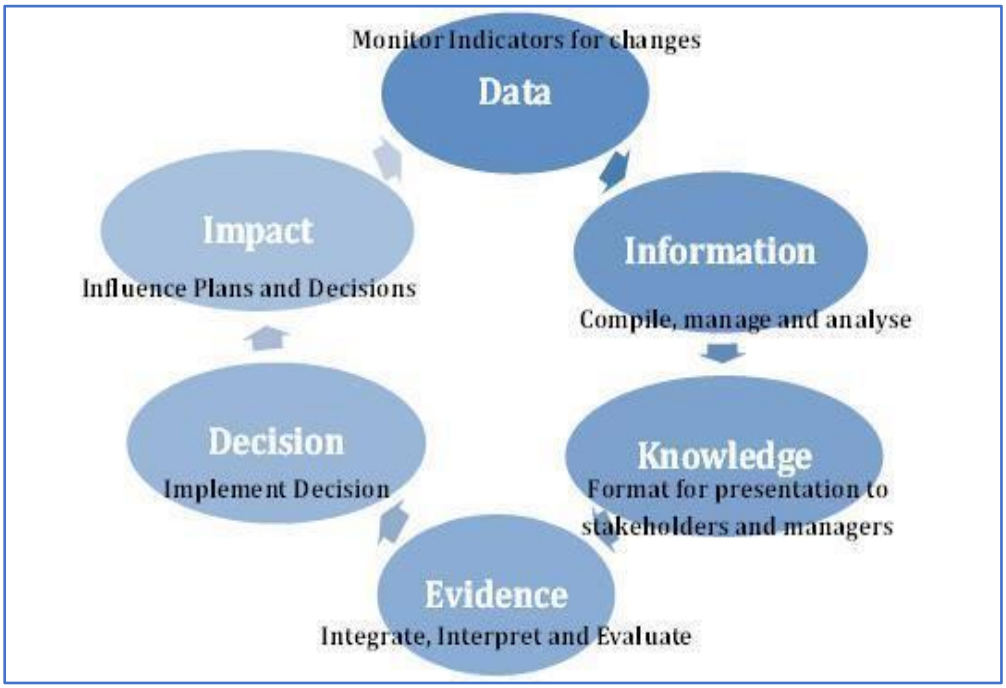
## 3.1 Introduction

Routine malaria data is a very important aspect for the National Malaria Control Program (NMCP) for monitoring malaria burden and intervention coverage at national and sub-national levels to make evidence-based programmatic decisions. The Surveillance Monitoring and Evaluation of malaria in mainland Tanzania depends on various data sources including; Health facility data reported monthly and Surveys such as drug efficacy testing, insecticide efficacy, and Malaria Indicator Survey (MIS). Other sources are programmatic i.e. implementation reports, supervision reports and evaluation reports.

Malaria data generated by health facilities are integral part of the Health Management Information System (HMIS). Therefore the HMIS with mandate to produce quality data is needed by the National Malaria Control Program (NMCP) to monitor malaria burden and intervention coverage at national and sub-national levels to inform evidence-based programmatic decisions.

Malaria data are processed through: Data collection, information generation, dissemination for Knowledge, evidence based for decision making to make impact as summarized in **Figure 12**.

Figure 12: Malaria Data Processing

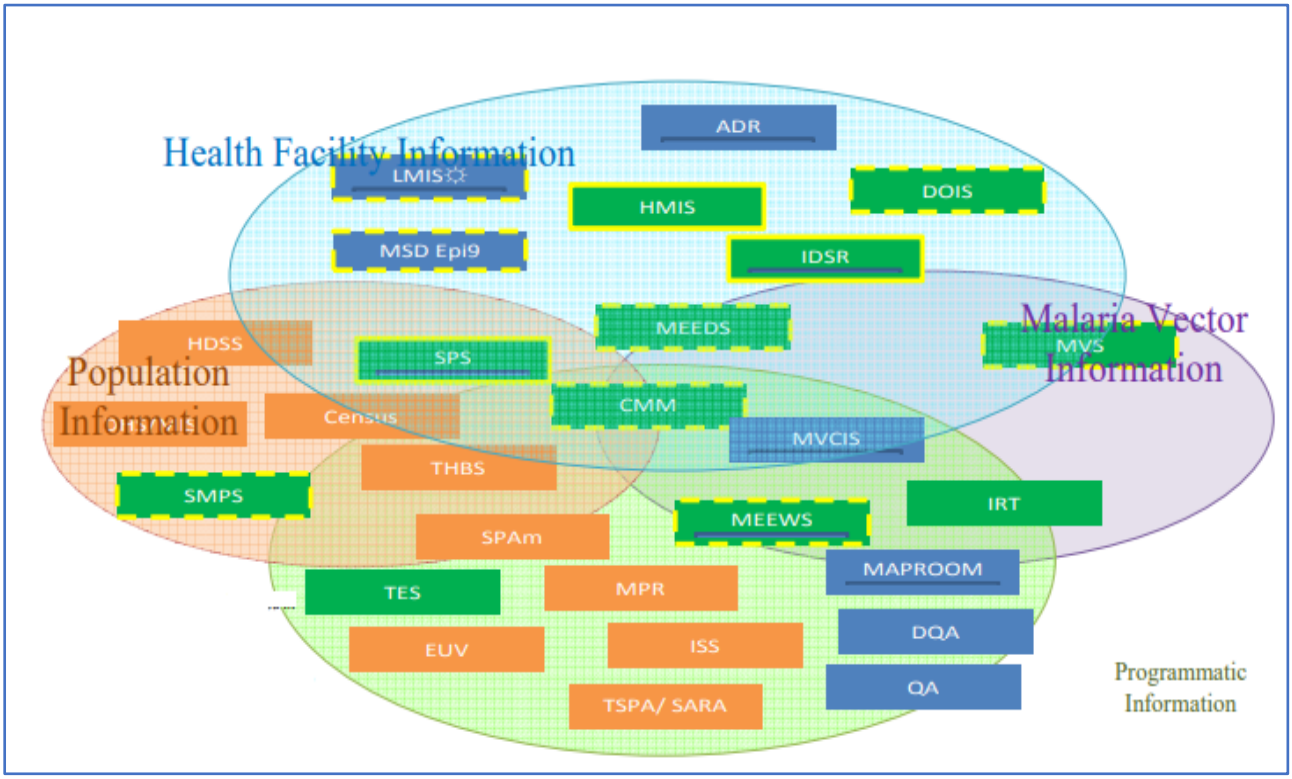



***Source:SME Plan 2015 – 2020***

## 3.2 Malaria Data Collection

As a result of the multiple elements of malaria transmission there are many different systems that are interrelated. This SME plan describes four key sources of data; population based, health facility, malaria vector dynamics, and programmatic activities. The diagrams presented in the synopsis shown in **Figure 13** highlight how the four sources of data are related and interacts with each other.

Figure 13: Synopsis of the malaria information system




Key:


### 3.2.1 Population Based Information

Population based data allows the Government of Tanzania and the NMCP to understand the intensity of malaria transmission among the population and the different geographical areas, impact of control measures, trends in malaria care and preventive services access as well as information on quality healthcare and malaria preventive services. Key sources of population based data that NMCP uses are: National Population Census (NPC), Demographic Surveillance System (DSS), Sample Vital Events Registration with Verbal Autopsy (SAVVY), Tanzania Malaria

Indicator Survey (TMIS), Tanzania Demographic and Health Survey (TDHS), Household Budget Survey (HBS), Sentinel Population Surveillance (SPS), School Malaria Parasitological Surveys (SMPS) and Community Malaria Monitoring (CMM).

- ***National Population Census (NPC)***

Data collected by the National Bureau of Statistics are used in support of SME various information for the programme such as estimation of denominators, calculation of malaria burden, planning and distribution of resources for interventions. Apart from demographic information the NPC also provides basic socio-economic data such as housing and access to water and power services.

- ***Demographic Surveillance System (DSS)***

The DSS approach involves periodic monitoring of households and members within households in cycles or intervals of every four months. The DSS collects information on demographic, socio-economic, and environmental characteristics of a population. The DSS in Tanzania is currently carried out in three councils (Kilombero, Ulanga and Rufiji) and is managed by research institutions.

- ***Sample Vital Events Registration with Verbal Autopsy (SAVVY)***

Sample Vital Events Registration with Verbal Autopsy (SAVVY) is a demographic surveillance system within Sentinel Panel of District (SPD) platform that collects and analyzes health community-based information data with intent to determine community birth trends and cause-specific mortality fractions in a population that has no complete or incomplete vital registration system. SAVVY provides nationally representative estimates of mortalities based on age, sex, residence, and zone, and it covers about 2% of mainland Tanzania population. The cause-specific mortality fraction, including malaria, is determined based on verbal autopsy interviews with next of kin or other caregivers. The SAVVY is managed by research institutions.

- ***Demographic and Health Survey (DHS)***

The DHS collects population-based data on reproductive, maternal and child health as well as mortality indicators. The sample is usually designed to produce separate estimates on key indicators at the national level for urban and rural areas, Social Economic Status, and other important strata. It is conducted by the National Bureau of Statistics (NBS) every 5 years. For purposes of the NMCP national SME plan, the objectives of the DHS are to provide data for measuring the following key indicators over time:

- All-cause mortality in children under 5 years old and infants.
- Proportion of households/children/pregnant women with at least one LLIN / have slept under an LLIN the previous night.
- Proportion of children with fever in last 2 weeks who received appropriate antimalarial treatment within 24 hours from onset.
- Treatment seeking behavior.
- Prevalence of anaemia in children 6-59 months.
- Malaria prevalence in children 6-59 months (added to the 2015 survey and previously done through Tanzania HIV/AIDS and Malaria Indicator Survey – THMIS).

The last DHS was conducted in 2015/2016. The next survey will be conducted in between 2021 and 2022.

- ***Malaria Indicator Survey (MIS)***

The Malaria Indicator Survey (MIS) is a cornerstone of NMCP's SME strategy. The survey has previously been administered every five years in conjunction with the HIV survey (THMIS). The last survey was conducted in 2017.

NMCP recommend continuing conducting MIS survey because it provides a lot of information such as malaria status, coverage of intervention, also it measures the impacts of malaria investment, help in plan and distribution of resources for interventions including malaria related knowledge and communications related to malaria prevention and treatment in general population. Furthermore, the results provide information to assist policy makers and the programme implementors to monitor and evaluate interventions and design new strategies for combating malaria. Stand-alone MIS (as well as DHS) are usually conducted during the dry season, therefore consideration must be made when comparing data taken in rainy and non-rainy seasons due to possible seasonal malaria transmission variations.

Finally, as Tanzania brings malaria under control and malaria prevalence declines, it will be increasingly difficult to estimate prevalence in extremely low transmission areas with precision. This will make broad surveys like MIS less and less appropriate. It is also likely that Tanzania will make uneven progress in malaria control – prevalence in some regions will decline faster than others. This trend has already been witnessed in the South and Northwest of Tanzania. This uneven progress may necessitate oversampling in some areas with lower prevalence.

- ***Household Budget Survey***

It is widely accepted that socio-economic indicators such as wealth and education are strongly correlated to disease prevalence. NMCP relies on a variety of data sources to capture socioeconomic information on various populations within Tanzania. One key source is the Household Budget Survey[9]. The survey's sample size was designed to cover Dar es Salaam, other regions, urban areas and rural domains[10]. The most recent Household Budget Survey was conducted in 2017/2018.

Moreover, Household budget survey also provides socioeconomic indicators such as: education, income, urban and rural distribution, and house structures are sourced from nationally representative surveys conducted by the National Bureau of Statistics and other Tanzanian Ministries as well as the MIS survey. NMCP has witnessed the trend that higher socio-economic strata of the Tanzanian population have a much lower prevalence of malaria when compared to poorer strata.

- ***School Malaria Parasitological Survey (SMPS)***

The inception of Roll Back Malaria Initiative in the year 1998 stimulated and increased partnerships, commitment, and investment in malaria control. As a result, Tanzania, like other malaria endemic countries, have made tangible progress in scaling up cost

[9] (Tanzanian National Bureau of Statistics 2011/2012)

[10] (Tanzanian National Bureau of Statistics 2011/2012)

effective preventive and curative interventions for malaria control. However, the major challenge is maintaining the gains and attaining further reduction of the malaria burden. Thus, a reliable and routinely updated malaria epidemiologic profile provides a good opportunity for effective and efficient planning for future malaria control as resources are diminishing from all sources.

Tanzania Demographic Health Survey and Malaria Indicator Survey are limited to National and Regional levels, whilst, School Malaria Parasitological Survey (SMPS) is designed to enhance NMCP's capacity to have a representative data at sub-Regional level and clearly ascertain the trend of malaria burden in children above 5 years.

The SMPS represents a specific platform that is powered to provide council up to village level information on malaria parasitaemia and are conducted more continuously (after every two years). Even with a very large sample size, SMPS is relatively inexpensive (compared to DHS/MIS) and easily conducted within the existing health system at council level. The SMPS collects parasitaemia data from children aged 5 - 16 years across a sample of public primary schools. This school age children represent a fair sentinel population due to relatively high enrolment rate (90%, BEST 2013). The survey, which is conducted in average of 2 to 4 schools per council, depending on the population size and malaria prevalence, is performed by NMCP in collaboration with PO-RALG, Regional and Council staff, Academia, and Research institutions.

The Council and lower levels (division/ward and village) representativeness is of paramount importance in the current epidemiological transition in order to assess malaria intensity in transmission foci. This kind of assessment is expected to enhance stratification of the territory in terms of malaria prevalence and to develop suitable and diversified strategies for its control according to the transmission intensity. Collaterally, information about LLIN usage, school absenteeism due to illness and anaemia prevalence is collected during the survey.

- ***Sentinel Population Surveillance at Antenatal Clinic (ANC)***

At present, the ANC Sentinel Population Surveillance (SPS) is conducted in all health facilities that report monthly malaria tests results - mainly by using mRDT - for pregnant women attending the clinic for the first time. Pregnant women are an ideal sentinel population due to high coverage of ANC attendances (98%, DHS 2015/2016). The NMCP is planning to expand the service to infants attending measles vaccination (approximately at 9 months of age) in selected health facilities - ideally all health centers in the country (approximately 625). Although the data are generated in Health facilities, the system intends to monitor the temporal and spatial malaria transmission intensity in the population up to village level. SPS used to monitor trends in malaria morbidity and geographical distribution with the following supportive objectives:

- Mapping lower-level malaria transmission intensity
- Inform programmatic decision-making
- Predict demand for services and service provision needs
- Advocate for malaria control resources
- Contribute to the development of a standard set of indicators for malaria surveillance

The pregnant women arm of Reproductive Health Services (RHS) Sentinel population system is already included in HMIS and in the DHIS2 platforms. The SPS produces data outputs that are particularly valuable for risk mapping and identifying seasonal transition. This type of data will become increasingly important as prevalence decreases country-wide, necessitating targeted interventions and monitoring and surveillance efforts.

- ***Community Malaria Monitoring (CMM)***

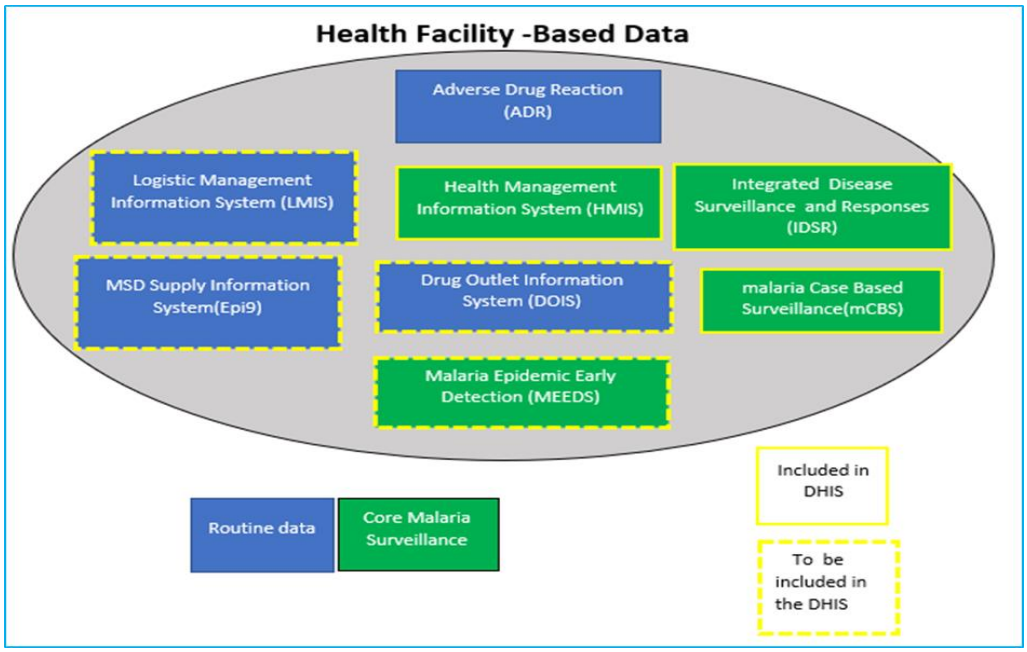
The MOH has posted an Environmental Health Officer for each ward in Mainland Tanzania. The Ward Environmental Health Officer (WEHO) is responsible for dealing with environmental health issues, water and sanitation, and annual home visits. The WEHO would report to the Ward Executive Officers (WEO) and to District Health Officers (DHO) on a quarterly basis. In an average sized ward, it would be possible for each home to be visited annually using both WEHO and Community Health Workers.

The NMCP intends to use this formal council healthcare cadre to gather information on malaria preventive services usage in the population through home visits that would be fed, eventually, into the DHIS system.

### 3.2.2 Health Facility Based Information

Health facilities are generating essential information through the routine data collection and reporting systems, basically HMIS and IDSR. Data are generated in all health facilities, public and private, and reported with a mixed system paper and electronically based. **Figure 14** and Table 5 outlines the various health facility-based monitoring and evaluation systems that are currently used by NMCP and the MOH.

Figure 14: Health facilities tools as part of SME Systems




***Source: SME Plan 2015 – 2020***

Table 5: Health Facility-Based Information Sources

| System | Indicators | Sites | Representation | Frequency | Responsible |
|---|---|---|---|---|---|
| Health Management Information System (HMIS) | Malaria cases, attendances, services, admissions, and deaths | All Health facilities | All levels | Monthly | MoH -M&E |
| Integrated Disease Surveillance and Response (IDSR) | Malaria cases, deaths | All Health facilities | Council and Health Facility | Weekly | MoH - Epidemiology |
| Malaria Epidemic Early Detection System (MEEDS) | Epidemic alert and actions | Selected areas (epidemic prone) | Council and Health Facility | Weekly | MOH - Epidemiology |
| Adverse Drug Reaction Reporting (ADR) | Passive Reactions | All Health Facilities | NA | Expected event | TMDA |
| Logistic Management Information System (LMIS) | Supply Chain Indicators | All Health Facilities | All levels | Quarterly | Pharmaceutical Services Section (PSS) – MOH, MSD |
| MSD Supply Information System | Tracer Medicine Stock and Adjustment | All Health Facilities | All levels | Monthly | PSS |
| Drug Outlets Information System (DOIS) | Supply Chain Indicators | Private Health Facilities | All levels | Monthly | Pharmacy Council and TMDA |
| malaria Case Based Surveillance (mCBS) | Malaria cases | Health facilities in Regions / Councils with very malaria transmission risk | Council and Health Facility | Immediate | NMCP |

- ***Health Management Information System (HMIS)***

HMIS is a routine system that collects data at both public and private health facilities. The HMIS provides a continuous flow of data, and relatively high reporting rate (around 94.3% both in public and private sector). At the initial stage of the introduction of electronic platform for HMIS i.e. DHIS2; the main focus was to ensure every facility avail their data in time regardless of its quality. However, the large number of contributors from both public and private sectors, provide an important insight into malaria testing and treatment services in Tanzanian communities. At a very high level, the HMIS highlights malaria “hot spots” where disease burden is high.

However; malaria data from HMIS is sometimes inadequate, incomplete and untimely, making it difficult to understand the impact of the current efforts of malaria interventions in relation to morbidity and mortality at health facility level. NMCP in collaboration with partners intends to improve the rate and quality of parasitological testing and reporting in the public and private sectors. The goal of this intervention is to improve the overall performances for malaria testing, treatment, and the related

information (Test Treat and Track - 3Ts). HMIS and DHIS standard malaria indicators are summarized under **APPENDIX 2: HMIS/DHIS2 INDICATORS**.

Strengthening HMIS is a quite complex intervention. It encompasses issues ranging from computer hardware to human behavior. It also requires long term commitment, a robust monitoring strategy during implementation, and honest evaluation upon completion. Current HMIS strengthening should focus on improving human resource capacity, complete, timely and accurate reporting to accommodate data demands of specific programmes and improve the quality of data recording and reporting. Specific recommendations for strengthening coordination of programmes and improving the quality of data include: training focal people at the health facility and district level to ensure complete/accurate reporting and improvement to existing data collection tools as needed to ensure accurate and standardized reporting of data for ascertaining data for impact indicators. Further review of the system is currently underway with the goal of finding ways to respond to the data demands of specific programmes in a timely fashion.

- ***Integrated Disease Surveillance and Response (IDSR) and Malaria Epidemic Early Detection System (MEEDS)***

The IDSR was established by the MoH to collect routine weekly epidemiological data (cases and deaths) of notifiable diseases to be used mainly for early detection and management of epidemics. The IDSR and HMIS use the same data collection tools in parallel but with different reporting tools and frequency.

The NMCP intends to use the eIDSR platform to generate weekly epidemiological (malaria cases) and programmatic (antimalarial stock status) information for the establishment of Malaria Epidemics Early Detection System (MEEDS). The eIDSR is interfaced within DHIS. The system is expected to generate alerts and action notifications based on the abnormal occurrence of malaria cases based on the provided thresholds or low antimalarial stock levels. This will constitute the basis for appropriate malaria outbreak and stock-out response.[11]

The ultimate goal for NMCP is to introduce IDSR/MEEDS to all the malaria unstable transmission areas across Tanzania. These areas are considered to be epidemic prone because malaria transmission is less likely to occur making the population less immune to the disease and more susceptible to severe disease. The use and scale of IDSR/MEEDS should be based on the volume and type of data that are needed in order not to duplicate and overlap the existing HMIS.

- ***Logistic Management Information System and MSD supply chain information system (Epi10)***

There are two major initiatives to report malaria commodities logistic management: Logistic Management Information System (LMIS) overseen by the Pharmaceutical Services Section (PSS) of the MoH, and Supply Chain Information System run by

[11] NMCP, Malaria Surveillance and Response Guidelines 2015

MSD. These systems include a combination of paper based and electronic records and reports.

LMIS has an electronic web-based interface (eLMIS) that includes health facility quarterly requisition and request while MSD information system is run with Epicor 10 platform and generates stock and commodities movement information including issuing records of all malaria commodities to public health facilities including batch numbers.

NMCP is actively involved in the delivery and utilization of the services provided by the two initiatives and is committed to promote and sustain a more integrated and efficient platform by a) improving the currently adopted technical solutions; b) establish an effective commodities surveillance linked with rapid stockouts response; and c) establishing an interface with the DHIS.

- ***Adverse Drug Reaction (ADR) Reporting***

The ADR observed by clinicians in the routine practice are reported to the Tanzania Medicines & Medical Devices Authority (TMDA) and recorded in a national registry. NMCP intends to work closely with TMDA to monitor the undesired effects of anti -malarials.

- ***Drug Dispensing Outlets Information***

The NMCP in collaboration with Pharmacy Council, TMDA and implementing partners will promote a novel routine information system to track stock movements of quality assured anti -malarials and mRDT in the private sector, from first line buyer to dispensing level.

Pharmacy Council and partners recently developed a web-based information system with interoperable mobile applications and piloted it in a few regions. The system manages information on facility registration, personnel qualifications and certifications, inspections, and licensing fee payment status for retail outlets. NMCP will assist the Pharmacy Council to develop further, integrate and, eventually, scale up the system to all private dispensing outlets.

### 3.2.3 Vector Control Data Sources

The IMVC component of the Malaria Strategic Plan 2021 – 2025 requires continuous monitoring of malaria transmission entomological indicators including the Entomological Inoculation Rate (EIR), and malaria vector population dynamics including speciation, density and bionomic. Entomological surveillance is an integral part of the comprehensive malaria surveillance framework. The system for Entomological surveillance is Council-based and encompasses a broad partnership between, NMCP, research institutions, Local Government Authorities and communities. Currently there are 62 entomological surveillance sentinel Districts/Councils in the country. Monitoring entomological variables, especially EIR, is a challenging activity and might be logistically and technically difficult when transmission is decreasing to very low level (

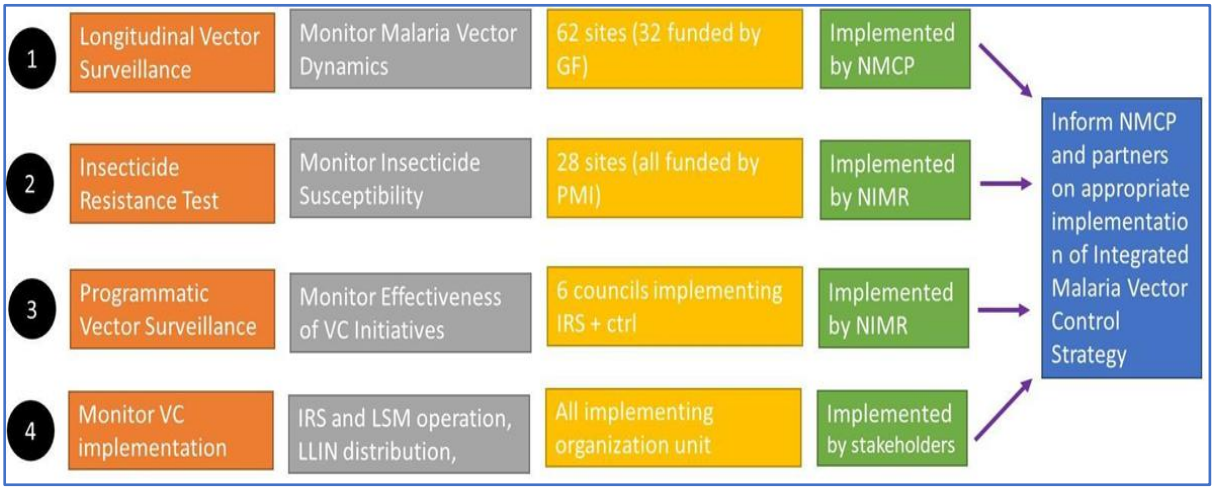
**Table** 6 and

**Figure** 15).

Table 6: Entomological Based Information Sources

| System | Indicators | Sites | Representation | Frequency | Responsible |
|---|---|---|---|---|---|
| Malaria Vector Surveillance (MVS) | Entomological Inoculation Rate (EIR), vector species and density, blood index | 2-4 sites per council; 62 councils | Regional, Council, | Monthly Quarterly | NMCP |
| Insecticide Resistance Testing (IRT) | Insecticide susceptibility | 28 sites | National | Annual | Research institutes |
| Malaria Vector Control Interventions Monitoring (MVCIM) | LLIN distribution, IRS and LSM performances | MVCI sites | National District Sub-district | Depend on initiative | NMCP |

Figure 15: Entomological Surveillance Plan




- ***Malaria Vector Surveillance***

A National Entomological Surveillance system will equip NMCP with a better biological understanding and timeline of the anopheles' mosquitoes that spread malaria. This knowledge would provide important information allowing NMCP and the MOH to target interventions and assistance to areas where transmission and prevalence are worst.

The National Malaria Vectors Entomological Surveillance is currently conducted in selected 32 sentinel councils within Tanzania, at between 2 and 4 sites per council. Data collection is conducted monthly and reported quartely. The sites used within each council are the same sites as the school's malaria parasitemia survey where other

surveillance efforts are currently ongoing. This will allow NMCP to gather surveillance and parasitological data from same site.

The malaria vectors basic indicators, including annual Entomological Inoculation Rate, species density and composition, will be initially monitored. Additional bionomics parameters such as indoor vs outdoor biting, early vs late biting and human blood index will be added.

For National Malaria Vector Surveillance to be successful, a partnership between NMCP and the research institutions (Ifakara Health Institute, NIMR, TPRI and KCMC) should be consolidated. For this endeavor to be successful, additional partner support is required.

- ***Insecticide Resistance Testing (IRT)***

Systematic national representative Insecticide Resistance Testing (IRT) was introduced in 2009 in 12 sentinel sites and is currently conducted in 28 sentinel sites. Tests are conducted by NMCP partner research institutions, coordinated by NIMR, in each sentinel site every alternate year. IRT follows standard WHO testing protocol.

- ***Routine Vector Control Monitoring Information System***

The major vector control initiatives need specific information systems to monitor the progress of the activities. Inputs, process, and outputs indicators are included in the respective systems. For LLIN two different systems are in place to monitor a) national mass distribution campaign and b) continuous distribution through RCH clinics and schools. The major indicators are: census of households, number of nets distributed and distribution points. For IRS the monitoring system includes the following main indicators: location of house structures, number of structures sprayed, number of staff trained, population protected. For LSM in relation to larviciding the main monitoring indicators are: number of targeted vector breeding sites, number and frequency of breeding sites treated with larviciding.

### 3.2.4 Programmatic Data Sources

A set of measurements are available to assess that all Tanzanians have access to quality, effective, safe, and affordable malaria preventive, and curative interventions through timely and sustainable collaborative efforts with partners and stakeholders at all levels (NMSP 2021-2025 mission). The strategic plan achievements are expected to be evaluated through periodic malaria programme reviews at the mid-term and at the end of the implementation period.

Monitoring and evaluation of timely and quality malaria diagnostics and treatment services in both private and public health sectors is an important programmatic matter to assess the progress towards the achievement of the malaria strategic plan. In this SME plan continuous service provision assessment will be carried out in health facilities. Efficacy of antimalarial medicines is also a major programmatic measure to maintain appropriate treatment services.

Vector control intervention assessment, including insecticide resistance, is another programmatic aspect to be monitored and it has been discussed in the previous

section. Other programmatic measurements related to weather conditions are also included in this section (**Table 7**).

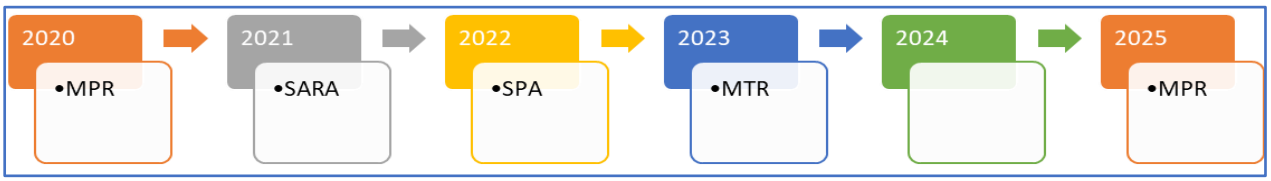
Table 7: Programmatic data sources synopsis

| System | Indicators | Sites | Representation | Frequency | Responsible |
|---|---|---|---|---|---|
| **Malaria Service and Data Quality Improvement (MSDQI)** | OPD,IPD, Laboratory, Pharmacy, Store and RCH indicators | All Health facilities | National | Quartely | RHMTs and CHMTs |
| **Tanzania Service provision Assessment (TSPA)** | Health care provision | Selected Health facilities | National | Every 5 years | NBS |
| **Service Availability and Readiness Assessment (SARA)** | Health care provision | Selected Health facilities | National | NA | Research institutions |
| **Therapeutic Efficacy Studies (TES)** | Clinical and parasitological cure | 8 Sites | National | Biannual | NMCP |
| **Supportive Supervision (SS) and Data Quality Audit (DQA)** | Programmatic indicators | Selected Councils and Health Facilities | National | Quarterly | NMCP |
| **Malaria Programme Review (MPR)** | Programmatic indicators | Selected Councils and Health Facilities | National | End term of Malaria Strategic plan | NMCP |
| **Meteorological Information Monitoring (MIM)** | Precipitation Temperature | Tanzania Meteorological Agency (TMA) weather stations | Zonal | Daily, Weekly, Monthly | TMA |
| **Malaria Epidemic Early Warning System (MEEWS)** | Weather Programmatic Socio-economic | Epidemic prone areas | Zonal, Council, Sub-council | TBD | NMCP |
| **Diagnostics and Medicine Quality Assurance (DMQA)** | mRDT and Antimalarials quality | Port of entry, selected Health facilities | NA | NA | TMDA |
| **Malaria Commodities Tracking and End User Verification (EUV)** | Pharmaceutical Management | Selected Facilities | All levels | Quarterly | NMCP |

- ***Expected timeline to conduct programmatic survey***

Figure 16 summarizes the major programmatic surveys implementation timeline.

Figure 16: Timeline for Programmatic Surveys Implementation.




- ***Meteorological Information Monitoring***

TMA is responsible for collection and dissemination of weather information from all regions in Tanzania. The parameters related to malaria transmission are rainfall (determinant of magnitude and duration of mosquitoes' breeding sites), humidity and temperature (low temperature is a limiting factor for effective sporogony in the vector). Usually extreme weather conditions, drought or flooding, might affect malaria transmission as well as abnormal increase in minimum temperatures especially in highlands. Therefore; it is important that NMCP continues to monitor trends in rainfall and temperature across the country. The Tanzania Meteorological Agency (TMA) will be used to ascertain the propensity of study areas to harbor mosquito populations, allowing for NMCP's analyses to control for periods of unusual dryness or wetness.

TMA, in collaboration with partners (IRI) is managing a web site that includes climatic parameters that are useful for interpretation of malaria transmission up to sub-district level: http://maproom.meteo.go.tz/maproom/.

- ***Malaria Epidemic Early Warning System (MEEWS)***

Long-term weather forecasting is expected to provide enough lead time for preparedness activities to mitigate incumbent malaria outbreaks or eventual rise in the number of cases. Actual rainfall and temperature data are also useful to predict the start of malaria transmission and to anticipate abnormal malaria transmission in case of excessive precipitations and temperatures.

The interruption of malaria control activities has been described as a triggering factor for malaria outbreaks. Sudden interruption of IRS and decay of LLIN might diminish the protection level within the communities. Interrupted supply of antimalarials might affect timely and effective treatment of malaria cases with potential progress of uncomplicated to severe cases.

Information about interruption of malaria control interventions such as minimum antimalarial stock levels, ageing LLIN, scaling down of IRS interventions, should be monitored and linked to an early warning system.

The comprehensive malaria surveillance framework proposed in this SME plan, that is contemplating programmatic and logistic elements alongside epidemiological data, will guide NMCP in gathering the necessary information and to provide alert and response to critical situations.

- ***Service Availability and Readiness Assessment (SARA) and Tanzania Service Provision Assessment (TSPA)***

The NMCP recognizes the need for additional data on service readiness in government, parastatal, private non-profit and private for-profit health facilities beyond the routine information on service delivery. NMCP will support health facility assessments carried out in coordination with other programmes such as Service Availability and Readiness Assessment (SARA) and Tanzania Service Provision Assessment (TSPA). These national representative surveys provide additional information on the facility infrastructure, equipment, medicines, pharmacy and laboratory services, record keeping, management, and counselling. Of critical importance for NMCP is the verification of health worker compliance with case management protocols through direct observation of clinical practices in health facilities, checking of caretakers understanding through post consultation interviews and, finally, monitoring health worker training and understanding of malaria case management.

- ***Diagnostics and antimalarials quality assurance test***

The Tanzania Medicines and Medical Devices Authority (TMDA) is monitoring the quality of malaria commodities at the port of entry and in the market. NMCP will liaise with TMDA to keep track of the quality of antimalarials available in the private market.

- ***Commodity Logistic Surveys (Malaria Commodities tracking and End user verification)***

The NMCP in collaboration with PMI implementing partners initiated in 2007/2008 a regular end user verification survey in selected health facilities at quarterly interval. The aim of the survey is to verify the quality of pharmaceuticals and supply management at zonal MSD and health facility level.

Regular commodities tracking surveys, e.g., ACT tracking, are conducted by NMCP as requirements of the GF grants management. Other implementing partners developed their own peculiar malaria commodities information system and related surveys. NMCP will work with partners to integrate and eventually merge the several initiatives to improve the cost-effectiveness of the surveys.

- ***Therapeutic Efficacy Studies***

Therapeutic Efficacy Studies (TES) are coordinated by NMCP under a dedicated task force and conducted by partner research institutions. Currently, TES covers 8 sites, 4 of which are surveyed each year. As a result, each site is monitored every other year. The TES sites were established in the late 1990s as it was crucial to have a system that could monitor antimalarial efficacy. Furthermore, TES are implemented to inform the selection of appropriate antimalarials to be used as a recommended treatment option in the country.

- ***Supportive Supervision***

Supportive supervision is essential to provide quality services and to verify the implementation of interventions. NMCP will continue to ensure that supervision by regional and district health management teams are conducted effectively and that the reports generated are accurate, complete, and timely. During this NMSP period the

NMCP in collaboration with PO-RALG and implementing partners will a) update and improve the supervision tools and checklists to be used by the regional and district teams during their supervision of health facilities, b) conduct training for district data managers and malaria focal persons and training on data management and proper reporting, c) work with regional and district authorities to ensure that there are sufficient resources in regional and district budgets for regular supervision visits, and d) focus NMCP supervision visits to the districts on verification of data and financial reports, as well as on capacity building of district staff.

- ***Malaria Service and Data Quality Improvement (MSDQI)***

In 2018 the country introduced the original Malaria Services and Data Quality Improvement (MSDQI). MSDQI is a comprehensive system for assessment of health facilities readiness to deliver standard malaria care, staff adequate performances, adherence to guidelines, consistency, completeness and timeliness of data management and client's satisfaction. The assessment is followed by the identification of gaps and the development of a quality improvement plan. All service delivery sections (OPD, IPD, Laboratory, Pharmacy, Store and RCH clinic) are assessed and respective plans are agreed upon.

- ***Data Quality Audit***

Data Quality Audit (DQA) has been recently introduced to validate the data that has been reported in DHIS2 at the level of the council and health facility. The DQA tools is one of the MSDQI modules which is designed to validate quality of reported health facility data. The NMCP scaled-up (introduction and orientation) the tools to all key focal persons and coordinators in all councils responsible for generating malaria data.

- ***Malaria Programme Review***

The Malaria Programme Review (MPR) is a periodic, collaborative evaluation for the NMCP. It aims at improving operational performance and delivery of malaria control interventions in order to reduce morbidity and mortality. The purpose of this review is to identify the programme's achievements in outcomes and impact, best practices, and lessons learnt during critical issues. Usually solutions are provided for more effective delivery, resulting in revision of programmes and strengthening of structures, system and capacity to achieve great equity, better coverage, higher quality and more effective delivery of anti-malaria interventions. The review is conducted in collaboration with the malaria programme, Government institutions and all implementing partners and stakeholders in relation to malaria control at all levels of health care delivery namely; national, sub-national and community levels.

## 3.3 From Malaria Data to Malaria Information

Each of the detailed data collection systems described in the previous sections, produces a unique output with indicators specific to that source. All data that originates from one of the above systems or surveys is submitted to a more senior level for approval. Data can originate from a variety of levels, including Health Facilities, District Malaria Focal Persons, and Regional or National representatives and institutions. The preferential flow of information from Health facilities is via DHIS.

Ideally, once reviewed, data should be sent to the SME unit of the NMCP and, eventually, entered into a comprehensive composite Malaria Database. The NMCP SME unit is supposed to aggregate the data and produce reports and publications for dissemination and utilization at various levels, such as the MoH, PO-RALG, Regional and Council HMTs, other Ministries, Government Organizations, Development partners, Implementing Partners, Research Institute and Community level.

### 3.3.1 The role and scope of DHIS2

The second generation of the District Health Information Software (DHIS2) is a web-based system that was introduced in the country in 2013. The majority of data are collected in the health facility in standardized HMIS tools (registers, tall sheet, and summary form) in paper based format and reported monthly to the respective council.

Data are entered into DHIS2 at council level and stored and elaborated into a Central database. Outputs are provided in form of tables, charts and maps. The system is also able to receive data directly from the health facilities through electronic devices (cellular phones or tablets). Within the DHIS2 there are multiple forms that capture different health facilities' data reported at different intervals depending on user's preferences. All people with credentials can access DHIS2.

In year 2020 the national average for health facility reporting rate was 97.8% with regional variance from 90.4% -100% while timely report was 96% (88.8% - 100%).

DHIS2 currently hosts all HMIS generated data and e-IDSR but it can accommodate more information generated at health facility and community level including:

- Logistic Information System
- Diagnostic Information System
- Community Malaria Monitoring
- Sentinel Population Surveillance
- Malaria Vector Surveillance

NMCP will work with stakeholders to improve and develop further malaria information linked with DHIS2.

### 3.3.2 Routine malaria data quality assurance

Existing national guidelines, HMIS manuals, and other related Standard Operating Procedures (SOPs), recommend all collected data at each Health Facility to be recorded for the purpose of planning and decision making at all levels. In each Health facility, sources of information for malaria data include Outpatient department (OPD), Inpatient department (IPD), Antenatal Care (ANC), laboratory, pharmacy, and drug dispensing unit. In the sections mentioned above, there are sets of tools (register, tally sheets and summary sheets). A client/patient is recorded into the respective register (depending on the type of care he/she is receiving) in line with tally sheets, to facilitate monthly aggregation of key indicators for the corresponding monthly summary report.

Monthly summary reports are prepared using the data recorded on the tally sheets, one copy of each report is sent to the District medical office and one copy is maintained

at the health facility. At the council level, data from the monthly summary reports are entered into DHIS2 , which can be accessed by those who have credentials. Bigger Health facilities like hospitals which have computer facilities and DHIS2 oriented focal points enter their report directly into DHIS2.

Thus, data quality/accuracy is assessed by checking the consistence of data in HMIS tool (registers, tall sheet, and summary form) against DHIS2, However the data quality can be altered at any point in the process of transferring data. Alteration can occur at health facility level (during recording of patient information/during preparing monthly summary), or can be at District level during compiling the report in District Health Information System (DHIS2) and this may lead to poor malaria data.

The DQA will be carried out by NMCP, RMIFP and CMIFP in collaboration with HMIS focal persons and other key staff at the respective levels. Full involvement of RHMTs and CHMTs is of paramount importance to implement appropriately the activity and to address the identified problems.

### 3.3.3 The NMCP data repository system

According to the malaria SME plan architecture, NMCP obtains a massive input of information. To be able to manage the data appropriately; a centralized Data Repository System (DRS) capable of capturing and storing records from different systems, organizing them, and providing standardized outputs for easy interpretations through a designed dashboard is needed. The DRS is flexible and provides a platform for analysis of data at different administrative and functional levels.

Administration of the system requires a competent, allocated human resources in addition to implementing the appropriate technical solution and related hard and software. The system is designed to gather information from malaria stakeholders and implementing partners.

## 3.4 From Information to Knowledge

### 3.4.1 Malaria interactive dashboard

Tanzania recently developed a comprehensive malaria surveillance framework includes four components (

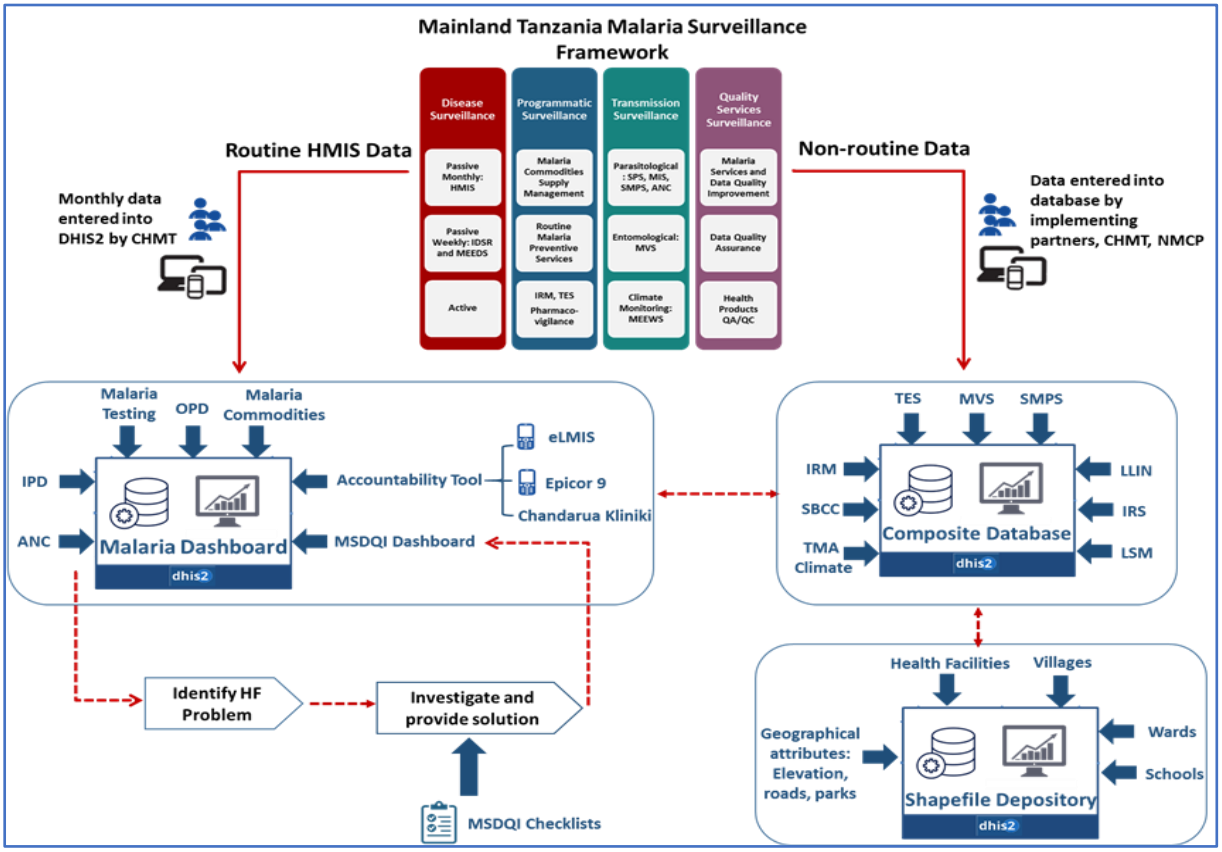
**Figure** 17):

- **Malaria disease surveillance:** Including passive monthly HMIS, weekly eIDSR reporting and active case detection.
- **Malaria control programmatic surveillance:** Including weekly antimalarial stock reporting, vector control initiatives reporting, malaria service provision assessment, malaria community monitoring and parasite and vector resistance monitoring.
- **Malaria transmission surveillance**: Including Sentinel Population Surveillance (SMPS and ANC); Malaria Vector Surveillance and meteorological monitoring.

- **Malaria quality of services surveillance:** Including supportive supervision, DQA and MSDQI

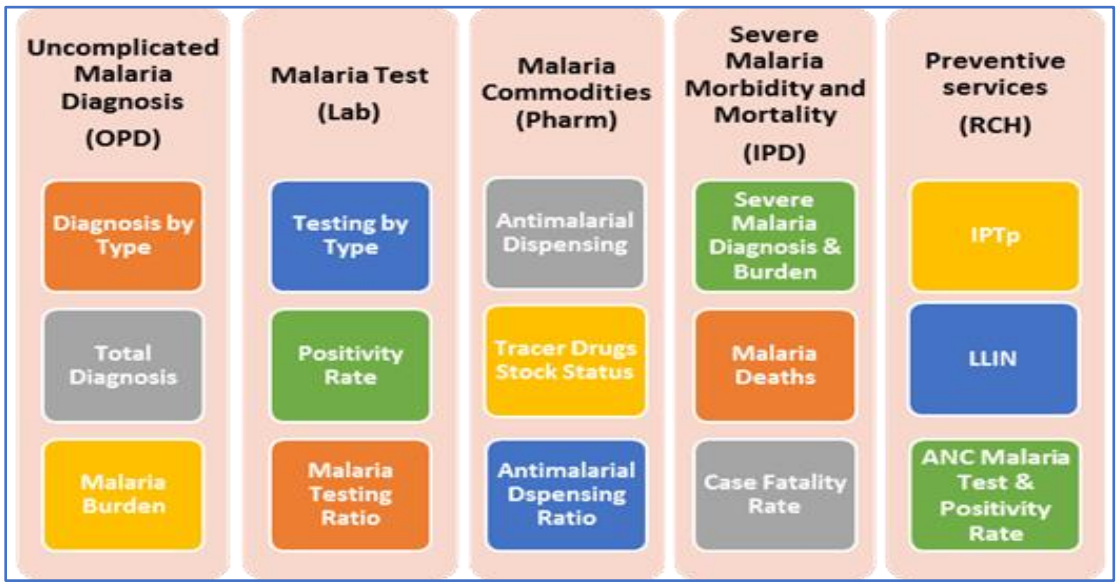
The framework is supported by a DHIS2 based data repository system that includes: a) DHIS2 routine information from health facilities and its interactives dashboard; b) accountability dashboard; c) malaria services and data quality improvement dashboard; and d) malaria composite database. The system is at different stage of completion with some components already at second generation platform, while others are still under development and still off line.

Figure 17: Mainland Tanzania Comprehensive Malaria Surveillance Framework




The **NMCP malaria dashboard** has been developed to facilitate the visualization, interpretation and use of all malaria related information in the DHIS2 platform. The dashboard is currently divided in eight (8) sections according to the HMIS collection tools and respective indicators: **a)** Uncomplicated malaria diagnosis (OPD), **b)** malaria testing (Laboratory/testing sites), **c)** Malaria commodities (Pharmaceuticals), **d)** Severe malaria morbidity, **e)** Malaria death (mortality) in (IPD), and **f)** Preventive services (Reproductive and Child Health), **g)** Accountability tool, and **h)** MSDQI (Figure 18). The dashboard electronic platform is available and accessible to all people with DHIS2 login credentials.

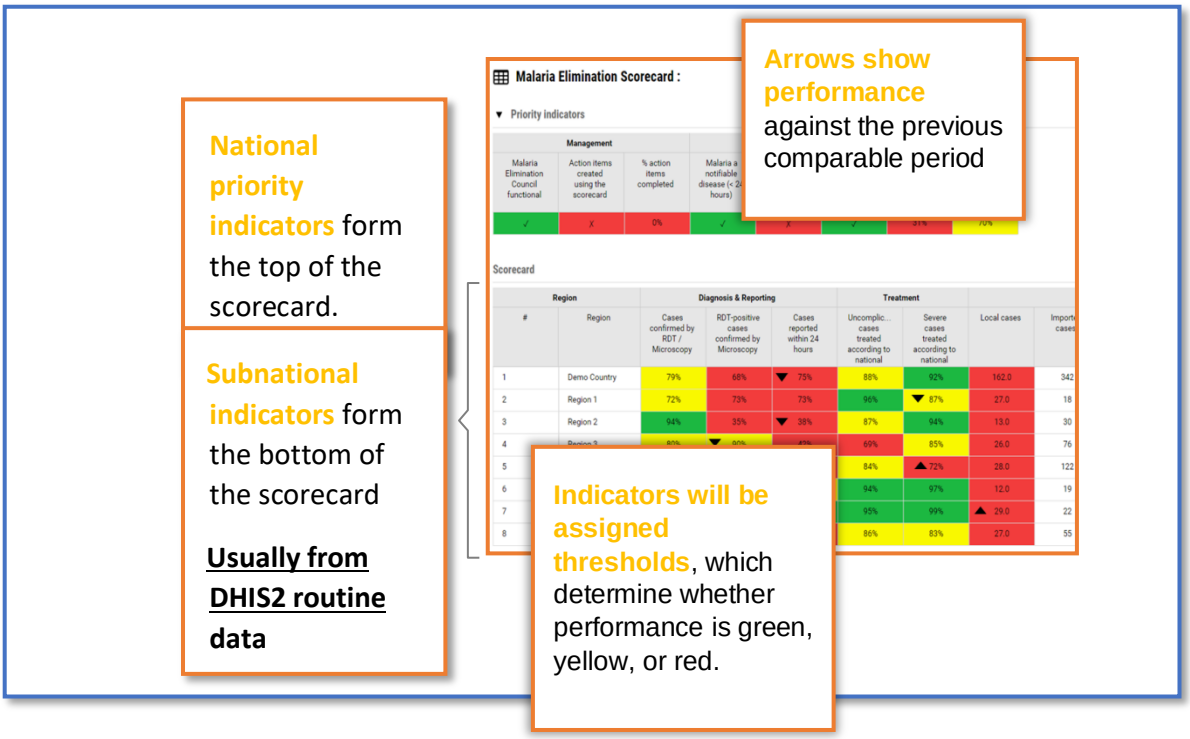
Figure 18: Structure of Malaria dashboard within DHIS 2




### 3.4.2 Malaria Scorecard

The Tanzania Malaria Scorecard is the tool designed for accountability and action. It aims at making malaria indicators a priority tool available to leaders and decision makers for action. It is linked to the country's DHIS2.

Figure 19: The malaria scorecard: national and subnational priority indicators




### 3.4.3 Dissemination Plan

The ultimate goal of any information generated is to be disseminated to improve the knowledge about malaria and its control in the country at all levels. NMCP plans to do it through a series of initiatives within and outside the country to improve knowledge and skills on data use and analysis. It is imperative for NMCP to increase its current capacity in terms of staffing, competencies, and adequate information technology solutions. Implementing partners, especially those from Local Government Authority, will be involved in the process through specific initiatives in the respective administrative areas. Communities also will be informed and involved in the planning through using appropriate channels. **Table 8** is summarizing the information dissemination plan.

Table 8: Dissemination Plan

| Product | Frequency | Responsible | Contents | Audience |
|---|---|---|---|---|
| **Tanzania Public Health Bulletin** | Semi-annual | NMCP SME unit | Service provision; policy and surveys updates | Malaria partners, health workers, |
| **Mass Media update, press release** | Semi-annual | NMCP SBCA and SME units | Policy and services update | Mass media, public |
| **Fact sheets** | Annual | NMCP SBCA and SME units | Policy and services update | General Public |

| Product | Frequency | Responsible | Contents | Audience |
|---|---|---|---|---|
| **Malaria epidemiological profile** | Semi-annual | NMCP and research partners | Updated malaria risk maps | MOH, Malaria stakeholders |
| **Summary DHIS2 updates** | Quarterly | NMCP SME unit | Table, charts and maps | MOH, Malaria stakeholders |
| **Malaria Programme Review** | Mid and end of Malaria Strategic Plan | NMCP and partners | MSP implementation status | MOH, Malaria stakeholders |
| **Operational research abstract book** | Annual | SME-TWG/SME-N | Abstract book / presentation | MOH, Malaria stakeholders |
| **Malaria SME network** | Semi-annual | SME unit | Meeting minutes / presentations | NMCP, Implementing / Research partners |
| **Annual Malaria Review Meeting** | Annual | NMCP | Meeting minutes / presentations | RHMT, CHMT |
| **RMO/DMO annual conference** | Annual | MOH/PORALG | Conference proceedings | RMOs, DMOs |
| **Global and Regional meetings** | Annual | NMCP | Meeting presentations | NMCP staff |
| **National Scientific conferences** | Annual | Research Partners | Abstract book | Researchers and public health professionals |
| **International Scientific Conference (ASTMH, ECTMIH)** | Annual | Research and Academia Partners | Abstract book | Researchers and public health professionals |
| **Web site** | Monthly | NMCP | Web site | Health professionals, general public |

## 3.5 From Knowledge to Evidence

### 3.5.1 Operational Research

The NMCP supports and leads numerous research studies across Tanzania, some of which are led by partner organizations or research bodies, and others designed and managed in house. SME plan is a key platform to develop the malaria operational research agenda as there is almost always a monitoring, evaluation, and surveillance component to the studies. Furthermore, the metrics measured by operational research studies will often inform or support other SME plan efforts. The NMCP's role in operational studies is largely to:

- Establish the research agenda for all studies such that it aligns with the 2021 – 2025 strategic plan
- Translate research findings into practice (policy and guidance) and
- Disseminate information and conclusions from the research study

The following research agenda (**Table 9**: Operational Research Areas) is updated on an ongoing basis as prioritized in the current plan (2021 – 2025).

Table 9: Operational Research Areas

| Study Area | Description of Research Study |
|---|---|
| Dynamic epidemiological profile | Tanzania has a high level of heterogeneity in term of malaria transmission. Geo-located malaria prevalence data and malaria interventions are linked to several variables such as altitude, rainfall, vegetation index, demography to provide geographical description of malaria risk at national, regional, district and sub district level. Updated epidemiological profile is needed to select appropriate operational strata to target effective malaria control interventions |
| Transmission dynamics, stratification and operational implications | In Tanzania there are different transmission intensity areas with different response to control initiatives. Persistent hyper endemic and holo endemic areas should be deeply investigated to describe the determinants of malaria transmission and provide information for the formulation of appropriate-effective-evidence based control initiatives |
| Socio-economic determinants of malaria transmission | Housing, wealth and education are related to malaria prevalence in the communities. Usually there is a direct relation between high prevalence and low education and wealth levels of the communities. A better description of the relation between socio-economic status and malaria transmission are necessary to design appropriate control initiatives |
| Climate determinants of malaria transmission in relation to outbreaks | Actual rainfall and temperature data are useful to predict the start of malaria transmission and to anticipate abnormal malaria transmission in case of excessive precipitations and temperatures. Operationalization of MEEWS should be explored and eventually disseminated |
| Malaria epidemiology and its control in urban setting | Urban areas in Tanzania stand alone in relation to malaria transmission dynamics and malaria control interventions. Apart from some knowledge of vector bionomics in high anthropized settings and different socio-economic background of populations living in urban areas, little is known about malaria transmission and effective control in those areas. Since increased urbanization is a consolidated trend in Tanzania, more operational elements of malaria transmission and related control interventions need to be explored. |

- ***Health System***

| Study Area | Description of Research Study |
|---|---|

| | |
|---|---|
| Availability, Accessibility, Acceptability, Affordability, Delivery, Readiness, and Utilization of Malaria Services | Effective delivery of malaria test and treatment depends on a number of factors that might affect the timely and quality services. The factors related to health care service delivery should be described and mapped to select appropriate interventions. The stratification for providing quality care for uncomplicated and severe malaria is needed through improvement of the entire health system and to provide an answer to the underserved and out of reach sections of the population. |

- ***Multi-Sectoral Collaboration***

| Study Area | Description of Research Study |
|---|---|
| Evidence of Non-Traditional Interventions for Malaria Control | Housing improvement and environment management are unexploited areas that need to be taken on board for addressing sustainable malaria control initiatives. Innovative interventions are needed to be explored and best practices to be disseminated. |

- ***Vectoral Control***

| Study Area | Description of Research Study |
|---|---|
| Insecticide Resistance Testing | See Section 3.2.3 |
| New technologies | NMCP will partner with research institutions to research on the efficacy of new vector control tools and share evidence at relevant fora. Current ongoing researches include field trials of durable wall linings and LLINs with synergists. When and if applicable, new vector control tools will be piloted and assessed for scale-up. |
| Outdoor biting control | The current implemented vector control initiatives, mainly based on indoor measures, might not be enough to shrink further malaria transmission due to potential threat of outdoor biting. New technologies to control outdoor biting need to be introduced and are expected to be critical in controlling residual transmission, especially in low endemicity areas |
| Monitoring vector dynamics in relation to intervention | Collateral and complementary studies to the national malaria vector control surveillance (see Routine Vector Control Monitoring Information System page) |

- ***Malaria Case Management***

| **Study Area** | **Description of Research Study** |
|---|---|
| Therapeutic efficacy studies | See section 3.2.4 |
| Preventive therapies for risk groups | Seasonal Malaria Chemoprevention (SMC), infant and child preventive therapies (IPTi, IPTsc), Mass Screening and Testing (MSAT), Mass Drug Administration (MDA) are major areas that need more evidence for an eventual inclusion into the recommended malaria strategies in the country. |

| | |
|---|---|
| Development and introduction of a malaria vaccine | RTS,S vaccine is expected to be introduced in the country. Evidence based approaches including operationalization in suitable transmission areas need to be explored. Operational research for other potential vaccines trials are also recommended. |
| Quality of care for malaria case management and appropriate management of fever | In the current epidemiological transition quality management of malaria cases is of paramount importance as well as a critical process on diagnosis and treatment of non-malarial febrile conditions. Professional skills and practices should be improved. |
| Monitoring quality of malaria diagnostics and introduction of new diagnostic tools | Alternative diagnostics tools and algorithms – for malaria and other febrile conditions - need to be introduced and tested in different transmission areas.<br>Quality of malaria diagnosis remains central in the management of malaria. Several challenges have been observed such standardization of procedures and performances, quality assurance of test devices and laboratory reagents should be addressed. |
| Monitoring SP resistance markers | SP is still the recommended medicine for IPTp but concerns about its efficacy is hampering the potential benefits. The molecular markers of SP resistance need to be monitored in the community. |
| Efficacy of ITPp (SP) in low transmission settings | WHO recommends the use of IPTp mainly in mesoendemic areas. Its efficacy in hypoendemic areas is not well described. More evidence is needed to inform the NMCP on where the intervention is needed and when the intervention might be safely scaled down. |
| Introduction of PQ-Alu combination in low transmission settings | Malaria epidemiological profile is showing areas where transmission is at a level that Primaquine (PQ) might be effectively introduced to reduce further malaria transmission by using its gametocytocidal effect. |
| Alternative community-based case management | Operationalization of iCCM needs more evidence-based interventions in identified hard to reach areas. Appropriate quality control of procedures and logistics management options should be tested. |

## 3.6 From Evidence to Decision

### 3.6.1 Comprehensive malaria surveillance and response framework

Surveillance is strictly linked with response. Each element of the surveillance framework will generate an alert if an abnormal situation or rupture of equilibrium occurs, or it is likely to occur. In case of disease surveillance the abnormal situation could be an incipient malaria outbreak and the immediate response will be investigation and containment of the epidemic. For programmatic surveillance the abnormal situation is critical low stock of antimalarials and the immediate response

will be the mobilization of contingency stocks or redistribution of existing stock. The parasite and vector surveillance are supposed to detect critical level of resistance to medicines or insecticide respectively. The response will be guided by change in therapeutically regimen or resistance mitigation.

The information generated through malaria surveillance and response is important for:

- Identifying areas and populations most affected by malaria and directing resources to populations most in need
- Identifying trends in cases and deaths that require additional specific control interventions
- Assessing if the interventions directed to control malaria have achieved the desired impact (evaluation of the program)
- Determine occurrence of a malaria epidemic and to monitor its evolution

## 3.7 From Decision to Impact

Over the past decades, as the country through NMCP was deploying malaria control interventions in a similar approach across all the regions regardless of burden level, the NMCP continued to strengthen its Malaria surveillance system, and in alignment with the Global Technical Strategy for Malaria of 2016-2030, in 2018 stratified the country based on malaria transmission risk and identified four epidemiological strata; very low, low, moderate and high. After stratification of malaria transmission risk now the country is implementing targeted interventions. Malaria stratification will be conducted regularly to guide intervention targeting. Furthermore; following stratification that was conducted in 2020 three regions of Kilimanjaro, Arusha and Manyara were hearmarked to start implementation of malaria Case based Surveillance (mCBS).

# CHAPTER 4: IMPLEMENTATION ARRANGEMENTS AND SME STRATEGY

## 4.1 The scope and roles of the SME partners

The NMCP is committed to provide quality, affordable, effective and efficient malaria health services to all Tanzanian citizens. In order to track these benefits a strong SME unit within the program is needed to enable more evidence-based decision-making and to provide implementation accountability.

**The role and scope other MoH sections**

NMCP will work closely with the relevant MoH sections delegated to collect, manage and analyze information:

- The backbone of the malaria information system is the service provision data generated by daily by health facilities through HMIS tools and later entered into the DHIS2 on monthly basis.
- mHealth initiatives are to be strengthen and expanded in collaboration with the responsible MoH section.
- eIDSR platform will be leading the implementation of malaria surveillance for areas with Very low and Low malaria transmission risk (MEEDS and mCBS ) under NMCP oversight.

Other important malaria related data managed by other MoH sections include:

- Pharmaceutical and supply information that is collected through the initiative of the Logistic Management Unit (LMU) of the PSS, Pharmacy Council, TMDA and MSD.
- Comprehensive diagnostics information, currently managed by the DSS, will be linked to DHIS2 platform.

**The role and scope Ministries, Departments and Agencies (MDAs)**

NMCP will facilitate other ministries to perform initiatives related to collection and interpretation of malaria data:

- National Bureau of Statistics (NBS) will lead the implementation of national representative surveys such as DHS, MIS, SPA, HBS and National census. NMCP will support NBS in the preparatory phase including orientation of the field staff and in the dissemination of findings.
- Tanzania Meteorological Agency will lead the collection, analysis and dissemination of weather information related to malaria transmission, especially on producing a platform able to inform the malaria community on early warning for abnormal transmission.

### The role and scopes of research institutions

The country has reputable and capable research institutions. This is a valuable asset to produce continuous information needed for creating evidence on malaria control interventions.

- Entomological monitoring including IRT (TPRI, IHI, NIMR, KCMC)
- Parasitological monitoring including TES (MUHAS, IHI, NIMR, KCMC, CUHAS)
- Quality assurance of NMCP led initiatives (SMPS, MVS, etc)
- Implementation of the priority malaria research agenda (see Operational Research section)

Several international research institutions have been active for decades in Tanzania to conduct high-level operational research. NMCP will encourage these institutions to continue their activities in the country and to technically support the national research institutions.

### Role and scope of PO-RALG

Tanzania's public health system operates at the national (strategy and policy making), regional (technical advice and capacity building) and district (coordination and supervision of implementation) levels. Delivery of health services is shared among the MoH and PO-RALG. Consultant hospitals, zonal health training centers and special programs fall directly under the MoH. PO-RALG manages RHMTs and Council health services, including CHMTs, District hospitals, Health centres and Dispensaries. PO-RALG through the department of Health, Social welfare and Nutrition will be responsible to coordinate the implementation of malaria control SME activities / interventions at Regional and Council level.

### The role and scope of Regional and Councils Health Management

The RHMT and CHMT are playing an enormous role in this SME plan as both the originator of large amount of data and the ultimate users of the information. Regional and district teams are accessing the DHIS2 and other web-based outputs (e.g. eIDSR, eLMIS, ILS and gateway) for simplified analysis and interpretation of data.

### The role and scopes of development and implementing partners

All development and implementing partners are committed to support NMCP in both implementing control initiatives and collecting data to monitor and evaluate the progress towards achieving the goal and objectives set out in the strategic plan.

Development partners have an enormous role in funding the implementation of the major SME initiatives through the support to HMIS/DHIS and implementation of national representative surveys through the NBS. Implementing partners usually give special attention to M&E in their initiatives through dedicated information management initiatives and are paying attention to innovative and creative approaches. NMCP will

encourage a full integration of their implementing modalities within the comprehensive SME framework presented in this plan.

**The role and scopes of the private sector**

Private sector plays a crucial role in delivery of both preventive and curative malaria services. Dedicated information system should be adopted to monitor the delivery of these services. Currently there is a gap of knowledge in the services rendered in some of the informal sector outlets. Particular attention will be paid to collecting accurate and timely information from:

- Manufacturers and first line buyers of diagnostics and medicines
- ADDO and other private outlets
- Commercial net manufacturers and distributors and
- Net retailers

## 4.2 SME governance and networking

The Surveillance, Monitoring and Evaluation (SME) Task force will oversee all technical activities and facilitate-decision making based on the available evidence. The SME Task force will be a small, yet pro-active, group of individuals with expertise in epidemiology, biostatistics, health information systems and entomology. The NMCP SME unit will be the delegated secretariat of the SME Task force. The SME-Task Force

- Will be comprised of approximately 15 individuals from partner organizations with relevant technical skills who are nominated by the SME Network (and confirmed by the NMCP Secretariat). All members of the Task force must agree to prioritize their attendance at all meetings that will be held on quarterly basis and whenever deemed necessary.
- The Task force will work closely with the NMCP to oversee the implementation of the SME Plan 2021 – 2025.
- Other Activities of the Task force include:
- Advising the NMCP as to optimal structure of the SME cell within the NMCP
- Develop standards and guidance for reporting of malaria SME data by partners
- Review of SME data on a regular basis to assess trends in malaria intervention coverage, malaria morbidity and mortality and coverage of other child survival programs
- Provide guidance for malaria surveillance
- Set operations research priorities
- Review of relevant information needed by the NMCP management to inform decision-making
- Provide advice and guidance to the SME cell of NMCP for programme-based evaluation processes
- Provide advice and guidance to the SME cell on routine data collection and periodic surveys for evidence-based decision making

The SME Task force will ensure the following main areas of work are done:

- Involvement in planning, monitoring and reporting of SME activities.
- Discussion of the annual work plans during the NMCP strategic planning process

- Keeping abreast of the progress of the planned SME interventions
- Assessment of the need for corrective measures to achieve targets set in annual plans.
- Strengthening of an integrated system for malaria surveillance
- Enhancement of surveys and operational research

The Surveillance, Monitoring and Evaluation Network is the broad umbrella group comprised of representatives of all partners. The SME Network will:

- Meet biannually to discuss SME activities and report about the SME plan implementation.
- Nominate individuals to serve on the Task force
- Support NMCP to use SME information for evidence-based planning and to promote advocacy for resource mobilization.

## 4.3 SME Activities 2021 – 2025

The key objectives of NMCP's SME strategy for the next five years (2021 – 2025) have been outlined under section 1.8: Goal of Malaria Surveillance, Monitoring and Evaluation. Outlined below are the activities that will allow NMCP to achieve each of the three SME objectives.

| |
|---|
| **Objective 3.1 – Routine Reporting: Strengthen comprehensive malaria surveillance and response in health facilities for improved programmatic performance** |
| ***Activity 3.1.1: Strengthen malaria surveillance and response across all epidemiological strata by improving the use of quality routine HMIS malaria data to generate reliable malaria indicators*** |
| **Situation:** Regardless of transmission intensity, all health facilities (Public and Private) reports monthly malaria data through DHIS2 system. Monthly counts of malaria cases and deaths captured through the system are used to determine trends over time, geographical distribution of malaria and to detect malaria outbreaks for action. Also malaria commodities data reported through the system is used to assess availability / stock out of the commodities and facilitate planning to ensure universal access to malaria prevention, diagnosis and treatment at all health |

facilities. In recent years there have been innovations of developing a Malaria Services and Data Quality Improvement (MSDQI) tool to support tracking the provision of malaria services in health facilities and assess the quality of malaria data generated. MSDQI has recently been updated to electronic form and it focuses on six areas that include OPD, Laboratory, RCH, Pharmacy, malaria testing using mRDT and Microscopy. Data generated through MSDQI is important for program implementation efficiency and re-programming. Data is also monitored through other routine meetings. Three routine indicators are used to develop the epidemiological information for sratification.

**Policy guidance:** National surveillance guideline recommends surveillance across all points as a means to reduce transmission intensity.

**Strategic direction:** Availability of quality data can only be achieved through constant monitoring and support to health facilities which are the units of service data collection in the country thus strengthen malaria surveillance for monitoring progress and guiding the informed decision making is critical.

**Deliverables:** Use of quality routine HMIS malaria data to generate reliable malaria indicators is improved in all public and private Health facilities.

**Output Indicator**: Proportion of health facilities visited for MSDQI assessed for DQA

| **Malaria risk** | |
|---|---|
| Very Low<br>Low | Routine HMIS is recommended in association with immediate and weekly reporting where mCBS and MEEDS are eligible |
| Moderate<br>High | Routine HMIS is the principle surveillance reporting system |
| Urban | According to epidemiological strata |

***Activity 3.1.2: Strengthen capacity for malaria epidemics detection, investigation and containment at Council and health facility level in epidemic prone areas***

**Situation:** Currently the systems expected to detect epidemics through weekly reporting of malaria cases within the IDSR is not enough specific and sensitive to capture outbreak alerts. Malaria epidemics are mainly investigated after being reported outside the information system by community leaders, healthcare workers and community members.

**Rationale:** Timely detection, investigation, confirmation and response to an outbreak reduces the morbidity and mortality and prevents its further spread thus repositioning of malaria in the IDSR to enable timely detection of malaria outbreaks in epidemic prone areas is important.

**Policy Guideline:** The International Health Regulation (IHR), stipulates that disease outbreak investigation and response are among surveillance core capacities that need to be strengthened at all levels.

**Strategic Direction:** Due to the current malaria epidemiological transition, it is expected that more areas in Tanzania will become unstable for malaria

transmission, hence prone to insurgence of outbreaks. To ensure early detection and containment of malaria outbreaks there is a need of strengthening outbreak detection and response capacities at all levels

**Deliverables:** capacity for malaria epidemics detection, investigation and containment will be strengthened in all 32 councils in low transmission areas

**Output Indicator** (see performance framework for more details): Proportion of epidemic alerts investigated within two weeks of onset

| **Malaria risk** | |
|---|---|
| Very Low | Recommended in association with CBS where eligible |
| Low | Highly recommended due to malaria transmission instability |
| Moderate<br>High<br>Urban | Not recommended in normal circumstances, it might be recommended in selected epidemiological sub-districts level according to micro stratification |

***Activity 3.1.3: Implementation of a system for case based surveillance to support elimination interventions in very low malaria transmission risk areas***

**Situation:** 36 (19.6%) of all councils in Mainland Tanzania are in very Low transmission risk epidemiological strata consistently demonstrating less than 1% prevalence and a very low case load of less than 15 malaria cases per 1000 population per annum making them eligible for Case Based Surveillance (CBS) towards elimination. 17 Councils of Arusha, Manyara and Kilimanjaro regions have been selected to start implementation of mCBS in year 2021, and additional seven (7) Councils of Njombe and Iringa regions to start implementation in year 2022. NMCP in collaboration with partners has established a system for implementation of mCBS by the eligible Councils. A mCBS protocol, training manual and electronic notification system for immediate case notification have been developed. Also RHMT, CHMT and health facility staff from 17 Councils from Arusha, Manyara and Kilimanjaro regions have been oriented on mCBS implementation. During mCBS implementation the implementing Health facilities will provide immediate notification of passively detected cases, conduct active follow up of the cases to household level, screen and test all household contacts whether symptomatic or asymptomatic and provide treatment to those found to be positive. For areas that will persistently be reporting cases focus investigation and response will be conducted.

**Policy guidance:** Global Technical Strategy for malaria 2016 - 2030 stipulates that it is necessary to investigate individual cases of infection or clusters of cases in order to understand risk factors and eliminate foci of transmission.

**Strategic direction:** Due to increase of the population living in very low risk transmission risk areas there is need to implement Case based surveillance for all Councils with very low transmission risk

**Deliverables:** Malaria case based surveillance to support elimination interventions implemented in 27 Councils with very low malaria transmission risk.

| | |
|---|---|
| **Output Indicator** (see performance framework for more details): Proportion of malaria cases targeted for follow that have been investigated in Councils implementing CBS | |
| **Malaria risk** | **Service Delivery Mechanism according to risk** |
| Very Low | CBS will be implemented by councils with very low malaria transmission risk |
| Low | CBS might be applied in subset of this stratum according to micro planning following identification of stabilized very low transmission |
| Moderate | Not Applicable |
| High | Not Applicable |
| Urban | This is not an epidemiological but an operational stratum. This stratum includes all Municipals and City councils that belong to either of the four epidemiological strata depending on the malaria transmission risk. The procedures will be as similar as other councils in the very low malaria strata |
| **Objective 3.2 – Periodic Surveys: Strengthen malaria framework for collecting, processing and storing essential indictors from periodic service delivery initiatives and programmatic surveys in the communities.** | |
| ***Activity 3.2.1: Coordinate and conduct representative population surveys according to SME plan*** | |
| **Situation:** Demographic and health survey that usually include a malaria indicator survey module **(**TDHS-MIS) and stand-alone MIS aim to ascertain the progress of malaria control by monitoring parasite and anemia prevalence in under five children and the main programmatic outcomes. TDHS-MIS are conducted after every five years while stand-alone MIS are performed just in between. The results of the surveys are used to set strategic plan targets and to monitor the progress towards their achievement. The National Bureau of Statistics (NBS) is the delegated authority endorsed to plan, collect, analyses and disseminate the data.<br><br>NMCP is coordinating and leading the implementation of school malaria parasitological survey (SMPS) that provides malaria council representative parasitaemia prevalence of public primary school children aged 5- 16 years countrywide. Its statistical power is able to inform malaria prevalence up to sub council levels and is a basis for monitoring and updating malaria stratification. It is conducted biennially (last one conducted in 2019).<br><br>Geo coded prevalence data points from the two surveys are incorporated, together with other prevalence data from research institutions and other partners, into the national parasite prevalence database that is used to generate updated high definition malaria risk maps (and trends) starting from 1990[12]. This geo-spatial model is also providing reference data for the ward level micro-stratification. | |

[12] NMCP, Inform, Kemri. Epidemiological Profile of Malaria and its control. 2013

**Policy guidance:** According to the ending malaria supplementary plan and SME plan; malaria prevalence among children under-fives and school age children is the overarching goal for the program to inform its progress towards malaria elimination.

**Strategic direction:** Program will continue to collaborate with NBS to conduct DHS - MIS and will continue to undertake SMPS after every two years.

**Deliverables:** The two periodic national representative surveys (TDHS-MIS and SMPS) will generate impact and outcome indicators to monitor malaria control interventions.

**Output Indicator**: Number of TDHS-MIS and SMPS conducted.

***Activity 3.2.2: Strengthen longitudinal vigilance of malaria parasitaemia in sentinel population: Pregnant women at ANC***

**Situation:** Longitudinal studies of malaria parasitaemia in sentinel population (pregnant women) are conducted to determine the prevalence of malaria in the group and guide informed interventions. Malaria prevalence among pregnant women is captured on monthly basis through HMIS/DHIS in all health facilities providing ANC services. ANC positivity rate is among the indicators used for national council and ward based micro stratification.

**Policy guidance:** WHO through GTS document recommends routine monitoring of malaria parasites for early detection of infection to eliminate all parasites from humans

**Strategic direction:** NMCP will continue to monitor malaria parasitaemia in pregnant women to continuously monitor the impact of malaria initiatives, generate indicators for micro stratification at sub district level and guide policies.

**Deliverables:** Pregnant women tested for malaria during their first ANC attendance

**Output Indicator**: Proportion of pregnant women tested for malaria parasite during first ANC visits

***Activity 3.2.3: Conduct standard antimalarial Therapeutic Efficacy Study (TES) in sentinel sites as per WHO standard protocol***

**Situation:** The NMCP and its implementing partners has been conducting TES to monitor the efficacy and safety of recommended antimalarials drugs among children of 6 months to 10 years. This include; measures of clinical and parasitological efficacy, differentiate recrudescence from new infection and evaluate incidence and severity of adverse effects. In addition, molecular markers associated with tolerance/resistance is ascertained. Currently there is eight country representative sentinel sites which are monitored for two years; four sites each year. TES is coordinated by NMCP and implemented by five partner institutions namely; MUHAS, IHI, KCMC, CUHAS, and NIMR.

**Rationale:** TES has been an informative tool for drug change policy in the country.

**Policy guidance:** WHO Global technical strategy for malaria 2016-2030 recommends continued performing of antimalarial drugs therapeutic efficacy to detect unexpected adverse events and reduced efficacy to guide policy change.

**Strategic direction**: NMCP will continue to coordinate the implementation of TES

**Deliverables:** Anti-malarial therapeutic efficacy profile will guide the selection of the recommended first line antimalarial

**Output Indicator** (see performance framework for more details): Number of anti-malarial therapeutic efficacy studies conducted annually

***Activity 3.2.4: Strengthen longitudinal monitoring of mosquito population dynamics in the sentinel sites***

**Situation**: A total of 62 sentinel districts have been identified for Malaria Vector Surveillance (MVS) representing all mainland Tanzania regions (at least two councils from each region). Every sentinel district is expected to avail monthly mosquito samples totaling twelve per year. However; samples are collected by NMCP in collaboration with PO-RALG and implementing partner institution (NIMR Muheza) on quarterly basis. Analysis of the submitted samples is conducted at NIMR Muheza and report is submitted to NMCP.

**Rationale:** The Entomological Inoculation Rate (EIR) indicator is the overarching goal to monitor the performance of the current Malaria Strategic Plan (2021 - 2025).

**Policy guidance:** WHO through Global Technical Strategy (GTS) document recommends routine collection of impact and coverage indicators for malaria vector control within the national surveillance systems including all transmission settings including malaria free areas

**Strategic direction**: NMCP will continue to conduct Malaria Vector Surveillance in collaboration with implementing institutions

**Deliverables:** Entomological Inoculation Rate (EIR) generated by the national representative entomological surveillance will be used to monitor the intensity of malaria transmission in all epidemiological strata

**Output Indicator:** Proportion of sentinel districts with monthly mosquito samples submitted to NIMR during the reporting period

***Activity 3.2.5: Strengthen longitudinal monitoring of efficacy and effectiveness of insecticides in national representative sentinel sites***

**Situation:** A total of 28 sentinel sites have been identified in the country to monitor Insecticide Susceptibility Testing (IST). This activity is conducted by NIMR - Muheza / Mwanza to provide NMCP with information on the efficacy of insecticides used in LLINs and IRS.

**Policy guidance:** WHO through GTS document recommends routine collection impact and coverage indicators for malaria vector control within the national surveillance systems including all transmission settings including malaria free areas.

**Strategic direction:** NMCP will continue to collaborate with partner institutions to monitor insecticide susceptibility in the country.

**Deliverables**: Insecticide Susceptibility Test outcomes from the national representative sites will monitor the degree of insecticide resistance to guide the selection of insecticides for IRS according to the national plan for insecticide resistance mitigation

**Output Indicator**: Proportion of sentinel sites submitting all reports according to plan

***Activity 3.2.6: Coordinate the collection, analysis, interpretation and use of the programmatic monitoring of vector control initiatives (including LLINs, IRS and LSM) data.***

**Situation**: Monitoring of vector control initiatives is conducted to assess effectiveness and facilitate vector control planning. Data of distribution of LLINs to pregnant women, under five years' children and school children is collected via HMIS, BEMIS systems. IRS and LSM data is obtaining through monthly RHMT reports.

**Policy guidance:** WHO through its Guidelines for laboratory and field-testing of long-lasting insecticidal nets (2013) and Test procedures for Insecticide resistance monitoring in malaria vector control (June 2018) recommends programmatic monitoring of malaria vector control initiatives for informed policy.

**Strategic direction**: NMCP will continue to collect, analyze and use vector control information for informed decision.

**Deliverables:** Bio-assay studies will be used to monitor the effectiveness of indoor malaria vector performances of IRS and LLIN

**Output Indicator**: Number of bio-assay studies conducted annually

***Activity 3.2.7: Establish capacity for malaria related molecular surveillance for programmatic monitoring of parasites and vector dynamics***

**Situation:** Currently, there is limited evidence on the status of HRP2 gene deletions, antimalarial resistance markers (SP, ACT) in the country.

**Rationale:** Capacity for malaria related molecular surveillance will enable the country to do the following analyses: Resistance markers for antimalarial drugs, Parasite density and speciation, Parasite genotype (migration, importation), Gene deletion and Hematological parameters. This analysis will inform the country on refining its policy on the type of diagnostic tests and antimalarial drugs recommended.

**Policy guidance:** WHO-GMP through its response plan to pfhrp2 gene deletion (2019) advice countries to use existing avenues to monitor presence of gene deletions. The NGMDT&PT indicate a list of markers to be monitored including hrpt2/3 gene deletion, SP and ACT resistance markers, parasite genetics dynamics, parasite speciation, hematological parameters.

**Strategic direction:** Availability of routine dried blood spots (DBS) from school surveys and therapeutic efficacy studies will enable NMCP and its partner institutions to conduct such analysis.

**Deliverables**: capacity for malaria related molecular surveillance for programmatic monitoring of parasites and vector dynamics will be established using appropriate and up to date technical options (e.g. sequencing).

**Output Indicator**: Surveys performed using in-country processed molecular data.

**Objective 3.3 - Evidence-Based Decision Making: Strengthen a comprehensive malaria strategic information system to generate knowledge for evidence-based planning and decision making at all levels**

***Activity 3.3.1: Conduct a comprehensive periodic stratification of malaria transmission risk in all councils for improved targeting of interventions***

**Situation:** NMCP started implementing stratification of malaria burden by council in 2018 and update it in 2020. This approach was adopted to enable targeting interventions and fasten reduction of the malaria burden in the country. In 2020 the country started to develop the methodology to reach sub-council level micro-stratification.

**Policy guidance:** WHO recommends stratifying malaria interventions according to risk. This is well elaborated in the Global Technical Strategy (GTS) and High Burden and High Impact (HBHI) documents.

**Strategic direction:** Tanzania will continue to monitor malaria councils and wards malaria risk. This will facilitate efficient use of limited resources and hasten reduction of malaria prevalence towards elimination by 2030 as stipulated in the GTS. Malaria risk strata maps will be updated every after three years at mid and end time of NSP to define strategic targets and assign recommended interventions. Every year the status of the council malaria risk will be updated to monitor the progress towards the achievements of the set targets.

**Deliverables**: all councils will be able to generate sub-district malaria risk micro stratification maps, interpret them and plan evidence based targeted malaria interventions.

**Output Indicator** (see performance framework for more details): Proportion of councils able to generate micro stratification maps, interpret them and plan evidence based targeted malaria intervention

***Activity 3.3.2: Strengthen malaria data management capacity and the national repository arrangements to enable evidence-based decision making at all levels***

**Situation:** It has been a longstanding challenge at NMCP on obtaining non-routine data. Availability of non-routine has been limited to individual computers/laptops and/or institutions. Hence, its availability much relies on which information is required and which institutions owns it. There have been data right issues including not sharing before publication. To address this, NMCP developed a composite database which collects all non-routine information through different forms depending on the services rendered. Institution which is delivering particular service is the one which is responsible to enter their data. Data required is at aggregated level which still provides a room for implementing institution not sharing its raw data. Unfortunately, the system still works offline due to some operational challenges (server, subdomain) which are being addressed by NMCP, M&E section and ICT at the MoH.

**Rationale**: Availability of malaria repository database to capture all non-routine malaria information is key towards effective and efficiency use of malaria data from all possible sources for decision making.

**Policy guidance:** The SME plan recommend availability of malaria repository database to capture all non-routine malaria information

**Strategic direction:** Establishment of repository malaria database with interactive dashboard is expected to enhance NMCP capacity with readily available outputs. This include charts, maps, graphs, tables and implementation report. Triangulation of these information will accelerate efforts on data use for better programmatic direction.

**Deliverables**: the national malaria data repository system will enable evidence-based decision making at all levels by using the functional web-based NMCP composite database and NMCP-DHIS2 interactive dashboard. The M&E system for the innovative interventions will be included in the strategic information framework.

**Output Indicator**: Availability of updated and functional web-based NMCP composite database and DHIS2 interactive dashboard able to accommodate malaria indicators for all malaria interventions including the new ones

***Activity 3.3.3: Undertake periodic malaria program reviews and evaluation of the implementation of malaria strategic plan***

**Situation:** Malaria Program Performance Reviews (MPR) and Medium Term Review (MTR) are conducted periodically to assess the performance of the program in between and after every end of the Strategic Plan. The purpose is facilitate ascertaining actual performances, challenges experienced and recommendations. MPR and MTR reports have been used to update malaria NMCP strategies and objectives during the development of the Strategic Plans. The last MPR was conducted in February 2020.

**Policy guidance:** WHO recommends routine reviews malaria programs for monitoring analysis of trends to guide informed policy direction.

**Strategic Directions**: NMCP will continue conduct MPR and MTR to guide informed strategies and policy direction.

**Deliverables**: malaria program review will be conducted at the mid-term point in 2023 and at the end point in 2025 to evaluate the implementation of malaria strategic plan.

**Output Indicator**: MPR and MTR reports availability.

***Activity 3.3.4: Create conducive environment for continuous collaboration with research, academia institutions and research capacities at subnational levels to facilitate evidence based decision making at all levels.***

**Situation:** Coordination of NMCP and research/academia institutions to identify and implement malaria research agenda is limited. This frequently leads to less involvement of key NMCP persons on the relevant expertise area. Also at Regional and Council level there is limited use of data as RMFP and DMFP do not conduct operational research to determine the causes of the observed disease burden trends within their respective regions and councils.

**Rationale:** To enhance NMCP involvement and being informed on malaria research priorities; it is critical to have a focal point to coordinate all operational activities implemented by both NMCP and partner institutions

**Policy guidance:** WHO recommendations inform the NMCP together with the findings of implementation operational researches.

**Strategic direction:** Identification of malaria priorities facilitates translation and dissemination of its findings which in turn support evidence-based decision making.

**Deliverables**: Regional and councils will be able to identify malaria related risk factors in the respective areas and to plan appropriate interventions according to the findings.

**Output Indicator**: Proportion of operational research conducted as per SME plan

## 4.4 Implementation Timeline and Action Plan

The implementation plan attached under **APPENDIX 3: IMPLEMENTATION PLAN**, identifies the key objectives and supporting activities previously identified in this section. The implementation plan also highlights when they will occur, as well as the party responsible for implementation and the source of funding.

## 4.5 Budgeting

The NMCP business plan for the period 2021-2025 is indicating a total need for the implementation of this SME plan of USD 57,531,098. Through GOT and development partners a total of USD 26,649,296 is expected to be mobilized , leaving a gap of USD 30,881,802. For more details see **APPENDIX 4: SME BUDGET, 2021 – 2025**.

# APPENDIX 1: Performance Framework For Monitoring 2021-2025 Malaria Strategic Plan Activities

***NMSP Goal***

| Goal | Impact Indicator | Indicator definition | Appropriateness of the indicator: | Malaria risk | Baseline 2019 | Mid Target 2023 | End Target 2025 | Source |
|---|---|---|---|---|---|---|---|---|
| The national goal is to reduce the average malaria prevalence in children aged less than 5 years (*pfpr*$_{6-59}$) from 7% in 2017 to less than 3.5% in 2025. | Malaria prevalence in children aged less than 5 years (pfpr$_{6-59}$) | **Numerator:** Number of children aged less than 5 years positive for malaria parasites<br>**Denominator:** Number of children tested | The indicator reflects the level of malaria transmission. It is monitored through national representative surveys every after 2-3 years. Seasonality and biased survey procedures might affect the results | National | 7.3% | 5.0% | 3.5% | TDHS/ MIS |
| | | | | Very Low | 0.4% | 0.2% | 0.0% | TDHS/ MIS |
| | | | | Low | 1.0% | 0.5% | 0.3% | TDHS/ MIS |
| | | | | Moderate | 6.7% | 3.5% | 1.5% | TDHS/ MIS |
| | | | | High | 14.6% | 7.5% | 3.5% | TDHS/ MIS |
| | | | | Urban | NA | NA | NA | TDHS/ MIS |
| The reduced transmission is expected to decrease the annual parasite incidence (API) from an average of 122 per 1000 in 2019, to less than 30 per 1000 in 2025. | Annual parasite incidence | **Numerator:** Malaria confirmed patients detected<br>**Denominator:** Population at risk per 1000 | **Appropriateness of the indicator:** The indicator reflects the burden of malaria disease. It is monitored annually through routine HMIS. Access to HF and reporting rate might affect the results | National | 122 | 60 | 30 | DHIS2 |
| | | | | Very Low | 6 | 3 | 1 | HMIS/ DHIS |
| | | | | Low | 24 | 12 | 6 | HMIS/ DHIS |
| | | | | Moderate | 124 | 60 | 30 | HMIS/ DHIS |
| | | | | High | 259 | 125 | 60 | HMIS/ DHIS |
| | | | | Urban | 49 | 25 | 12 | HMIS/ DHIS |

| Integrated Malaria Vector Control | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 1. Strategic Objective | Impact Indicator | Indicator Description | Appropriateness of the Indicator | Malaria risk | Baseline 2020 | Mid Target 2023 | End Target 2025 | Source |
| Reduce malaria parasites transmission by maintaining recommended evidence-based vector control interventions according to the targeted malaria risk strata | Annual Entomological Inoculation Rate (EIR) | Formula<br>The product of human biting rate (HBR) multiplied by Plasmodium falciparum sporozoite positive rate (PfSR) from the caught mosquitoes and the 365 days in a year. | EIR It is a proxy indicator for malaria transmission risk. The indicator measures the number of infective bites received per person in a given limit of time in a human population. | National | 2.90 | 1.00 | 0.10 | NMIR / NMCP |
| | | | | Very Low | 0.13 | 0.12 | 0.10 | |
| | | | | Low | 0.60 | 0.30 | 0.10 | |
| | | | | Moderate | 2.90 | 1.00 | 0.10 | |
| | | | | High | 2.90 | 1.00 | 0.10 | |
| | | | | Urban | 0.13 | 0.12 | 0.10 | |
| 1.1 Strategic Approach | Outcome Indicator | Indicator Description | Appropriateness of the Indicator | Malaria risk | Baseline 2020 | Mid Target 2023 | End Target 2025 | Source |
| | | Numerator | | National | 63% | 80% | 95% | MIS |

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| Ensure universal access to LLINs according to malaria transmission settings | | Proportion of the household population with access to an LLIN within their household (assuming one LLIN for every two people in a household) | No individuals who could sleep under LLIN if each LLIN in the household were used by two people<br>Denominator<br>Number of individuals who spent the previous night in the surveyed households | Population access to a LLINs is a representative indicator for population access to a LLINs. It assumed that household population could sleep under a LLINs if every LLIN in the household were used by two people. It is a proxy indicator for LLINs use in the household. | Very Low<br>Low<br>Moderate<br>High<br>Urban | 60%<br>57%<br>62%<br>64%<br>72% | 80%<br>80%<br>80%<br>80%<br>80% | 85%<br>85%<br>85%<br>85%<br>85% | |
| 1.1 | Service Delivery Mechanism | Output Indicators | Indicator Description | Appropriateness of the Indicator | Malaria risk | Baseline 2020 | Mid Target 2023 | End Target 2025 | Source |
| 1.1.1 | Implement a targeted mass replacement campaign when required according to accessibility and epidemiological risk | LLIN distributed through targeted replacement campaigns (cumulative) | Numerator<br>Cumulative number of LLINs Distributed through mini (targeted) MRC<br>Denominator<br>NA | It measures programme performance and population access to a LLINs and it is a representative indicator for population access to a LLINs. It is a proxy indicator for LLINs use in the household. | National<br>Very Low<br>Low<br>Moderate<br>High<br>Urban | NA<br>NA<br>NA<br>NA<br>NA<br>NA | 3M<br>TBD<br>TBD<br>TBD<br>TBD<br>TBD | 5.3M<br>TBD<br>TBD<br>TBD<br>TBD<br>TBD | NMCP Composite Database |
| 1.1.2 | Implement school net programme LLIN (SNP) distribution to keep up LLIN coverage in the general population | LLINs distributed through Schools (cumulative) | Numerator<br>Cumulative number. of LLINs distributed through schools<br>Denominator<br>NA | It measures programme performance and population access to a LLINs and is a representative indicator for population access to a LLINs. It is a proxy indicator for LLINs use in the household. | National<br>Very Low<br>Low<br>Moderate<br>High<br>Urban | 1.3M<br>NA<br>0<br>1,253,300<br>336,669<br>0 | 13.5M<br>NA<br>2,168,955<br>3,997,044<br>6,069,507<br>1,272,216 | 22.7M<br>NA<br>3,655,890<br>6,737,233<br>10,230,482<br>2,144,388 | NMCP Composite Database |
| 1.1.3 | Implement LLIN distribution through RCH to protect biological vulnerable groups, infants | Proportion of infants provided with LLINs during MR1 vaccine &<br>Proportion of pregnant women provided with LLINs during first ANC | Numerator<br>No. of infants received LLINs during Measles/Rubella vaccine & No. of pregnant women | It measures increase nets coverage and raise population access of LLINs, representative indicator for population access to a LLINs. It is a proxy indicator for | National | 78% (Infants)<br>88% (PW) | 100% (Infants)<br>100% (PW) | 100% (Infants)<br>100% (PW) | HMIS/ DHIS2 |

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| | and pregnant women, and to keep up net coverage in the general population | | received LLINs during first ANC<br>Denominator<br>No of infants provided with MR1 vaccine &<br>No of pregnant women attended first ANC. | LLINs use in the household. | | | | | |
| 1.1.4 | Implement LLIN alternative delivery system to special population groups and special situation | LLINs distributed through alternative channel. | Numerator<br>Number of LLINs distributed through alternative channels<br>Denominator<br>NA | It measures increase nets coverage and raise population access of LLINs, representative indicator for population access to a LLINs. It is a proxy indicator for LLINs use in the household. | National | NA | 100% | 100% | NMCP Reports |
| 1.1.5 | Create enabling environment for LLINs availability in commercial market. | Proportion of LLINs distributed through commercial channels | Numerator<br>Number of LLINs distributed through commercial channels<br>Denominator<br>Total LLINs distributed through different channels | It measures increase nets coverage and raise population access of LLINs, representative indicator for population access to a LLIN. .It is a proxy indictor for LLINs use in the household. | National | 10% | 13% | 15% | MIS |
| 1.2 Strategic Approach | | Outcome Indicator | Indicator Description | Appropriateness of the Indicator | Malaria risk | Baseline 2020 | Mid Target 2023 | End Target 2025 | Source |
| Consolidate and expand IRS in epidemiologically and operationally suitable areas | | Percent of house structures in the country sprayed with recommended insecticide(s) during the past 12 months | Numerator<br>Number of house structures sprayed with recommended insecticides during the past 12 month<br>Denominator<br>Number of targeted sprayable structures in the eligible councils found in the country. | The indicator provides the national coverage of houses structures sprayed for IRS in all 61 eligible councils. | National | 3% | 25% | 25% | NMCP Reports |
| 1.2 | Service Delivery Mechanism | Output Indicators | Indicator Description | Appropriateness of the Indicator | Malaria risk | Baseline 2020 | Mid Target 2023 | End Target 2025 | Source |
| 1.2.1 | Create an enabling | Number of councils planned using | Numerator | | National | 6 | 30 | 61 | |
| | | | | | Very Low | NA | NA | NA | |

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| | environment to plan, implement and conduct quality IRS by using community engagement including guidelines, training packages, monitoring system, environmental compliance, pesticide management plan | updated guidelines, SOPs, training packages, proper monitoring and environmental compliance during quality IRS implementation. | This is the number of councils planned using updated guidelines, SOPs, training packages, proper monitoring and environmental compliance during quality IRS implementation. | The indicator indicates the preparedness for delivery IRS services | Low | NA | NA | NA | Malaria composite database |
| | | | Denominator | | Moderate | NA | NA | NA | |
| | | | NA | | High | 6 | 30 | 61 | |
| | | | | | Urban | NA | NA | NA | |
| 1.2.2 | Build capacity of council (CHMT) and private sector to plan, manage, implement, and evaluate IRS. | Proportion of eligible Councils with capacity to plan, manage, implement and evaluate IRS | Numerator | The indicator takes into consideration councils eligible for IRS | National | 26 | 26 | 36 | Malaria composite database |
| | | | | | Very Low | NA | NA | NA | |
| | | | Number of councils capacitated to implement quality IRS with recommended insecticide. | | Low | NA | NA | NA | |
| | | | Denominator | | Moderate | NA | NA | NA | |
| | | | Number of councils eligible for IRS in the country | | High | 26 | 26 | 36 | |
| | | | | | Urban | NA | NA | NA | |
| 1.2.3 | Application of targeted IRS through community participation and engagement in the high malaria risk councils with resilient malaria transmission as malaria burden reduction and | Proportion of house structures sprayed through community participation and engagement | Numerator | The indicator takes into consideration number of councils implementing IRS through community participation and engagement | National | 98% | 98% | 98% | Malaria composite database |
| | | | House structures sprayed through community participation and engagement | | | | | | |
| | | | Denominator | | | | | | |
| | | | House structures eligible for spraying through community participation and engagement | | | | | | |

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| | insecticide mitigation tool | | | | | | | | |
| 1.2.4 | Application of focal IRS as a response to residual malaria transmission in the very low malaria risk councils targeting elimination | Proportion of investigated eligible transmission foci implementing focal IRS | Numerator<br>Foci with implemented focal IRS<br>Denominator<br>Number of foci identified eligible for focal IRS | The indicator monitor capacity to implement focus investigation and response | Very Low | NA | 25% | 50% | CBS information system |
| 1.3 Strategic Approach | | Outcome Indicator | Indicator Description | Appropriateness of the Indicator | Malaria risk | Baseline 2020 | Mid Target 2023 | End Target 2025 | Source |
| Implement appropriate, sustainable and quality Larval Source Management (Larviciding, Environmental Management and Biological control) interventions in suitable epidemiological and operational areas | | Proportion of larval density reduced in sentinels councils implementing biolarviciding | Numerator<br>Number of larval collected after application of biolarviciding<br>Denominator<br>Number of mosquito larval collected before application of biolarviciding | The indicator measure the reduction of larval density as a contribution to interruption of malaria transmission | National | NA | 50% | 75% | Malaria composite database |
| 1.3 | Service Delivery Mechanism | Output Indicators | Indicator Description | Appropriateness of the Indicator | Malaria risk | Baseline 2020 | Mid Target 2023 | End Target 2025 | Source |
| 1.3.1 | Create an enabling environment to plan, implement quality LSM in targeted areas | Proportion of sentinel councils implementing LSM able to monitor and report larval density | Numerator<br>sentinel councils implementing LSM able to monitor and report regularly larval density<br>Denominator | The indicator monitor the preparedness to deliver quality LSM in targeted areas | National | 0 | 62 (100%) | 62 (100%) | NMCP Reports |

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| | by using community engagement (guidelines, training packages, monitoring system, environmental compliance, biolarviciding management plan). | | sentinel councils implementing LSM | | | | | | |
| 1.3.2 | Build capacity of Council (CHMT) and private sector to plan, manage, implement, and evaluate LSM | Number of targeted councils supervisors trained to implement effective bio-larviciding | Numerator<br>No. of cities and municipal councils implemented bio-larvicides<br>Denominator<br>Total number of cities and municipal councils targeted for bio- larvicides | | National | Not Available | 25 | 25 | PO-RALG |
| 1.3.3 | Application of appropriate, sustainable and quality bio-larvicides according to guidelines and standard operating procedures | Proportion of identified breeding sites treated with quality bio-larviciding according to SOP | Numerator<br>No of identified breeding sites treated with quality bio-larviciding according to SOP<br>Denominator<br>Number of identified breeding sites | Implementation of LSM according to guidelines is the basic requirement for quality larviciding operations | National | NA | 80% | 90% | PO-RALG |
| 1.3.4 | Create partnership to ensure that environmental related elements of LSM are part of community based, councils and | Proportion of environmental Impact assessment/audit approved in infrastructure/development projects which included requirement for diseases vector control. | Numerator<br>Approved environmental impact assessment/audit report(s) with requirements for disease vector control<br>Denominator<br>Number of EIA submitted to NEMC | The indicator monitors the multi-sectoral engagement in reducing larval habitats | National | NA | 80% | 90% | NEMC Report |

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| | private sector LSM plans | | | | | | | | |
| 1.4 Strategic Approach | | Outcome Indicator | Indicator Description | | | | | | |
| Provide a strategic framework for coordination and continuous assessment for the implementation of evidence-based Vector control innovations | | Number of new innovative evidence-based vector control tool introduced and adopted for malaria vector in Tanzania | Numerator<br>Number of innovative tools adopted<br>Denominator<br>NA | This indicator addresses challenges of insecticides resistance, enhance effectiveness of vector intervention tools | National | 2 | 2 | 5 | NMCP Reports |
| 1.4 | Service Delivery Mechanism | Output Indicators | Indicator Description | Appropriateness of the Indicator | Malaria risk | Baseline 2020 | Mid Target 2023 | End Target 2025 | Source |
| 1.4.1 | Encourage partners to research and develop evidence for novel vector control tools for scale up in the country. | Number of new innovative vector control tools piloted in the country (cumulative) | Number of new novel vector control tools piloted | This indicator monitor practical solutions for mitigating or preempting insecticides resistance, and provides way forward to effectiveness of vector intervention tools | National | 1 | 2 | 4 | NMCP Reports |
| 1.4.2 | Implementation of Insecticide Resistance Management plan | Number of insecticides molecules with different mode of action used for IRS/LLIN per year | Numerator<br>Number of insecticides molecules with different mode of action used for IRS/LLIN per year<br>Denominator<br>1 | This indicator it indicates types of insecticides with different mode of action used for IRS/LLIN in the attempt to mitigate development of resistance | National | 2 (PBO/Sumishield) | 1 | 1 | NMCP Reports |
| **Malaria Diagnosis, Treatment and Preventive Therapies** | | | | | | | | | |
| 2. Strategic Objective | | Impact Indicator | Indicator Description | Appropriateness of the Indicator | Malaria risk | Baseline 2020 | Mid Target 2023 | End Target 2025 | Source |
| To prevent the occurrence of mortality related to malaria infection through universal access to appropriate diagnosis and treatment and targeted provision of | | Malaria Mortality rate in Health facility per 100,000. | Numerator<br>Number of death due to malaria being underlying cause.<br>Denominator | Avoiding unnecessary deaths is the primary objective of improved malaria case management services. | National<br>Very Low<br>Low<br>Moderate<br>High | 4 per 100,000<br>0.6<br>1.0<br>5.8<br>5.6 | 3 per 100,000<br>0.3<br>0.5<br>3.0<br>3.0 | 1 per 100,000<br>0.0<br>0.0<br>2.0<br>2.0 | HMIS/ DHIS2 |

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| preventive therapies for vulnerable groups | | | Number of population at risk | | Urban | 4.3 | 2.0 | 1.0 | |
| 2.1 Strategic Approach | | Outcome Indicator | Indicator Description | Appropriateness of the Indicator | Malaria risk | Baseline 2020 | Mid Target 2023 | End Target 2025 | Source |
| Provide universal access to appropriate, quality and timely treatment to all people with malaria. | | % of U5 children with fever who had a malaria test the same or next day after onset of a disease | Numerator | This indicator is a standardized globally recognized indicator for assessing access to test services | National | 43% | 75% | 85% | MIS |
| | | | | | Very Low | 33% | 70% | 85% | |
| | | | < 5children who tested for malaria the same or next day after onset of a disease | | Low | 15% | 70% | 85% | |
| | | | Denominator | | Moderate | 46% | 70% | 85% | |
| | | | <5children with history of fever in the two weeks prior the survey | | High | 52% | 70% | 85% | |
| | | | | | Urban | 69% | 75% | 85% | |
| 2.1 | Service Delivery Mechanism | Output Indicators | Indicator Description | Appropriateness of the Indicator | Malaria risk | Baseline 2020 | Mid Target 2023 | End Target 2025 | Source |
| 2.1.1 | Provide high-standard, accessible, affordable, equitable, and quality-assured malaria testing services for people seeking treatment in the public health sector. | Proportion of malaria cases tested in the public healthcare delivery sector out of total OPD visits (testing ratio) | Numerator | Testing ratio is a proxy indicator of malaria testing. It has been selected due to the impossibility to use suspect malaria as denominator | National | 51% | 60% | 70% | HMIS/ DHIS2 |
| | | | | | Very Low | 20% | 40% | 50% | |
| | | | OPD cases tested for malaria in public health facility | | Low | 29% | 50% | 60% | |
| | | | Denominator | | Moderate | 57% | 75% | 75% | |
| | | | OPD cases attended in public health care delivery | | High | 70% | 75% | 80% | |
| | | | | | Urban | 42% | 75% | 75% | |
| 2.1.2 | Facilitate the provision of high-standard, accessible, affordable, and quality-assured testing to people seeking treatment in | Proportion of malaria cases tested in the private healthcare delivery sector out of total OPD visits | Numerator | Testing ratio is a proxy indicator of malaria testing. It has been selected due to the impossibility to use suspect malaria as denominator | National | 59% | 65% | 70% | HMIS/ DHIS2 |
| | | | | | Very Low | 42% | 45% | 50% | |
| | | | OPD cases tested for malaria private health care in delivery | | Low | 56% | 60% | 65% | |
| | | | Denominator | | Moderate | 73% | 75% | 80% | |
| | | | | | High | 69% | 75% | 80% | |

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| | the private sector | | OPD cases attended in private health care deliver | | Urban | 56% | 75% | 75% | |
| 2.1.3 | Facilitate the provision of high-standard, accessible, affordable, and quality-assured testing to patients seeking treatment fever managements beyond the operational health facilities | Proportion of malaria tests performed in community outlets (ADDO and mCCM) | Numerator<br>Number of malaria tests performed in community outlets (ADDO and mCCM)<br>Denominator<br>Total number of reported malaria tests | This indicator will monitor the additional value of community based testing as an attempt to reach universal access to malaria diagnostics | National | NA | 20% | 30% | HMIS/<br>DHIS2 |
| 2.1.4 | Provide quality-assured and quality control in all malaria testing services | Proportion of health facilities scored above 75% of TAQC services with RDT | Numerator<br>Number of Health Facilities scoring above 75% in TAQC assessment<br>Denominator<br>Number of Health Facilities assessed for TAQC | The indicator monitors mentoring and coaching activities during routine assessment | National | 14% | 75% | 85% | HMIS/DHIS2 |
| 2.1.5 | Introduce evidence-based, innovative diagnostic tools/system for malaria detection and differential diagnosis of other pathogens causing febrile illnesses | Number of initiatives introducing evidence based innovative diagnostics tools | Numerator<br>Number of innovative diagnostics tools introduced<br>Denominator<br>Number of innovative diagnostics tools | The indicator monitors the preparedness of the health system to improve diagnostic capability | National | NA | 1 new diagnostic tool | 2 new diagnostic tool | NMCP<br>Reports |
| 2.2 Strategic Approach | | Outcome Indicator | Indicator Description | Appropriateness of the Indicator | Malaria risk | Baseline 2020 | Mid Target 2023 | End Target 2025 | Source |
| | | | Numerator | | National | 35% | 40% | 50% | MIS |

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| Provide universal access to appropriate, quality and timely treatment to all people with malaria | | % children under 5 with fever who were treated with recommended antimalarial the same or next day following the onset of fever | Children with fever who received recommended antimalarial the same or next day. | Children under five years of age is a representative vulnerable group to assess the access to appropriate, quality and timely treatment. The indicator is usually measured in national and regional representative household surveys (MIS) every 2-3 years. | Very Low | 2% | 10% | 20% | |
| | | | | | Low | 27% | 40% | 50% | |
| | | | Denominator | | Moderate | 35% | 45% | 50% | |
| | | | Children under age of 5 with fever who were treated the same or next day following the onset of fever | | High | 45% | 60% | 70% | |
| | | | | | Urban | 21% | 40% | 50% | |
| 2.2 | Service Delivery Mechanism | Output Indicators | Indicator Description | Appropriateness of the Indicator | Malaria risk | Baseline 2020 | Mid Target 2023 | End Target 2025 | Source |
| 2.2.1 | Provide highly efficacious, accessible, affordable, equitable, and quality-assured antimalarial to patients seeking treatment in the public sector | Proportion of malaria confirmed patients dispensed with a QAACT in public health facilities | Numerator | The output indicator intends to measure the accountability of antimalarial use in the public sector | National | 1:1.2 | 1:1 | 1:1 | HMIS/ DHIS2 |
| | | | | | Very Low | 1:3 | 1:1.5 | 1:1 | |
| | | | Malaria confirmed cases received QAACT in public health facility | | Low | 1:2 | 1:1.5 | 1:1 | |
| | | | Denominator | | Moderate | 1:1 | 1:1 | 1:1 | |
| | | | Malaria confirmed cases in public health facility | | High | 1:1 | 1:1 | 1:1 | |
| | | | | | Urban | 1:1 | 1:1 | 1:1 | |
| 2.2.2 | Facilitate the provision of accessible, affordable, and quality-assured antimalarial to patients seeking treatment in the private sector | Proportion of malaria confirmed patients dispensed with a QAACT in private health facilities | Numerator | The output indicator intends to measure the accountability of antimalarial use in the private sector | National | 1:9 | 1:1 | 1:1 | HMIS/ DHIS2 |
| | | | | | Very Low | 1:1.7 | 1:1 | 1:1 | |
| | | | malaria confirmed cases received QAACT in private health facility | | Low | 1:2 | 1:1 | 1:1 | |
| | | | Denominator | | Moderate | 1:1.5 | 1:1 | 1:1 | |
| | | | malaria confirmed cases in private health facility | | High | 1:0.8 | 1:1 | 1:1 | |
| | | | | | Urban | 1:1.1 | 1:1 | 1:1 | |
| 2.2.3 | Facilitate the provision of high-standard, | Proportion of patients treated within the mCCM framework | Numerator | mCCM framework is expected to report through DHIS2. The | National | NA | 5% | 10% | HMIS/ DHIS2 |
| | | | Patients treated within the mCCM framework | | | | | | |

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| | accessible, affordable, and quality-assured management to patients seeking treatment beyond the operational health facilities in identified suitable operational areas | | Denominator<br><br>Malaria positive patients detected within the mCCM framework | outputs will be visualized in the malaria interactive framework | | | | | |
| 2.2.4 | Provide high-quality severe malaria management services by skilled providers in public, private and community. | Malaria Case fatality rate | Numerator<br><br>Number of deaths reported in health facilities attributed to malaria<br><br>Denominator<br><br>Number of severe malaria admissions reported in the same facilities | CFR is an useful indicator to monitor appropriateness of severe malaria case management within the health facilities | National<br>Very Low<br>Low<br>Moderate<br>High<br>Urban | 0.6%<br>0.6%<br>0.6%<br>1.0%<br>0.8%<br>0.7% | 0.5%<br>0.5%<br>0.5%<br>0.8%<br>0.7%<br>0.6% | 0.4%<br>0.4%<br>0.4%<br>0.6%<br>0.6%<br>0.5% | HMIS/<br>DHIS2 |
| 2.3 Strategic Approach | | Outcome Indicator | Indicator Description | Appropriateness of the Indicator | Malaria risk | Baseline 2020 | Mid Target 2023 | End Target 2025 | Source |
| Provide appropriate and effective services to reduce the risk of malaria infection and its complications among populations biologically and socioeconomic vulnerable to malaria. | | % of women with live birth in the previous two years who received two doses or more of SP (IPTp3+) | Numerator<br><br>Number of live birth in the previous two years who received three doses or more of SP (IPTp3+)<br><br>Denominator<br><br>Number of live birth in the previous two years. | This is a coverage indicator measuring the proportion of ANC reached with IPTp3 in delivering the service | National<br>Very Low<br>Low<br>Moderate<br>High<br>Urban | 26%<br>30%<br>20%<br>25%<br>30%<br>42% | 70%<br>70%<br>70%<br>70%<br>70%<br>70% | 85%<br>75%<br>75%<br>75%<br>75%<br>75% | MIS |
| 2.3 | Service Delivery Mechanism | Output Indicators | Indicator Description | Appropriateness of the Indicator | Malaria risk | Baseline 2020 | Mid Target 2023 | End Target 2025 | Source |

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| 2.3.1 | Increase the uptake of IPTp3+ and CPT among HIV positive pregnant women in health facilities in low, moderate and high transmission areas to reduce vulnerability in pregnancy | % of pregnant women attending ANC who receive IPTp2 and IPTp3 | Numerator | This is a performance indicator measuring the efficiency of ANC in delivering the service | National | 71% | 90% | 95% | HMIS/ DHIS2 |
| | | | | | Very Low | 77% | NA | NA | |
| | | | pregnant women attended ANC who receive IPTp2 and IPTp3 | | Low | 75% | 95% | 95% | |
| | | | Denominator | | Moderate | 71% | 95% | 95% | |
| | | | | | High | 70% | 95% | 95% | |
| | | | pregnant women attended ANC | | Urban | 76% | 95% | 95% | |
| 2.3.2 | Introduce the provision of SP for IPTi during vaccination schedule during infancy in high malaria risk areas | Proportion of infants who received IPT during vaccination schedule in selected epidemiological strata | Numerator | Children aged 3-59 months are the target for the intervention and the intervention coverage will be based on the targeted group | National | NA | 65% | 75% | HMIS/DHIS2 |
| | | | | | Very Low | NA | NA | NA | |
| | | | Infant received IPTi during vaccination schedule in selected epidemiological strata. | | Low | NA | NA | NA | |
| | | | Denominator | | Moderate | NA | NA | NA | |
| | | | | | High | 0 | 65% | 75% | |
| | | | Infant attending on vaccination schedule in selected epidemiological strata. | | Urban | NA | NA | NA | |
| 2.3.3 | Introduce targeted antimalarial preventive therapies to identified vulnerable groups within high malaria risk areas | Proportion of risk group population who received antimalarial chemoprevention among all targeted risk group in selected epidemiological strata | Numerator | Specific risk groups to be targeted will be identified in year 1 of this strategic plan | National | NA | 25% | 50% | NMCP Reports |
| | | | | | Very Low | NA | TBD | TBD | |
| | | | Risk group received chemoprevention among the targeted in epidemiological strata | | Low | NA | TBD | TBD | |
| | | | Denominator | | Moderate | NA | TBD | TBD | |
| | | | | | High | NA | TBD | TBD | |
| | | | Risk group received malaria chemoprevention | | Urban | NA | TBD | TBD | |

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| | | | among the targeted in epidemiological strata | | | | | | |
| 2.3.4 | In the event of the introduction of a malaria vaccine, the country is able to rapidly scale up its use in suitable epidemiological and operational areas | Number of initiatives Vaccine/introduced | Numerator<br>Denominator | The indicator monitors the preparedness of the health system for the introduction of malaria vaccine | Very Low<br>Low<br>Moderate<br>High<br>Urban | 0% | 10% | 20% | HMIS/ DHIS2 |
| 2.4 Strategic Approach | | Outcome Indicator | Indicator Description | Appropriateness of the Indicator | Malaria risk | Baseline 2020 | Mid Target 2023 | End Target 2025 | Source |
| Deploy appropriate malaria case management and preventive therapies interventions in suitable epidemiological and operational areas, in the event of emergency situations, and in peculiar population groups to reduce the risk of severe morbidity and mortality | | Proportion of identified people reached with special/specific initiatives | Numerator<br>Number of identified people reached with special interventions<br>Denominator<br>People identified for special initiatives | This indicator measures the ability to identify risk population in specific situations. The specific targets will be defined after identification. | National | NA | 80% | 80% | NMCP Report |
| 2.4 | Service Delivery Mechanism | Output Indicators | Indicator Description | Appropriateness of the Indicator | Malaria risk | Baseline 2020 | Mid Target 2023 | End Target 2025 | Source |
| 2.4.1 | Provide appropriate initiatives as response to emergency situation | People treated within 2 weeks from detected and notified malaria epidemics | Numerator<br>Number of People treated within 2 weeks from detected and notified malaria epidemics | The intervention is recommended as an immediate response to a detected outbreak. If no notifications received the indicator will be "0". | National | NA | TBD | TBD | IDSR |

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| | including outbreak | | Denominator<br>NA | Targets over the NMSP are not appropriate | | | | | |
| 2.4.2 | Introduce reactive case detection as part of case based surveillance in identified low transmission areas | Number and proportion of people actively screened | Numerator<br>Number of people screened for malaria<br>Denominator<br>Number of people targeted for active screening | The indicator shows the outputs and magnitudes of screening the targeted intervention done in very low transmission areas. | National | NA | 80% | 80% | NMCP<br>Report |
| 2.4.3 | Introduce the provision of selected diagnosis and treatment approaches for risk mitigation and burden reduction through focal screening and treatment and mass drug administration in suitable epidemiological and operational areas | Proportion of people treated in epidemiological and operational areas identified | Numerator<br>People treated in epidemiological and operational areas identified<br>Denominator<br>People targeted in epidemiological and operational areas identified | The intervention is recommended as an immediate response in identified foci in very low transmission. If no foci are targeted, the indicator will be "0". Targets over the NMSP are not appropriate | National | NA | TBD | TBD | NMCP Composite Database |
| 2.4.4 | Improve malaria case management for specific population groups to be targeted with special initiatives | People from specific population groups treated in identified epidemiological and operational areas | Numerator | The intervention targets identified special population groups and special situations through outreach services. If no identified needs the indicator will be 0. | National | NA | TBD | TBD | NMCP Composite Database |

| Malaria Surveillance, Monitoring and Evaluation | | | | | | | | | |
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| 3. Strategic Objective | | Impact Indicator | Indicator Description | Appropriateness of the Indicator | Malaria risk | Baseline 2020 | Mid Target 2023 | End Target 2025 | Source |
| To provide timely and reliable information on malaria and its control needed to take appropriate actions in different transmission risk and ensure resources are used in the most cost-effective manner | | Proportion of councils with very low malaria transmission risk | Numerator | Increased proportion of councils with very low malaria transmission risk will indicate progress towards achieving malaria elimination. | National | 20% | 25% | 35% | Malaria Stratification Report |
| | | | | | Very Low | 36 (20%) | 25% | 35% | |
| | | | Number of councils with very low malaria transmission risk | | Low | 32 (17%) | 25% | 30% | |
| | | | Denominator | | Moderate | 52 (28%) | 25% | 25% | |
| | | | Number of all councils in mainland Tanzania | | High | 64 (35%) | 25% | 10% | |
| | | | | | Urban | NA | | | |
| 3.1 Strategic Approach | | Outcome Indicator | Indicator Description | Appropriateness of the Indicator | Malaria risk | Baseline 2020 | Mid Target 2023 | End Target 2025 | Source |
| Strengthen comprehensive malaria surveillance and response in health facilities for improved programmatic performance | | Proportion of health facilities scoring 75% and above on data quality according to MSDQI DQA checklist | Numerator | Proportion of health facilities with quality data among the assessed is a proxy of the status of data quality for all facilities in the country. This indicator reflects to what extent our data can be trusted to guide decisions. | National | 65% | 75% | 85% | HMIS/ DHIS2 |
| | | | Number of health facilities scoring 75% and above on data quality according to MSDQI DQA checklist | | | | | | |
| | | | Denominator | | | | | | |
| | | | Number of health facilities assessed on data quality according to MSDQI DQA checklist | | | | | | |
| 3.1 | Service Delivery Mechanism | Output Indicators | Indicator Description | Appropriateness of the Indicator | Malaria risk | Baseline 2020 | Mid Target 2023 | End Target 2025 | Source |
| 3.1.1 | Strengthen malaria surveillance and response across all epidemiological strata by improving the use of quality routine HMIS malaria data to generate reliable malaria indicators | Proportion of health facilities visited for MSDQI assessed for DQA | Numerator | This indicator ascertains the representativeness of the percentage of health facilities reported to have quality data according to MSDQI | National | 27% | 50% | 60% | HMIS/ DHIS2 |
| | | | Number of health facilities visited for MSDQI assessed for DQA | | | | | | |
| | | | Denominator | | | | | | |
| | | | Number of all facilities | | | | | | |
| 3.1.2 | Strengthen capacity for malaria epidemics detection, | Proportion of epidemic alerts investigated within two weeks of onset | Numerator | The indicator measures the sensitivity of | National | NA | 100% | 100% | HMIS/ DHIS2 |
| | | | | | Very Low | NA | NA | NA | |
| | | | Number of malaria outbreak alerts | | Low | NA | 100% | 100% | |

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | investigation and containment at Council and health facility level in epidemic prone areas | | investigated within two weeks of onset | surveillance system in detecting possible outbreaks and the capacity of the health system on outbreak investigation | | | | | |
| | | | Denominator | | Moderate | NA | NA | NA | |
| | | | All malaria outbreaks alerts | | High | NA | NA | NA | |
| | | | | | Urban | NA | NA | NA | |
| 3.1.3 | Implementation of Case Based Surveillance to support elimination interventions in very low malaria transmission risk areas | Proportion of malaria cases targeted for follow that have been investigated in Councils implementing CBS | Numerator | The indicator shows the rate of implementation of CBS in councils with very low malaria transmission risk. | National | NA | 80% | 90% | NMCP Composite Database |
| | | | | | Very Low | NA | 80% | 90% | |
| | | | Number of passively detected malaria cases investigated | | Low | NA | NA | NA | |
| | | | Denominator | | Moderate | NA | NA | NA | |
| | | | Number of targeted passively detected malaria cases | | High | NA | NA | NA | |
| | | | | | Urban | NA | NA | NA | |
| 3.2 Strategic Approach | | Outcome Indicator | Indicator Description | Appropriateness of the Indicator | Malaria risk | Baseline 2020 | Mid Target 2023 | End Target 2025 | Source |
| Strengthen malaria framework for collecting, processing and storing essential indictors from periodic service delivery initiatives and programmatic surveys in the communities | | Proportion of available periodic service delivery and programmatic surveys report | Numerator | This indicator shows the number of surveys conducted within the reporting time against what has been planned according to SME plan. | National | 100% | 100% | 100% | NMCP Composite Database |
| | | | Number of available periodic service delivery and programmatic survey reports | | | | | | |
| | | | Denominator | | | | | | |
| | | | Number of periodic service delivery and programmatic surveys according to SME plan | | | | | | |
| 3.2 | Service Delivery Mechanism | Output Indicators | Indicator Description | Appropriateness of the Indicator | Malaria risk | Baseline 2020 | Mid Target 2023 | End Target 2025 | Source |
| 3.2.1 | Coordinate and conduct representative population surveys according to SME plan | Number of TDHS-MIS and SMPS conducted | Numerator | Conducting the planned number of TDHS-MIS and SMPS is essential in informing the progress towards malaria elimination | National | 3 | 3 | 5 | NMCP Annual Reports |
| | | | Number of TDHS-MIS and SMPS conducted according to SME plan | | | | | | |
| | | | Denominator | | | | | | |
| | | | 1 | | | | | | |
| 3.2.2 | Strengthen longitudinal vigilance of malaria parasitaemia in sentinel population: | Proportion of pregnant women tested for malaria parasite during first ANC visits | Numerator | Information for this indicator is collected through routine system with huge number of data on monthly basis | National | 97% | 99% | 100% | HMIS/ DHIS2 |
| | | | Number of pregnant women tested for malaria parasite during first ANC visits | | | | | | |
| | | | Denominator | | | | | | |

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|---|---|---|---|---|---|---|---|---|---|
| | pregnant women at ANC | | Number of pregnant women attending first ANC visit | | | | | | |
| 3.2.3 | Conduct standard antimalarial Therapeutic Efficacy Study (TES) in sentinel sites as per WHO standard protocol | Number of anti-malarial therapeutic efficacy studies conducted annually | Numerator<br>Number of anti-malarial therapeutic efficacy studies conducted annually<br>Denominator<br>NA | Continuous therapeutic efficacy monitoring regulate the selection of recommended antimalarials | National | 6 | 24 | 36 | NMCP Composite Database |
| 3.2.4 | Strengthen longitudinal monitoring of mosquito population dynamics in the sentinel sites | Proportion of sentinel districts with monthly mosquito samples submitted to NIMR during the reporting period | Numerator<br>Number of sentinel districts with submitted monthly mosquito samples during the reporting period<br>Denominator<br>Number of sentinel districts required to submit mosquito samples | Monitoring number of mosquito samples submitted monthly consecutively from the sentinel districts as elaborated in the Performance Framework is key towards generating EIR indicator | National | | 50% | 75% | NMCP Composite Database |
| 3.2.5 | Strengthen longitudinal monitoring of efficacy and effectiveness of insecticides in national representative sentinel sites | Proportion of sentinel sites submitting all reports | Numerator<br>Number of sentinel sites submitting all required reports<br>Denominator<br>Number of all sentinel sites | Continuous insecticide susceptibility monitoring regulate the selection of recommended chemicals for malaria prevention | National | 100% | 100% | 100% | NMCP report |
| 3.2.6 | Coordinate the collection, analysis, interpretation and use of the programmatic monitoring of vector control initiatives (including LLINs, IRS and LSM) data | Number of bio-assay studies conducted annually | Numerator<br>Number of bio-assay studies conducted per annum as stipulated in the PF<br>Denominator<br>NA | This is crucial indicator to monitor efficacy of insecticidal. This can also be used to monitor wash effect and regeneration time | National | 6 IRS Districts | 8 | 8 | NMCP report |
| 3.2.7 | | | Numerator | | National | NA | 4 | 6 | |

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|---|---|---|---|---|---|---|---|---|---|
| | Establish capacity for malaria related molecular surveillance for programmatic monitoring of parasites and vector dynamics | Number of operational research using in-country processed molecular data | Number of operational research using in-country processed molecular data<br>Denominator<br>NA | Ability to generate molecular surveillance data in country | | | | | Research Reports |
| 3.3 Strategic Approach | | Outcome Indicator | Indicator Description | Appropriateness of the Indicator | Malaria risk | Baseline 2020 | Mid Target 2023 | End Target 2025 | Source |
| Strengthen a comprehensive malaria strategic information system to generate knowledge for evidence-based planning and decision making at all levels | | Continuous availability of uninterrupted interactive web-based system providing non-routine malaria information | Numerator<br>Functional, updated and uninterrupted web-based malaria repository database<br>Denominator<br>NA | Continuous availability of uninterrupted web-based repository database will be proxy to use information for programmatic monitoring | National | 1 | 1 | 1 | NMCP |
| 3.3 | Service Delivery Mechanism | Output Indicators | Indicator Description | Appropriateness of the Indicator | Malaria risk | Baseline 2020 | Mid Target 2023 | End Target 2025 | Source |
| 3.3.1 | Conduct a comprehensive periodic stratification of malaria transmission risk in all councils for improved targeting of interventions | Proportion of councils able to generate micro-stratification maps, interpret them and plan evidence based targeted malaria intervention | Numerator<br>Number of councils able to generate and utilize micro-stratification maps<br>Denominator<br>Number of all councils | Districts able to target intervention according to micro-stratification of malaria risk | National | 100% | 100% | 100% | Malaria Stratification Report |
| 3.3.2 | Strengthen malaria data management capacity and the national repository arrangements to enable evidence-based decision making at all levels | Availability of updated and functional web-based NMCP composite database and DHIS2 interactive dashboard able to accommodate malaria indicators for all malaria interventions | Numerator<br>Functional web-based malaria database with DHIS2 interface<br>Denominator | Existence of malaria database is key towards effective and efficiency use of malaria data from all possible sources for decision making. | National | 1 | 1 | 1 | NMCP report |
| 3.3.3 | Undertake periodic malaria programme reviews and | MPR and MTR reports availability | Numerator<br>Number of reports generated as per PF<br>Denominator | Reports from MPR and MTR are crucial for developing malaria strategies | National | 2 | 1 | 2 | NMCP Reports |

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| | evaluation of the implementation of malaria strategic plan | | | | | | | | |
| 3.3.4 | Create conducive environment for continuous collaboration with research, academia institutions and research capacities at subnational levels to facilitate evidence based decision making at all levels. | Proportion of operational research conducted as per SME plan | Numerator | As proportion increases it indicates the degree of engagement and ownership of subnational levels in malaria control research | National | 0% | 25% | 30% | NMCP Report |

## Commodities and Logistic Management

| 4. Strategic Objective | Impact Indicator | Indicator Description | Appropriateness of the Indicator | Malaria risk | Baseline 2020 | Mid Target 2023 | End Target 2025 | Source |
|---|---|---|---|---|---|---|---|---|
| Maintain timely availability of safe and quality malaria commodities and supplies at the delivery points | Proportion of commodities received as per supply plan | Numerator<br>Quantity of commodity received in reporting period<br>Denominator<br>Quantity of commodities anticipated in the updated supply plan in the reporting period | This indicator is expected to monitor commodities availability. It is highly affected by the availability of funds for procurements | National | 100% | 100% | 100% | Pipelines |
| 4.1 Strategic Approach | Outcome Indicator | Indicator Description | Appropriateness of the Indicator | Malaria risk | Baseline 2020 | Mid Target 2023 | End Target 2025 | Source |
| Promote partnership to ensure malaria commodities are available in all service delivery points in the right amount and when needed | Proportion of facilities/points of care received deliveries within the specified time | Numerator<br>Number of facilities/point of care received deliveries within specified time<br>Denominator | This indicator is important to measure the compliance to the agreed supply plan in order to maintain adequate inventory levels and avoid extra costs related | National | NA | 95% | 100% | epicore9<br>eLMIS |

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| | | | Number of facilities/points of care that placed order during specified time | to emergency procurement and storage | | | | | |
| 4.1 | Service Delivery Mechanism | Output Indicators | Indicator Description | Appropriateness of the Indicator | Malaria risk | Baseline 2020 | Mid Target 2023 | End Target 2025 | Source |
| 4.1.1 | Carry out annual quantification and gap analysis for all malaria commodities and supplies | Updated report with programmatic gap analysis, quantification for malaria commodities and supply plan | Numerator<br>Updated report with programmatic gap analysis, quantification for malaria commodities and supply plan<br>Denominator<br>NA | Continuous availability of commodities depends on the information included into annual quantification report | | | | | |
| 4.1.2 | Provide conducive partnership to properly conduct procurement of malaria commodities and supplies | Proportion of commodities procurement orders initiated in the reporting period according to supply plan | Numerator<br>Commodities procurement orders initiated in the reporting period according to supply plan<br>Denominator<br>Expected number of commodities procurement orders in the reporting period according to supply plan | This indicator monitors if the procurement is done based on the requested quantity, timelines and funding | | | | | |
| 4.1.2.1 | Procurement of antimalarial for treatment of uncomplicated malaria for public and private (CPM) health facilities (timely and effective is required) | Proportion of healthcare facilities reporting no stocks of ALu | Numerator<br>Number of Health Facilities reporting no Alu in stock at the end of the month<br>Denominator<br>Number of Health Facilities eligible to provide Alu | Availability of Alu in HF is related to timely and efficient procurement. This indicator has been used in the past to monitor the efficiency of the procurement | | | | | |
| 4.1.2.2 | | | Numerator | | | | | | |

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|---|---|---|---|---|---|---|---|---|---|
| | Procurement of antimalarial for preventive therapies | Proportion of healthcare facilities reporting no stocks of SP | Number of Health Facilities with no SP in stock at the end of the month<br>Denominator<br>Number of Health Facilities eligible to provide SP. | This indicator will monitor the procurement of antimalarials fior preventive therapies. | | | | | |
| 4.1.2.3 | Procurement of diagnostic test | Proportion of healthcare facilities reporting no stocks of mRDT | Numerator<br>Number of Health Facilities with no mRDT stock at the end of the month<br>Denominator<br>Number of Health Facilities eligible to provide mRDT | This indicator will monitor the efficient of procurement of diagnostics. | National | 2% | <1% | <1% | HMIS/ DHIS2 |
| 4.1.2.4 | Procurement of antimalarial for treatment of severe malaria | Proportion of healthcare facilities reporting no stocks of Artesunate injection | Numerator<br>Number of Health Facilities with available Artesunate injection<br>Denominator<br>Number of Health Facilities eligible to provide Artesunate injection | This indicator will monitor the efficiency of procurement procedures for injectable antimalarials | National | NA | <5% | <5% | HMIS/ DHIS2 |
| 4.1.2.5 | Procurement of LLIN | Proportion of healthcare facilities reporting no stocks of LLIN | Numerator<br>Number of Health Facilities with available LLIN/PBO net<br>Denominator<br>Number of Health Facilities eligible to provide LLIN/PBO net | This is appropriate indicator as it will monitor the efficient of procurement. | National | NA | <5% | <5% | HMIS /DHIS2 |
| 4.1.2.6 | Procurement bio-larvicides | Proportion of bio larviciding received out of the anticipated in supply plan | Numerator<br>Amount of bio larviciding received<br>Denominator<br>Amount of larviciding anticipated in supply plan | This indicator will be used to improve inventory availability, logistics management practices and to monitor the availability of bio larviciding at the points of care | National | NA | 85% | 85% | NMCP Composite Database |

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|---|---|---|---|---|---|---|---|---|---|
| 4.1.2.7 | Procurement of insecticide for IRS | Proportion of insecticides received out of the anticipated in supply plan | Numerator<br>Amount of insecticides received<br>Denominator<br>Amount of insecticides anticipated in supply plan | This indicator will be used to improve inventory availability, logistics management practices and to monitor the availability of insecticides at the points of care | National | 100% | 100% | 100% | IRS contractor report |
| 4.1.3.1 | Enhance supply chain of insecticide treated materials, insecticides and larvicides, from point of entry/supplier to service delivery point. | Proportion of insecticides and bio-larvicides received and delivered by delegated logistic authority (MSD, contractors) according to the pesticide management plan | Numerator<br>Amount of insecticides and bio-larvicides delivered based on distributor information system<br>Denominator<br>Amount of insecticides and bio-larvicides received based on distributor information system | This indicator will be used as proxy to identify and follow up information gaps between supply chain levels and assure commodity accountability. | National | NA | 100% | 100% | Pesticide distribution information system |
| 4.1.3.2 | Enhance supply chain of medicines and diagnostics for malaria case management from point of entry/supplier to health care facilities | Fill rate of requested malaria commodities and supplies | Numerator<br>Amount of commodities received<br>Denominator<br>Amount of commodities requested | This indicator measures the performance of the supplier in meeting the customer requirements. | National | TBD | 100% | 100% | eLMIS |
| 4.1.4 | Enhance logistic management of medicines, diagnostics and other malaria commodities within the health care facilities including dispensing | Proportion of facilities assessed on MSDQI logistic management scoring 75% and above | Numerator<br>Number of facilities assessed on logistic management scoring above 75%<br>Denominator<br>Number of assessed facilities for logistic management | The quality of data to be used for logistic decision making is essential to maintain optimal availability of commodities | National | 61% | 75% | 90% | HMIS/<br>DHIS2 |

| 4.2 Strategic Approach | | Outcome Indicator | Indicator Description | Appropriateness of the Indicator | Malaria risk | Baseline 2020 | Mid Target 2023 | End Target 2025 | Source |
|---|---|---|---|---|---|---|---|---|---|
| Promote partnership to ensure that all malaria commodities used at service delivery points are quality assured | | Proportion of commodities batches tested at port of entry and post market surveillance with quality assurance certification | Numerator<br>Number of commodities batches with quality assurance certification at port of entry and post market surveillance<br>Denominator<br>Number of commodities batches tested at port of entry and post market surveillance | Quality assurance depends on systematic testing of all batches received prior their distribution to point of care | National | 100% | 100% | 100% | TMDA, TPRI, TBS |
| 4.2 | Service Delivery Mechanism | Output Indicators | Indicator Description | Appropriateness of the Indicator | Malaria risk | Baseline 2020 | Mid Target 2023 | End Target 2025 | Source |
| 4.2.1 | To strengthen commodities Port of entry quality check for malaria commodities, vector control and case management | Proportion of malaria commodities batches passed the port of entry quality check | Numerator<br>Number of malaria commodities batches passed the port of entry quality check<br>Denominator<br>Number of malaria commodities batches tested at port of entry | Quality assurance depends on systematic testing of all batches received at the port of entry prior their distribution to point of care | National | 100% | 100% | 100% | TMDA,TBS,TPRI Reports |
| 4.2.2 | Post Market surveillance for antimalarial medicines and malaria testing devices | Proportion of medicine and testing devices that passed the quality check in post market surveillance reports | Numerator<br>Medicine and devices that passed the quality check in post market surveillance reports<br>Denominator<br>Medicine and devices tested in post market surveillance reports | Quality assurance depends on systematic testing at the point of care | National | 100% | 100% | 100% | TMDA PMS Quarterly reports |

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| 4.2.3 | Post Market surveillance for vector control commodities, LLIN, insecticides and larvicides | LLIN durability and efficacy report | Numerator<br>LLIN tested for durability and efficacy<br>Denominator<br>NA | According to quantification assumptions, LLIN are estimated to last and be efficacious for 3 years. Based on the results the assumptions might change | National | xxx | | | NIMR Reports |
| 4.3 Strategic Approach | | Outcome Indicator | Indicator Description | Appropriateness of the Indicator | Malaria risk | Baseline 2020 | Mid Target 2023 | End Target 2025 | Source |
| Promote partnership to ensure that all malaria commodities used at service delivery points are safe | | Malaria commodities evaluated for safety and registered by delegated authorities | Numerator<br>Malaria commodities evaluated for safety and registered by delegated authorities<br>Denominator<br>NA | This indicator is needed to monitor the safety of malaria commodities | National | XXX | TBD | TBD | TMDA Vigflow |
| 4.3 | Service Delivery Mechanism | Output Indicators | Indicator Description | Appropriateness of the Indicator | Malaria risk | Baseline 2020 | Mid Target 2023 | End Target 2025 | Source |
| 4.3.1 | Facilitate the relevant regulatory authorities, TMDA, to conduct passive pharmacovigilance for malaria medicine. | Reported passive adverse events or interactions of antimalarial medicine | Numerator<br>ADR reported for antimalarials<br>Denominator<br>NA | This indicator can be easily accessed through the global electronic platform: VigiFlow information | National | 49% | TBD | TBD | VigiFlow TMDA |
| 4.3.2 | Facilitate the relevant regulatory authorities, NIMR and TPRI, to conduct continuous evaluation use practices and re–evaluation of | Number of products for malaria vector control evaluated and re-evaluated for the safety profile | Numerator<br>Number of product evaluated and re-evaluated for safety<br>Denominator<br>NA | The potential adverse effects of pesticides requires a continuous process of re-evaluation. NMCP should access the TPRI safety reporting | National | NA | TBD | TBD | TPRI Reports |

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| | potentially adverse effects to people and the environment | | | | | | | | |

## Social Behaviour Change & Advocacy

| 5. Strategic Objective | Impact Indicator | Indicator Description | Appropriateness of the Indicator | Malaria risk | Baseline 2020 | Mid Target 2023 | End Target2025 | Source |
|---|---|---|---|---|---|---|---|---|
| To strengthen an enabling environment where individuals at risk from malaria are empowered to protect themselves and their families from malaria and seek proper and timely malaria-treatment | Proportion of parents/caretakers with children under five years old with fever in the last two weeks for whom advice or treatment was sought | Numerator: Number of parents/caretakers who sought advice or treatment for their children under five years of age with fever in the last two weeks<br>Denominator: Number of parents/caretakers of children under five years of age with fever in the last two weeks interviewed during the survey | The proposed indicator intends to measure the self-efficacy of parents/caretakers to perform/take an action of protecting their children | National | 75% | 81% | 85% | MIS |
| 5.1 Strategic Approach | Outcome Indicator | Indicator Description | Appropriateness of the Indicator | Malaria risk | Baseline 2020 | Mid Target 2023 | End Target 2025 | Source |
| Reinforce and update knowledge and practice amongst all community members about appropriate malaria prevention, testing and treatment, promote desired positive behaviors and social norms about healthy behaviours | Proportion of women with knowledge on measures to avoid malaria | Numerator: Number of women with knowledge to avoid malaria Interviewed under the survey<br>Denominator: All women interviewed under the survey | In both of the output indicators women are just representative of assessing the level of malaria knowledge in the population as per MIS | National | 87% | 90% | 93% | MIS |
| 5.1 Service Delivery Mechanism | Output Indicators | Indicator Description | Appropriateness of the Indicator | Malaria risk | Baseline2020 | Mid Target 2023 | End Target2025 | Source |
| 5.1.1 Improve capacity of healthcare workers to effectively provide accurate and relevant | Proportion of health workers trained on providing SBC messages to clients | Numerator: Number of health facilities with healthcare workers providing SBC information with a patient counseling score of above 75% | Measure health workers who provide of malaria messages to patients at OPD and ANC including friendly interaction and is measured through | National | 78% | 80% | 85% | HMIS/ DHIS2 |

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|---|---|---|---|---|---|---|---|---|---|
| | information to patients, pregnant women and caretakers of under-five on desired behaviors for malaria prevention and treatment | | Denominator<br>Number of health Facilities assessed by MSDQI OPD Checklist | counselling section and observation in the MSDQI | | | | | |
| 5.1.2 | Improve capacity of Community Health Workers (CHWs) to effectively provide accurate and relevant malaria information during their interaction with community members | Proportion of CHWs capacitated to implement Interpersonal Communication for Malaria interventions | Numerator<br>Number of oriented CHWs to implement Interpersonal Communication for Malaria<br>Denominator<br>All targeted CHWs | The indicator is appropriate to measure CHWs with capacity to implementation interpersonal communication activities in the community | National | 48% | 60% | 80% | NMCP Report |
| 5.1.3 | Develop and implement mass media campaign with key target audience at different levels using different communication channels to maintain knowledge level and spark actions | Proportion of women reached with appropriate malaria messages through mass media (TV, radio, printed materials & social media) | Numerator<br>Number women Interviewed and reached through mass media with appropriate malaria messages<br>Denominator<br>All women interviewed under survey | Women surveyed are expected to represent the situation of media exposure in the population | National | 78% | 80% | 85% | MIS |
| 5.2 Strategic Approach | | Outcome Indicator | Indicator Description | Appropriateness of the Indicator | Malaria risk | Baseline 2020 | Mid Target 2023 | End Target 2025 | Source |
| Maintain high knowledge and improve good practices amongst vulnerable groups with elevated risk of malaria infection so that they know about their specific risk, prevention and treatment options available to them | | Proportion of women 15-49 years who know pregnant women are at higher risk of getting malaria | Numerator<br>Number of women aged 15-49 who know pregnant women are at higher risk of getting malaria interviewed under the survey<br>Denominator<br>All women interviewed under the survey | This indicator measures the knowledge level of target audience (vulnerable group), on understanding their vulnerability, using women at bearing age as representative | National | 93% | 94% | 95% | MIS |

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| 5.2 | Service Delivery Mechanism | Output Indicators | Indicator Description | Appropriateness of the Indicator | Malaria risk | Baseline 2020 | Mid Target 2023 | End Target 2025 | Source |
| 5.2.1 | Develop and implement SBC outreach programme for marginalized and disadvantaged vulnerable groups in all-malaria transmission areas | Number of SBC outreach events for targeted populations conducted in high-transmission areas | Numerator: Number of SBC outreach events conducted<br>Denominator: NA | This indicator measure the SBC outreach programme developed and implemented to targeted population as a representative of socioeconomic vulnerable groups, hard-to-reach, mobile populations and refugees in high-transmission areas | National | 4938 | 8000 | 12000 | NMCP Reports |
| 5.2.2 | Develop and implement school-based SBC programmes to provide malaria messages | Proportion of schools whose teachers have been oriented on malaria SBC or pupils distributed with SBC materials | Numerator: Number of School with teachers oriented on malaria SBC or pupils distributed with SBC materials<br>Denominator: All schools in the targeted districts/councils | This indicator looks at the extent of malaria school health programme whether to teachers or pupils | National | 0 | 2000 | 3000 | NMCP Reports |
| 5.2.3 | Addressing potential gender-related barriers for uptake of malaria interventions at the household and community level | Number of malaria and gender assessment/studies conducted | Numerator: Malaria-gender studies conducted<br>Denominator: NA | Specific studies will assess barriers to access and use of malaria interventions | National | 0 | 1 | 2 | NMCP Reports |
| 5.3 Strategic Approach | | Outcome Indicator | Indicator Description | Appropriateness of the Indicator | Malaria risk | Baseline 2020 | Mid Target 2023 | End Target 2025 | Source |
| Encourage communities to utilize and implement community-based malaria control initiatives | | % of women who state that malaria is the most serious health risk in the community | Numerator: Number of women who state that malaria is the most serious health risk in the community<br>Denominator: Total population surveyed | Informed community are able to plan and implement effective malaria control interventions | National | 57% | 60% | 80% | MIS |

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| 5.3 | Service Delivery Mechanism | Output Indicators | Indicator Description | Appropriateness of the Indicator | Malaria risk | Baseline 2020 | Mid Target 2023 | End Target 2025 | Source |
| 5.3.1 | Create an enabling environment to establish malaria community based intervention package that include promotion, LSM, mCCM and mCBS (including guideline, training package and M&E supervision systems) | proportion of districts targeted for implementing promotional, vector control or malaria Community Case Management initiatives | Numerator: Council reached with malaria community engagement activities<br>Denominator: All district | This indicator intends to measure councils preparedness to conduct malaria community engagement activities | National | 47% | 50% | 60% | NMCP Report |
| 5.4 Strategic Approach | | Outcome Indicator | Indicator Description | Appropriateness of the Indicator | Malaria risk | Baseline 2020 | Mid Target 2023 | End Target 2025 | Source |
| Strengthen Public Private Partnership to maximize SBC efforts and ensure consistence in fight against malaria | | Proportion of private sector companies that invest in malaria (programmatic or financial) contribution to prevent and control malaria in the community | Numerator: Number of private companies contributing to malaria<br>Denominator: All private organization engaged in the fight against malaria | This indicator intends to measure private companies commitment to fight malaria | National | 23% | 40% | 50% | NMCP Report |
| 5.4 | Service Delivery Mechanism | Output Indicators | Indicator Description | Appropriateness of the Indicator | Malaria risk | Baseline 2020 | Mid Target 2023 | End Target 2025 | Source |
| 5.4.1 | Strengthen existing malaria SBC fora to ensure coordinated and harmonized implementation of the SBC strategy to all implementing partners at all levels including private sector | Number of SBC TWG and harmonization meeting conducted | Numerator: Number of SBC TWG and harmonization meeting<br>Denominator: NA | This indicator measures the number of SBC TWG and harmonization meetings conducted as a way of coordination Implementing partners and private companies with activities and efforts to in the fight against malaria. | National | 4 | 12 | 20 | NMCP Reports |

| 5.5 Strategic Approach | | Outcome Indicator | Indicator Description | Appropriateness of the Indicator | Malaria risk | Baseline 2020 | Mid Target 2023 | End Target 2025 | Source |
|---|---|---|---|---|---|---|---|---|---|
| Increase visibility for specific malaria campaigns to politicians, communities and general public so that malaria become an agenda and priority at all levels | | Percentage of women age 15-49 who have seen or heard malaria campaign messages in the past year | Numerator<br>Women who have seen or heard malaria campaign messages interviewed in the survey<br>Denominator<br>All women interviewed during the survey | This indicator measure the exposure of specific malaria campaign messages to different audience using women as representative | National | 84% | 86% | 88% | MIS |
| 5.5 | Service Delivery Mechanism | Output Indicators | Indicator Description | Appropriateness of the Indicator | Malaria risk | Baseline 2020 | Mid Target 2023 | End Target 2025 | Source |
| 5.5.1 | Strengthening advocacy for malaria to high level leaders, influential people, regional and council leaders to raise the profile of malaria, get support and prioritization of malaria interventions at all levels | Number of advocacy meetings conducted at national, regional and council level | Numerator<br>Number of advocacy meetings conducted at high level leaders, regional and councils<br>Denominator<br>Number of planned advocacy meetings conducted at high level leaders, regional and councils | This indicator expects to monitor awareness of political national, regional & councils leadership on malaria activities | National | 2 | 50 | 100 | NMCP Reports |
| 5.5.2 | Implement specific malaria campaigns to increase visibility | Number of campaign materials disseminated to the targeted audience | Numerator<br>Number of campaign materials distributed<br>Denominator<br>NA | These indicator measures campaign visibility to different target audience | National | 0 | 3000 | 6000 | NMCP Reports |
| **Leadership, Partnership and Resource Mobilization** | | | | | | | | | |
| 6. Strategic Objective | | Impact Indicator | Indicator Description | Appropriateness of the Indicator | Malaria risk | Baseline 2020 | Mid Target 2023 | End Target 2025 | Source |
| To strengthen efficient and effective coordination for implementation of malaria | | Proportion of malaria control service delivery mechanisms | Numerator<br>Number of service delivery mechanisms implemented in the year | This is an ideal way to track the performance on the implementation of planned activities. | National | 63% | 75% | 90% | MTR |

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| strategies through accountable partnership | | implemented annually | Denominator<br>All service delivery mechanisms planned to be implemented in the year | Although some implementations challenges might contribute to the low performance. | | | | | |
| 6.1 Strategic Approach | | Outcome Indicator | Indicator Description | Appropriateness of the Indicator | Malaria risk | Baseline 2020 | Mid Target 2023 | End Target 2025 | Source |
| To provide effective leadership and governance for the implementation of malaria control and elimination interventions at all levels | | Programme performance as rated over time, through periodic semiannual evaluation | Numerator<br>Programme performance rating<br>Denominator<br>NA | The indicator measures the progress of NMSP interventions from baseline to end-line | National | A | A+ | A+ | Evaluation Report of PUDR |
| 6.1 | Service Delivery Mechanism | Output Indicators | Indicator Description | Appropriateness of the Indicator | Malaria risk | Baseline 2020 | Mid Target 2023 | End Target 2025 | Source |
| 6.1.1 | Improve coordination and governance structures at all levels to strengthen coordination, communication, and close follow up of all malaria related interventions | Proportion of governance and technical meetings conducted as per plan | Numerator<br>Number of governance and technical meetings conducted<br>Denominator<br>Number governance and technical meetings planned | Transparent governance and effective technical guidance is essential for implementing appropriate Malaria control intervention. Its coordination will be conducted by holding regular meetings of the established committees. | National | 75% | 90% | 90% | NMCP Reports |
| 6.1.2 | Strengthen and sustain the country with appropriate evidence based malaria control strategy that will guide stakeholders and implementers towards the achievements of its goal | Proportion of updated strategic and technical documents available | Numerator<br>Number of updated strategic and technical guidelines developed<br>Denominator<br>Number of strategic and technical guidelines planned | Policy documents are essential for malaria control interventions | National | 100% | 100% | 100% | NMCP Reports |
| 6.1.3 | | | Numerator | | National | 83% | 100% | 100% | |

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | Strengthen human resources capacity for effective strategic plan implementation at national and LGA levels | Proportion of NMCP and PO-RALG staffing level filled by government as indicated in the organograms | Number of technical staff covered according to NMCP and PO-RALG organograms<br>Denominator<br>Number of technical staff required in the organogram | The government of Tanzania s responsible to ensure appropriate and competent staffing level as stipulated in the respective organograms | | | | | NMCP Staff Plan |
| 6.1.4 | Enhance well structured, coordinated and harmonized supervision and verification system involving implementing entities at various levels | Proportion of regions supervised by national | Numerator<br>Number of regions supervised<br>Denominator<br>All Regions | Supportive supervision is essential to provide quality services and to verify the implementation of interventions | National | 100% | 100% | 100% | NMCP Supervision Reports |
| 6.2 Strategic Approach | | Outcome Indicator | Indicator Description | Appropriateness of the Indicator | Malaria risk | Baseline 2020 | Mid Target 2023 | End Target 2025 | Source |
| implement the malaria strategic plan | | Proportion of domestic funds allocated for malaria interventions. | Numerator<br>Domestic funds allocated for malaria interventions.<br>Denominator<br>Overall malaria interventions budget. | Domestic funding is required to fill the programmatic and financial gaps in the NMSP | National | NA | 25% | 50% | Malaria Business Plan |
| 6.2 | Service Delivery Mechanism | Output Indicators | Indicator Description | Appropriateness of the Indicator | Malaria risk | Baseline 2020 | Mid Target 2023 | End Target 2025 | Source |
| 6.2.1 | Strengthen the resource mobilization mechanisms for sustainable implementation of malaria strategies | Updated resource mobilization plan available | Numerator<br>Resource mobilization plan available<br>Denominator<br>NA | The resource mobilization plan is needed to attract adequate resources, especially domestic, for comprehensive sustainable implementation of the NMSP | National | 1 Draft | 1 | 1 | Govt, MOP, GF, others funding request |
| 6.2.2 | Sustain comprehensive business and operational plans | Updated business and annual operational plan for malaria control | Numerator<br>Business and annual operational plan for malaria control interventions available | The implementation of the NMSP is implemented by using and updating the business plan and the annual operational plans | National | 2 | 2 | 2 | NMCP Reports |

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | for malaria control interventions | interventions available | Denominator<br>NA | | | | | | |
| 6.2.3 | Strengthen NMCP capacity to successfully implement planned malaria intervention at all levels | Adequate technical and logistic equipment in place according to the procurement plan | Numerator<br>Technical and logistic equipment available<br>Denominator<br>Adequate technical and logistic equipment listed in the procurement plan | To increase efficiency NMCP and PO-RALG teams need to work in a conducive environment and be supported with adequate technical and logistic equipment | National | 75% | 90% | 90% | NMCP Reports |
| 6.2.4 | Strengthen the malaria component of annual comprehensive council health plans | Proportion of CCHP with funded malaria component in line with the NMSP | Numerator<br>CCHP with funded malaria component in line with the NMSP<br>Denominator<br>All CCHP | Most of malaria interventions are implemented at Hfs and community levels, thus councils need to include malaria budget in their plans | National | NA | 50% | 75% | NMCP Reports |
| 6.3 Strategic Approach | | Outcome Indicator | Indicator Description | Appropriateness of the Indicator | Malaria risk | Baseline 2020 | Mid Target 2023 | End Target 2025 | Source |
| Promote harmonized multi-sectoral approach and cross-border initiative for malaria control | | Proportion of regional/cross-border and multi-sectoral malaria initiatives implemented | Numerator<br>Regional/cross-border and multi-sectoral malaria initiatives implemented<br>Denominator<br>Regional/cross-border and multi-sectoral malaria initiatives planned | The indicator intends to monitor the status of multi sectoral and regional initiatives | National | 1 | 1 | 1 | NMCP Reports |
| 6.3 | Service Delivery Mechanism | Output Indicators | Indicator Description | Appropriateness of the Indicator | Malaria risk | Baseline 2020 | Mid Target 2023 | End Target 2025 | Source |
| 6.3.1 | Customize GLMI / EAC & DRC strategic framework for cross border collaboration on malaria control | Regional cross border malaria control action plan available | Numerator<br>NA<br>Denominator<br>NA | The indicator will measure state commitment | National | 1 | 1 | 1 | NMCP report |
| 6.3.2 | | | Numerator | | National | NA | 1 | 1 | |

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | Develop action plans with relevant Ministries outlining multi-sectoral malaria control intervention and targets | National multi sectoral malaria control action plan available | National multi sectoral malaria control action plan available<br>Denominator<br>NA | The multi-sectoral action plan will guide the respective sector in implementing coordinated initiatives for malaria control | | | | | NMCP Reports |

# APPENDIX 2: HMIS/DHIS 2 Indicators

| | Indicator | Description | Frequency |
|---|---|---|---|
| OPD | Confirmed Malaria | Malaria cases with a positive malaria test result with mRDT or Microscopy | Monthly |
| | Clinical Malaria | Probable malaria cases not tested but treated with antimalarials | Monthly |
| | Mild /Moderate Anaemia | Clinically or laboratory diagnosed | Monthly |
| | Severe Anaemia | Clinically or laboratory diagnosed | Monthly |
| | Total OPD attendances | All cases attending OPD | Monthly |
| | Suspect malaria cases | Estimated by adding up the number of malaria tests performed and the number of clinical malaria cases | Weekly |
| | Total malaria tests | Number of patients tested by mRDT or Microscopy | Weekly |
| IPD | Confirmed Malaria Admission | Malaria admission with a positive malaria test results either mRDT or Microscopy | Monthly |
| | Clinical Malaria Admission | Probable malaria admission not tested but treated with antimalarials and with a malaria discharge diagnosis | Monthly |
| | Severe Anaemia Admission | Patients with anaemia primary discharge diagnosis either clinical or laboratory confirmed | Monthly |
| | Total Admissions | Number of patients admitted | Monthly |
| | Confirmed Malaria Death | Deaths due to malaria, with positive malaria test results either mRDT or Microscopy | Monthly |
| | Clinical Malaria Death | Probable death due to malaria, not tested but treated with antimalarials and with a malaria discharge diagnosis | Monthly |
| | Severe Anaemia Death | Death due to anneamia, with death primary discharge diagnosis either clinical or laboratory confirmed | Monthly |
| | Total Deaths | Number of patients died during the admission | Monthly |
| RCH | IPTp 1 | ANC attendances receiving the first dose of IPTp | Monthly |
| | IPTp 2 | ANC attendances receiving the second dose of IPTp | Monthly |
| | IPTp 3+ | ANC attendances receiving the third and, eventually, further dose of IPTp | Monthly |
| | Antenatal first attendance | First ANC attendances before 12 weeks and after 12 weeks of gestational age | Monthly |
| | ANC first attendance malaria tests | First ANC attendances receiving a malaria test | Monthly |
| | ANC first attendance with malaria test positive | First ANC attendances with a positive malaria test | Monthly |
| | Antenatal LLIN delivery | Pregnant women who received a LLIN at ANC attendance | Monthly |
| | Infant LLIN delivery | Infant received a LLIN at EPI attendance | Monthly |

***Note: All indicators are disaggregated by age group (< 1 month, 1-11 months, 1-4 years, 5+ years) and gender (Male and Female)***

# APPENDIX 3: SME Implementation Plan for 2021-2025

| SO | SA | SDM# | SDM | 2021 | | | | 2022 | | | | 2023 | | | | 2024 | 2025 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | Q1 | Q2 | Q3 | Q4 | Q1 | Q2 | Q3 | Q4 | Q1 | Q2 | Q3 | Q4 | | |
| 3 | To provide timely and reliable information on malaria and its control needed to take appropriate actions in different transmission risk and ensure resources are used in the most cost-effective manner | | | | | | | | | | | | | | | | |
| | 3.1 | | Strengthen comprehensive malaria surveillance and response in health facilities for improved programmatic performance | | | | | | | | | | | | | | |
| | | 3.1.1 | Strengthen malaria surveillance and response across all epidemiological strata by improving the use of quality routine HMIS malaria data to generate reliable malaria indicators | x | x | x | x | X | x | x | x | x | x | x | x | x | x |
| | | 3.1.2 | Strengthen capacity for malaria epidemics detection, investigation and containment at Council and health facility level in epidemic prone areas | x | x | x | x | x | x | x | x | x | x | x | x | x | x |
| | | 3.1.3 | Implementation of Case Based Surveillance to support elimination interventions in very low malaria transmission risk areas | x | x | x | x | x | x | x | x | x | x | x | x | x | x |
| | 3.2 | | Strengthen malaria framework for collecting, processing and storing essential indictors from periodic service delivery initiatives and programmatic surveys in the communities | | | | | | | | | | | | | | |
| | | 3.2.1 | Coordinate and conduct representative population surveys according to SME plan | | x | x | | | | | | | x | x | | | x |
| | | 3.2.2 | Strengthen longitudinal vigilance of malaria parasitaemia in sentinel population: pregnant women at ANC | x | x | x | x | x | x | x | x | x | x | x | x | x | x |
| | | 3.2.3 | Conduct standard antimalarial Therapeutic Efficacy Study (TES) in sentinel sites as per WHO standard protocol | | x | | | | x | | | | x | | | x | x |
| | | 3.2.4 | Strengthen longitudinal monitoring of mosquito population dynamics in the sentinel sites | x | x | x | x | x | x | x | x | x | x | x | x | x | x |
| | | 3.2.5 | Strengthen longitudinal monitoring of efficacy and effectiveness of insecticides in national representative sentinel sites | | x | | | | x | | | | x | | | x | x |
| | | 3.2.6 | Coordinate the collection, analysis, interpretation and use of the programmatic monitoring of vector control initiatives (including LLINs, IRS and LSM) data | | x | | | | x | | | | x | | | x | x |
| | | 3.2.7 | Establish capacity for malaria related molecular surveillance for programmatic monitoring of parasites and vector dynamics | | | | | | x | x | x | x | | | | | |
| | 3.3 | | Strengthen a comprehensive malaria strategic information system to generate knowledge for evidence-based planning and decision making at all levels | | | | | | | | | | | | | | |
| | | 3.3.1 | Strengthen malaria data management capacity and the national repository arrangements to enable evidence-based decision making at all levels | x | | | | x | | | | x | | | | x | x |
| | | 3.3.2 | Conduct a comprehensive periodic stratification of malaria transmission risk in all councils for improved targeting of interventions | x | x | x | x | | | | | | | | | | |
| | | 3.3.3 | Undertake periodic malaria programme reviews and evaluation of the implementation of malaria strategic plan | | | | | | | | | | | x | x | | |
| | | 3.3.4 | Create conducive environment for continuous collaboration with research, academia institutions and research capacities at subnational levels to facilitate evidence based decision making at all levels. | x | x | x | x | x | x | x | x | x | x | x | x | x | x |

# APPENDIX 4: SME Budget, 2021 – 2025

| SA | SDM | Needs | | Anticipated | | Gap | |
|---|---|---|---|---|---|---|---|
| | | 2021-2023 | 2021-2025 | 2021-2023 | 2021-2025 | 2021-2023 | 2021-2025 |
| Surveillance | HMIS | 12,500,000 | 19,500,000 | 4,466,165 | 6,966,165 | 8,033,835 | 12,533,835 |
| | MEEDS | 2,180,000 | 2,880,000 | 652,880 | 1,152,880 | 1,527,120 | 1,727,120 |
| | CBS | 2,760,000 | 5,150,000 | 1,576,454 | 1,576,454 | 1,183,546 | 3,573,546 |
| | **SUB TOTAL** | **17,440,000** | **27,530,000** | **6,695,498** | **9,695,498** | **10,744,502** | **17,834,502** |
| Periodic surveys | MIS & SMPS | 4,490,000 | 6,410,000 | 1,386,740 | 1,386,740 | 3,103,260 | 5,023,260 |
| | ANC | 30,000 | 50,000 | - | - | 30,000 | 50,000 |
| | TES | 1,350,000 | 2,250,000 | 1,259,772 | 1,859,772 | 90,228 | 390,228 |
| | MVS | 1,283,698 | 1,823,698 | 673,500 | 673,500 | 610,199 | 1,150,199 |
| | IST | 780,000 | 1,300,000 | 750,000 | 1,250,000 | 30,000 | 50,000 |
| | Programmatic MVS | 1,050,000 | 1,705,000 | 750,000 | 1,250,000 | 300,000 | 455,000 |
| | Molecular Surveillance | 4,530,000 | 7,550,000 | 4,500,000 | 6,000,000 | 30,000 | 1,550,000 |
| | **SUB TOTAL** | **13,513,698** | **21,088,698** | **9,320,011** | **12,420,011** | **4,193,687** | **8,668,687** |
| Strategic Information | Micro strata | 1,549,000 | 1,862,400 | 523,082 | 523,082 | 1,025,918 | 1,339,318 |
| | Strategic Repository | 2,350,000 | 3,600,000 | 2,060,704 | 3,260,704 | 289,296 | 339,296 |
| | MPR/MTR | 350,000 | 700,000 | - | - | 350,000 | 700,000 |
| | Operational Research | 1,650,000 | 2,750,000 | 450,000 | 750,000 | 1,200,000 | 2,000,000 |
| | **SUB TOTAL** | **5,899,000** | **8,912,400** | **3,033,787** | **4,533,787** | **2,865,213** | **4,378,613** |
| | **SME TOTAL** | **36,852,698** | **57,531,098** | **19,049,296** | **26,649,296** | **17,803,402** | **30,881,802** |