Somali National Malaria Strategic Plan 2021 – 2025

Towards an Accelerated and Coordinated path to National Elimination

Draft 0 (March 31, 2020)

Developed Jointly by the National Malaria Control Programs (NMCPs) of Federal Government, and the Federal Member States

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List of Acronyms

ABER	Annual Blood Examination Rate
ACT	Artemisinin Combination Therapy
API	Active Parasitic Index
BCC	Behavioural Change Communication
CHC	Community Health Committees
CHW	Community Health Workers
DHB	District Health Board
DHIS	District Health Information System
DHMT	District Health Management Team
EMP	Essential Medicines Program
EPHS	Essential Package of Health Services
EPI	Expanded Programme on Immunisation
EPR	Emergency Preparedness and Response
EUV	End User Verification
FAO	Food and Agriculture Organisation
FSNAU	Food Security & Nutrition Analysis Unit
GDP	Gross Domestic Product
GFATM	Global Fund to Fight AIDS, Tuberculosis, and Malaria
HAB	Health Advisory Board
HF	Health Facility
HH	Household
HMIS	Health Management Information System
HP	Health Post
HSC	Health Sector Committee
HSS	Health Systems Strengthening
HSSP	Health Sector Strategic Plan
IDP	Internally Displaced Person
IEC	Information, Education, and Communication
IOM	International Organisation for Migration
IPT	Intermittent Presumptive Treatment
IRM	Insecticide Resistance Management
IRS	Indoor Residual Spraying
ITN	Insecticide Treated Net
LLIN	Long Lasting Insecticidal Net
LMIS	Logistics Management Information System
LSM	Larval Source Management
M&E	Monitoring and Evaluation
MCH	Maternal and Child Health
MICS	Multiple Indicator Cluster Survey
MIP	Malaria in Pregnancy
MIS	Malaria Indicator Survey
MoH	Ministry of Health
MoHD	Ministry of Health and Development
MPR	Malaria Program Review
MWG	Malaria Working Group
NMCESP	National Malaria Control and Elimination Strategic Plan
NMCP	National Malaria Control Program
NMSP	National Malaria Strategic Plan
NMTG	National Malaria Treatment Guidelines
OPD	Outpatient Department
PESS	Population Estimation Survey
PHC	Primary Health Care
PHCs	Public Health Coordinators
PHS	Public Health Supervisors
PHU	Primary Health Units
PSCM	Procurement and Supply Chain Management
PSM	Procurement and Supply Management
QA	Quality Assurance
QC	Quality Control
RDT	Rapid Diagnostic Test
SCMWG	Supply Chain Management Working Group
SWALIM	Somalia Water and Land Information Management
UN	United Nations
UNFPA	United Nations Population Fund
UNHCR	United Nations High Commission for Refugees
UNICEF	United Nations Children's Fund
VHC	Village Health Committee
WASH	Water, Sanitation and Hygiene
WHO	World Health Organisation

Acknowledgments

Executive Summary

1 INTRODUCTION

Somalia (*Soomaaliya* in Somali) and officially the Federal Republic of Somalia (*Jamhuuriyadda Federaalka Soomaaliya*) is located in the Horn of Africa, bordered by Ethiopia to the west, the Gulf of Aden to the north, the Guardafui Channel and Somali Sea to the east, and Kenya to the southwest. Malaria poses a major health risk in Somalia with a disproportionate distribution of the disease burden with a significant proportion of Puntland and Somaliland considered to be areas of very low transmission[1]. Malaria epidemics can occur when climate and other conditions suddenly favour transmission in areas where people have little or no immunity to malaria. The malaria response in Somalia has been premised on multiple strategic plans and policies aligned to overall national health strategic directions. This Somalia National Malaria Control and Elimination Strategic Plan (NMCESP) for period of 2021 – 2025 is premised on lessons learnt from previous strategic plans, the need for an ambitious approach to attain pre-elimination and better strategic focussing of national response.

1.1 Purpose of the NMCESP

The purpose of the NMCESP for the Somali malaria control and elimination 2021 – 2023 are:

(i) Articulate a strategic framework for the implementation of the country's malaria response including proving the priorities and expected results.
(ii) Provide guidance for the acceleration towards sub-national elimination agenda.
(iii) Enhance the coordination and the Monitoring and Evaluation (M&E) arrangements.
(iv) Provide a resource mobilisation tool for the national malaria control and elimination agenda.

1.2 Strategic Plan Development Process

This NMCESP was developed through a highly inclusive and consultative process. The foundation for the strategic plan was built upon the outcomes of the 2019 Somalia Malaria Program Review (MPR) as well as other country assessments particularly the malaria matchbox analysis and vulnerability assessments. The MPR provided the foundation for comprehensive analysis of the national malaria response as well as the strategic direction to be adopted for long-term high impact and sustainable national response. Two level consultative meetings were held to agree on strategies and then ratify the final strategic document over a period of one month apart. In between, multiple reviews and iterations with the stakeholders were made during the drafting process. The national malaria control programs (NMCPs) took lead in the strategic plan development process with technical support from the World Health Organisation (WHO). UNICEF provided the funding and additional technical support for the process. The draft versions of the document were reviewed by the different stakeholders and comments incorporated following consensus.

[1] McClanahan TR, Sheppard CRC, Obura DO (2000). *Coral Reefs of the Indian Ocean: Their Ecology and Conservation*. Oxford University Press, 2000. ISBN 0-195-35217-3

2 BACKGROUND

2.1 Country Profile

2.1.1 Political governance and Administrative structure

Somalia operates as a semi-federal state system with three principal political regions (or Zones): Central South (CSZ), Somaliland and Puntland[2]. The administration, including the health sector, collapsed following the start of the civil war in 1991. During the decade form 2000, partners have helped the various State led health delivery. Across the three autonomous states there are 18 regions (*gobollada*) (Above figure left). According to the UN's second-level administration mapping system there are 74 districts (*degmooyin*) across the 18 regions[3] [Figure 1].

Figure 1: Map of Somalia

The country borders Ethiopia to the west, the Gulf of Aden to the north, the Guardafui Channel and Somali Sea to the east, and Kenya to the southwest. Across the Gulf of Aden is Yemen. Its coastline is more than 3,333 kilometres in length, the longest of any country in mainland Africa and the Middle East region. The states of Puntland and Somaliland have autonomous governance structures with independent health ministries. Somalia's politics, security and development collectively create a complex environment, with much of the country's recent past marked by recurrent climatic shocks, armed conflict and violence. The southern part of the country is prone to conflicts and insurgency that continues to affect access and quality of services.

Unlike many African populations, majority of the Somalis are part of a single, homogeneous ethnic group with a common language and culture. Described as the most culturally homogenous country in Africa, the country has Somali and Arabic as the two major spoken

[2] UN Office for the Coordination of Humanitarian Affairs (OCHA), 2017: https://reliefweb.int/map/somalia/somalia-administrative-map-31072017; accessed March 3, 2020

[3] Food and Agricultural Organisation, Geonetwork: http://www.fao.org/geonetwork/srv/en/main.home. : accessed March 10, 2020

languages. Despite being ranked second on the Fragile States Index each year since 2014[4], the country has continued path of recovery from decades of civil strife building on the establishment of the federal government in 2012. That same year, a provisional Somali constitution[5] was established based on the principles of power sharing in a federal state. The provisional constitution promotes human rights, the rule of law, justice, participatory consultation and separation of legislative, executive and judiciary powers. It also emphasizes the role of women's participation in national institutions including elected and appointed positions[6]. Generally, South Central Somalia is considered a highly challenging environment with some areas considered challenging for effective services delivery.

The provisional constitution lays the foundation for the establishment of a Human Rights Commission which will be tasked with education on human rights and addressing situations where human rights breaches have occurred. Somalia is a parliamentary representative democratic republic with the President as head of state and the executive. The other arms of government are the legislature (Federal Parliament of Somalia) and judiciary. The parliament elects the President, Speaker of Parliament and Deputy Speakers; and has the authority to pass and veto laws. The country operates decentralised governance with devolution of some level of autonomy to the lower levels. Somali law draws from a mixture of three different systems, civil law, Islamic law and customary law[7]. The constitution of Somalia likewise defines Islam as the state religion of the Federal Republic of Somalia, and Islamic sharia law as the basic source for national legislation.

2.1.2 Demography, Religion and culture

The total population in 2014 is estimated to be 12.3 million people[8] and is projected to be 14 million in 2020. The 2014 Population Estimation Survey (PESS) indicated that the average household size in Somalia consisted of 6.5, 6.4, 5.8 and 3.7 persons in Nomadic, Urban, Rural and IDPs populations respectively. Out of the total population, 42% were living in urban areas and 23% were living in rural areas. The nomadic population constituted 26% and the internally displaced persons made up 9% of the population. The country has a youthful population with just under half (45.6%) being less than 15 years and 75% under 30 years[9]. The population distribution is highly varied across the country with most country having a population density of under five persons per 100m grid (Figure 2).

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[4] "Fragile States Index 2018". The Fund for Peace. 10 April 2019. Retrieved June 9, 2019. Accessed on November 29, 2019 from https://fundforpeace.org/2019/04/10/fragile-states-index-2019/

[5] The United Nations Political Office for Somalia (UNPOS). The Provisional Constitution of the Federal Republic of Somalia. Available from https://unpos.unmissions.org/sites/default/files/Adopted_Constitition_ENG_Final percent20for percent20Printing_19SEPT12_0.pdf

[6] The United Nations Political Office for Somalia (UNPOS). The Provisional Constitution of the Federal Republic of Somalia. Available from https://unpos.unmissions.org/sites/default/files/Adopted_Constitition_ENG_Final percent20for percent20Printing_19SEPT12_0.pdf

[7] "CIA, The World Factbook – Somalia". Available from https://www.cia.gov/library/Publications/the-world-factbook/geos/print_so.html

[8] United Nations Populations Fund (UNFPA), 2014; Population Estimation Survey (PESS) 2014. https://somalia.unfpa.org/sites/default/files/pub-pdf/Population-Estimation-Survey-of-Somalia-PESS-2013-2014.pdf; accessed on March 1, 2020

[9] ibid

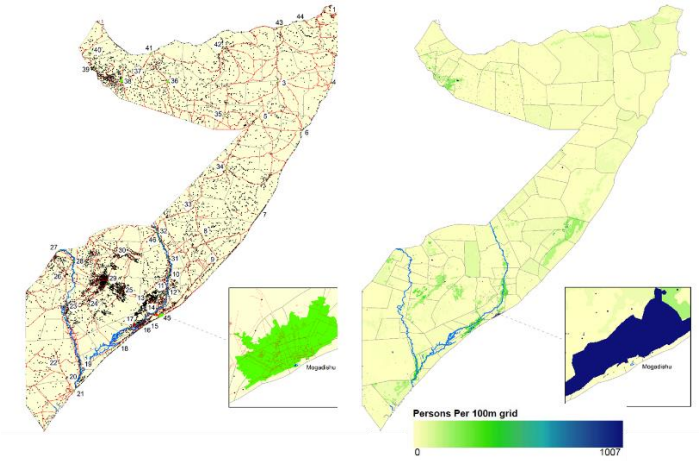


Figure 2: Population density and settlement in Somalia

There are an estimated 2.1 million in crisis and emergency with 2.6 million IDPs in Somalia[10]. According to UNHCR data, of the 2.3 million displacements, 1.26 million displacements are drought related, around 0.7 million are conflict related and 0.3 million are floods related[11]. Somalia's politics, security and development collectively create a complex environment, with much of the country's recent past marked by recurrent climatic shocks, armed conflict and violence. With most Somalis dependent on agriculture, forestry and fisheries, climate change is a major concern, as disruptions to the weather lead to phenomena such as drought and flood, two common factors that drive humanitarian need in the country. The location of internally displaced persons and refugees is distributed countrywide as of December 2019 (figure 3). In addition to the IDPs, there exist other temporary migrants coming in from Ethiopia and Djibouti as well as traders and truckers transiting through the country as part of wider economic activities.

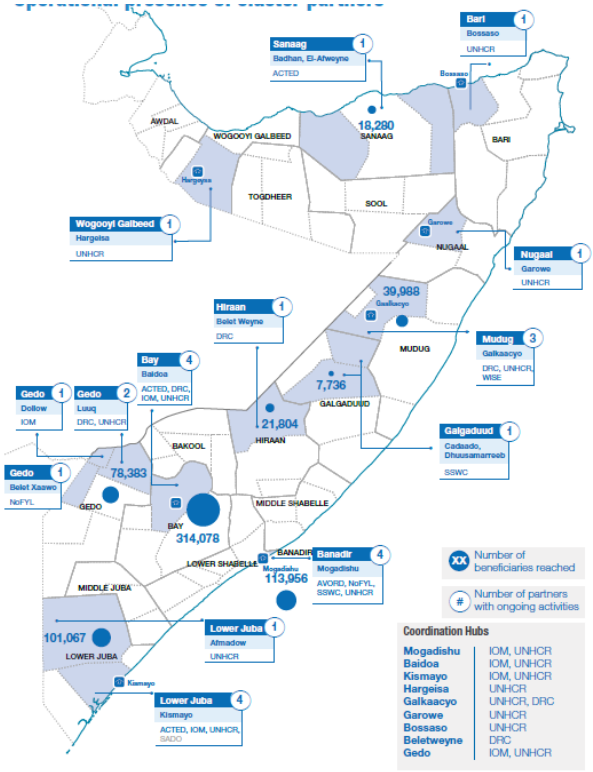


Figure 3: distribution of mapped IDPs in Somalia

As with other areas of the Horn of Africa and neighbouring regions, the worst desert locust outbreak in over 25 years threatens agriculture and pasture in Somalia, according to the Food and Agriculture Organization (FAO). Somaliland, Puntland and Galmudug are predicted to be the worst affected with already an estimated 70,000 hectares of land infested by hoppers and breeding adult locusts. According to the 2019 *post-Gu* assessment - conducted by FAO's Food Security and Nutrition Analysis Unit (FSNAU) - cereal production had declined by up to 70 per cent in southern Somalia during the 2019 cropping season. This further creates vulnerability and increased risk of diseases in the population.

[10] OCHA, January 2020; Somalia: Humanitarian Dashboard - December 2019 (published 14 January 2020); https://reliefweb.int/report/somalia/somalia-humanitarian-dashboard-december-2019-14-january-2020, accessed March 1, 2020

[11] ibid

Somalia has been described as the most culturally homogenous country in Africa with over 85% of its residents are ethnic Somalis while ethnic minorities largely concentrated in the southern regions. The official languages of Somalia are Somali and Arabic. Most people in the country are Muslims, the majority of whom belong to the Sunni sect of Islam. Somalia is a country with strong cultural arrangement built around the clans and ethnic groupings (figure 4).

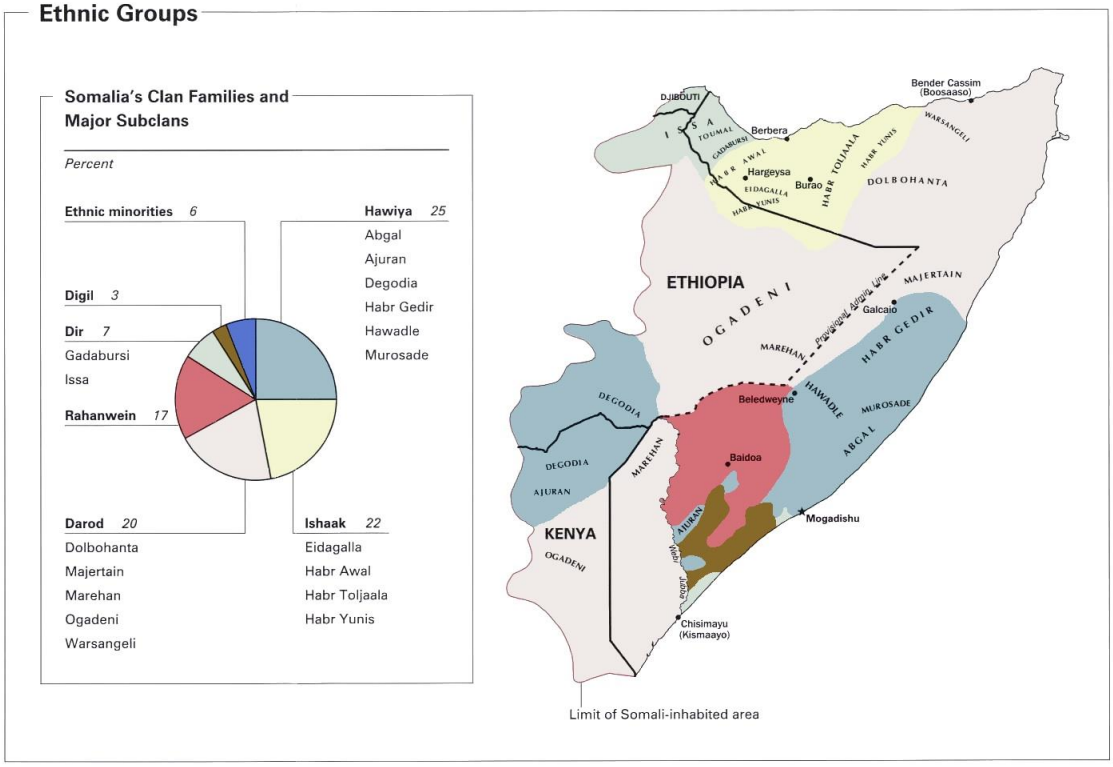


Figure 4: Somali clans distribution[12]

2.1.3 Geography, Hydrology and Climate

Somalia has the longest coastline on Africa's mainland, and its terrain consists mainly of plateaus, plains, and highlands. In the North of Somalia, a low-lying coastline borders the Gulf of Aden, beyond which, running parallel to the Coast, a series of dry hills, the Haud, at 500 to 2,000 meters above sea level, form a skeletal framework for the country, they descend thereafter to the south-east as they join the Ethiopian Ogaden. In the East and the South, the plateau ends in arid steppes, from under 200 meters above sea level down to the Indian Ocean. The plains drain into the Juba River in the south and Shabelle River in the centre, which disappears into a swamp before reaching the coast. The Shimbris Mountains lie at 2,414 mASL in Sanaag region and it's the highest peak in Somalia. Karkaar Mountains extend east to west in the far north Bari region rising as high as 2,071 mASL and Gacab Libaax lie at 2,008 mASL in Togdheer[13].

[12] Map derived from: https://upload.wikimedia.org/wikipedia/commons/8/8b/Somalia_ethnic_grps_2002.jpg

[13]

Overall, Somalia is classified as having an arid to semi-arid climate. North and South movement of the inter-Tropical Convergence Zone (iTCZ) determines rainfall, the primary characteristic of climate in Somalia. The annual cycle of movement from the iTCZ provides great spatial variation in precipitation levels[14]. Additionally, the iTCZ contributes to temporal variation in rainfall, which in most parts of the country results in two wet-seasons. The *Gu* occurs in the period between March and July and the *Deyr* from August to November. The months of highest rainfall within these seasons are generally from April-June and October-November respectively. Outside of the wet-seasons are two distinct dry periods which vary across the country in their onset, based on when the wet-seasons end. The principal dry season is the *Jilaal*, occurring between December-March, when the iTCZ is far to the south. The secondary dry season, the Haggai, occurs between the Gu and Deyr wet seasons. On average Somalia receives 500 mm of rainfall each year. See figures 5 to 7 below for variations.

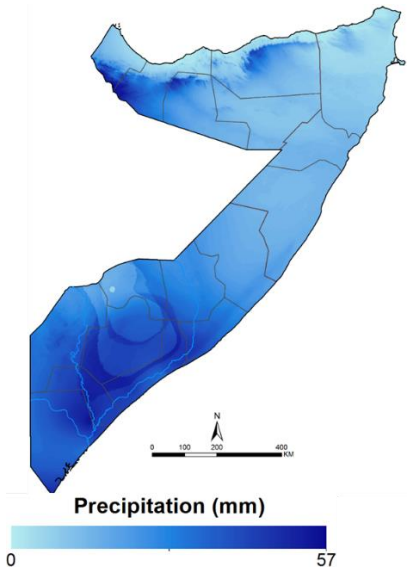


Figure 5: Somalia annual average Precipitation

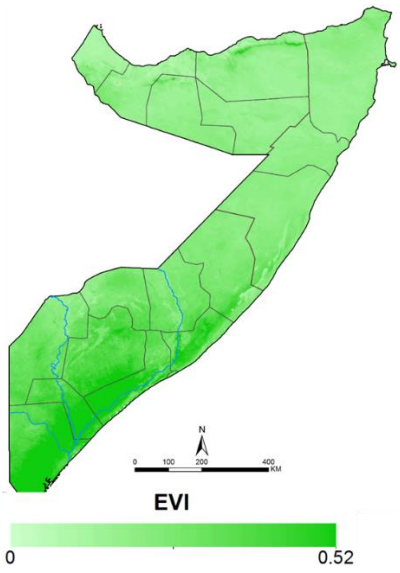


Figure 6: Somalia Enhanced Vegetation Index (EVI)

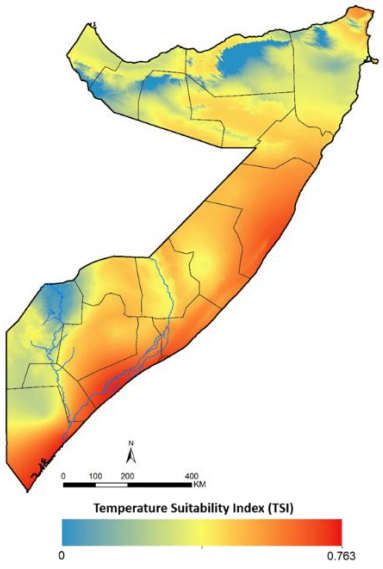


Figure 7: Temperature Suitability Index for Somalia

Across years, of all climatic parameters, rainfall offers the most variability and unpredictability. This can lead to droughts which can persist for years in more arid locations such as the northern coastline and inland areas of the north-eastern coast. Conversely, there can be intense downpours that lead to flash flooding which are a common occurrence along the intermittent *wadis* in the North of the country. Floods are also prevalent along the Juba and Shabelle alluvial plains. Historically, floods have affected riverine areas during the *Deyr* season (Principally between October to December), and less frequently during the *Gu* season. Rainfall is a key determinant of growing seasons and the types of agriculture practiced, directly influencing surface runoff, stream flow, and groundwater recharge. Years in which rainfall patterns are anomalous can result in food insecurity as well as increased seasonal malaria transmission and epidemic outbreaks.

[14] McClanahan TR, Sheppard CRC, Obura DO (2000). *Coral Reefs of the Indian Ocean: Their Ecology and Conservation*. Oxford University Press, 2000. ISBN 0-195-35217-3

2.2 Policy Environment and broader development framework

2.2.1 Strategic framework for development

Somalia Federal Government crafted the first National Development Plan (NDP) 2017 – 2019 that stipulates the short to medium term strategic direction, development priorities and proposed implementation mechanisms including the use of development aid[15]. The theme of the NDP is to accelerate socio-economic transformation in order to achieve the stated objectives for poverty alleviation, economic revival and societal transformation in a socially just and gender equitable manner. The NDP articulates the need for the health sector will address the burden of communicable and non-communicable diseases such as malaria, HIV, TB, hepatitis, and other diseases through coordinated and targeted behaviour change communication, improved case detection and treatment[16].

2.2.2 Key development indicators

The key development indicators for the country reflect wide variances in achievement, with missing information leaving an incomplete picture of the actual situation (Table 1). Somalia has maintained an informal economy, mainly based on livestock, remittances from Somalis working abroad, and telecommunications. It is a member of the United Nations, the Arab League, African Union, Non-Aligned Movement, and the Organisation of Islamic Cooperation.

Table 1: Key Development Indicators[17]

Development Indicators	Latest data	References/notes
Human Development Index	Not ranked	United Nations Development Program (UNDP)
Gross domestic product (GDP)	USD 4,721,000,393	The World Bank, 2018
Estimated per capita GDP	US$ 314.56, 2018	The World Bank estimate
Life expectancy at birth (years)	56.7	UNDP
Employment in services (percent of total employment)	21.17 percent, 2019 ILO estimate	UNDP
Employment in services, male	21.48 percent, 2019	World Bank; percent of male employment, ILO estimate
Employment in services, female	19.99 percent, 2019	World Bank; percent of female employment, ILO estimate
population using the Internet	2.0 percent, 2017	World Bank

[15] Somalia National Development Plan (2017-2019) [SNDP] –Towards Recovery, Democracy and Prosperity; Ministry of Planning and International Cooperation.
[16] Somalia NDP 2017 – 2019 page 107.
[17] References used: UNDP Human Development Reports (HDR) available from http://hdr.undp.org/en/countries/profiles/SOM; World Bank data available from https://data.worldbank.org/country/somalia

Table 1: Key Development Indicators[17]

Development Indicators	Latest data	References/notes
Mobile phone subscriptions (per 100 people)	46.5, 2019	UNDP
Urban population growth rate	4.13 percent, 2018	World Bank
Rural population growth rate	1.78 percent, 2018	World Bank
Age dependency ratio (percent of working-age population)	97.82 percent, 2018	World Bank
Unemployment, total (percent of total labour force)	13.96 percent, 2019	World Bank based on modelled ILO estimate
Foreign direct investment, net inflows (percent of GDP)	8.66 percent, 2018	World Bank
Health expenditure (percent of GDP)	67 percent, 2018	World Bank
Net primary school enrolment ratio per 100 school-age children	Total: 17, Male 18, Female 17; 2014	WHO EMRO

The country remains considered among the least developed countries (LDCs) and has low performances across most development indicators[18]. Comparatively, the country has progressed from being among the bottom 10 LDCs over the last decade following the recovery from civil strife. There is high level of social dependency and inequality in the population. The country has the lowest GDP and GDP per capita in the horn of Africa and is considered among the lowest ranked countries in Africa. Over 50 percent of the population lives in poverty, with people in IDP camps experiencing the highest rates of poverty (up to 70 percent). In addition to armed conflict, poverty in Somalia is exacerbated by ongoing natural disasters including periods of drought and recently the locust infestation in the horn of Africa[19].

2.3 Health System Structure

2.3.1 General health sector profile

Health care in Somalia is delivered through mix of public and private serves providers. The public-private mix including their utilisation continues to vary significantly from South Central through Puntland to Somaliland as well as at district level. The burden of disease is heavily dominated by communicable diseases, reproductive health problems and undernutrition issues; with non-communicable diseases and mental disorders[20] are also on the rise. The country is implementing the Second Health Sector Strategic Plan 2017 – 2019 (HSSP-II) that outlines the vision, goals and

[18] The World Bank, 2019; World Bank Country and Lending Groups https://datahelpdesk.worldbank.org/knowledgebase/articles/906519, accessed on March 8, 2020
[19] Food and Agricultural Organisation (FAO) Regional Office for Africa; The Desert Locust ravages the Horn of Africa; http://www.fao.org/africa/news/detail-news/en/c/1255390/, accessed March 8, 2020
[20] WHO, 2018; 2017 Mental Health Atlas, Geneva, Switzerland

objectives for the health sector. The health sector continues to focus on improving the health outcomes with special emphasis on five key priorities of (i) health security and prevention and control of communicable diseases; (ii) noncommunicable diseases, mental health, violence and injuries, and nutrition; (iii) promoting health through the life-course; (iv) health systems strengthening; and (v) preparedness, surveillance and response[21].

The national health strategy is built around the Essential Package of Health Services (EPHS) was designed in 2009 and is widely endorsed. It comprises of: Four levels of service provision, Ten health programmes, and Six management components[22]. The four levels of services provision within are: (i) The primary health unit (PHU), (ii) the health centre (HC), (iii) the referral health centre (RHC), and (iv) the hospital (H). There are six core programmes that are found at all four levels and four additional programmes that are found only at the referral levels, with HIV, STIs and TB is considered a core program of EPHS. The delivery of health services for HIV/AIDS shall be premised around this structure of the health system[23]. The EPHS framework defines the standard of health services that should be provided at each level of the health care. The intervention includes the training and deployment of human resources and the provision of essential medicines, supplies and equipment. The distribution the different levels of the health facilities vary according region (figure 8) and numbers continue to change based on level of partner support.

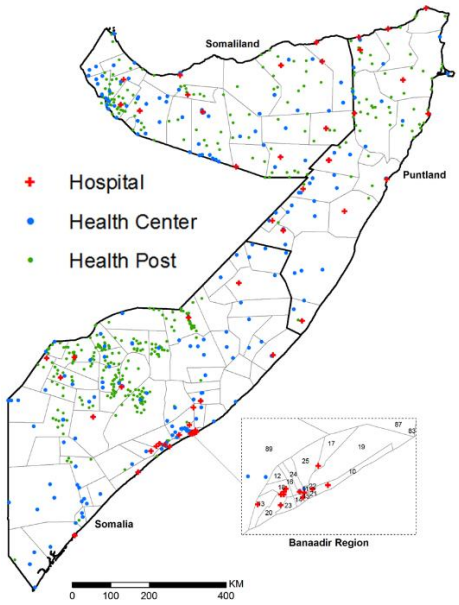


Figure 8: Distribution of health facilities 2018 (WHO modelled data)

The health management information system (HMIS) is partially functional in all the three zones, supported mainly through the Global Fund to Fight AIDS, Tuberculosis and Malaria (GFATM), Global Alliance in Vaccine and Immunization and the Somali Joint Health and Nutrition Programme (JHNP). Overall reporting level varies across districts and is routinely hampered by security and geographical access especially in South Central despite efforts to roll-out the District Health Information System version two (DHIS2) as the mainstay of the HMIS. 65% of the health facilities consists of PHUs formed from health posts and staffed by at least one trained Community Health Worker (CHW) providing basic health prevention and promotion services.

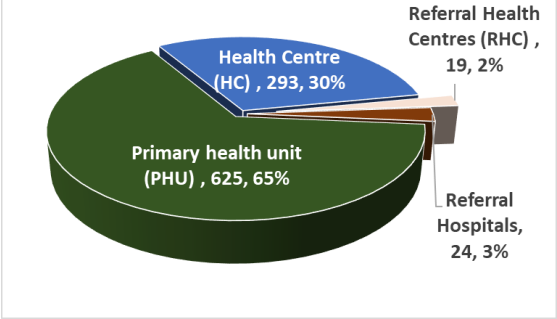


Figure 9: Distribution of health facilities (2018)

[21] WHO EMRO, 2016; Somalia health profile 2015; page 5
[22] Nigel Pearson and Jeff Muschell, 2009. The Essential Package of Health Services; UNICEF Somalia
[23] EPHS, pages 14 - 15

2.3.2 Somalia health indicators

The key health indicators defining the situation of health care in Somalia is provided in table 2. It is notable that accurate and reliable country data remains a challenge and most data are modelled estimates from the country. Access to healthcare continues to worsen due to widespread, persistent violence, and the health system remains fragmented, under-resourced and ill-equipped to provide lifesaving and preventative services. Somalia has less than one health facility per 10,000 persons (a rate of 0.76), leaving the country 38 per cent towards achieving a facility density target of two/10,000. Somalia has one health facility, regardless of level, per 13,200 people, with maternity services lacking in 60 per cent of all population settlements.

Table 2: Key Health Indicators[24]

Development Indicators	Result	Year
Life expectancy at birth (years), 2016		
Total fertility per woman	6.4	2015
Adolescent fertility (15–19 years), Per 1000 girl		2016
Low birth weight among new-borns	-	
Children under 5 who are stunted	42.1%	2015
Anaemia among women of reproductive age (15–49 years)	-	
Access to improved drinking water	31%	2015
Neonatal mortality per 1000 live births	39	2017
Infant mortality per 1000 live births	80	2017
Under five mortality per 1000 live births	127	2017
Maternal mortality ration per 100,000 live births	732	2017
Physicians per 10,000 population		
Nursing/idwifery per 10,000 population		
Antenatal care coverage (1+ visits)	24.2%	
Antenatal care coverage (3+ visits)	3.3%	
Measles immunisation coverage	60%	2017

Displaced and marginalized groups face barriers to healthcare and higher exposure to disease. With over 1.5 million people extremely food insecure, worsening rates of malnutrition are alarming; this continues to consequentially lead to higher rates of morbidity from diarrheal diseases, measles, and malaria. In response, Health Cluster partners primarily provide direct health services, working in conjunction with federal- and state-level health authorities to fill gaps in human resources, supplies and equipment. Given the link between healthcare, malnutrition and sanitation, integrated multi-cluster teams are used as a response modality, critical for malaria as well.

2.4 Current Malaria Profile and the Pathway to Elimination

2.4.1 Parasite & Vector species composition

The diversity of the topographic and climatic conditions from the south to the north of Somalia has a marked effect on the distribution, abundance and infectivity of malaria by dominant

[24]. Unless cited: WHO Eastern Mediterranean Region, 2018; Framework for health information systems and core indicators for monitoring health situation and health system performance. http://applications.emro.who.int/docs/EMROPUB_2018_EN_20620.pdf?ua=1, accessed on March 4, 2020

vectors[25].Entomological evidence shows that *Anopheles arabiensis* is the main and often, the only vector in the country. The presence of *An. funestus* and *An. nili* have also been reported in the South. In the North East *An. pharoensis* and *An. d'thali* have been described[26].

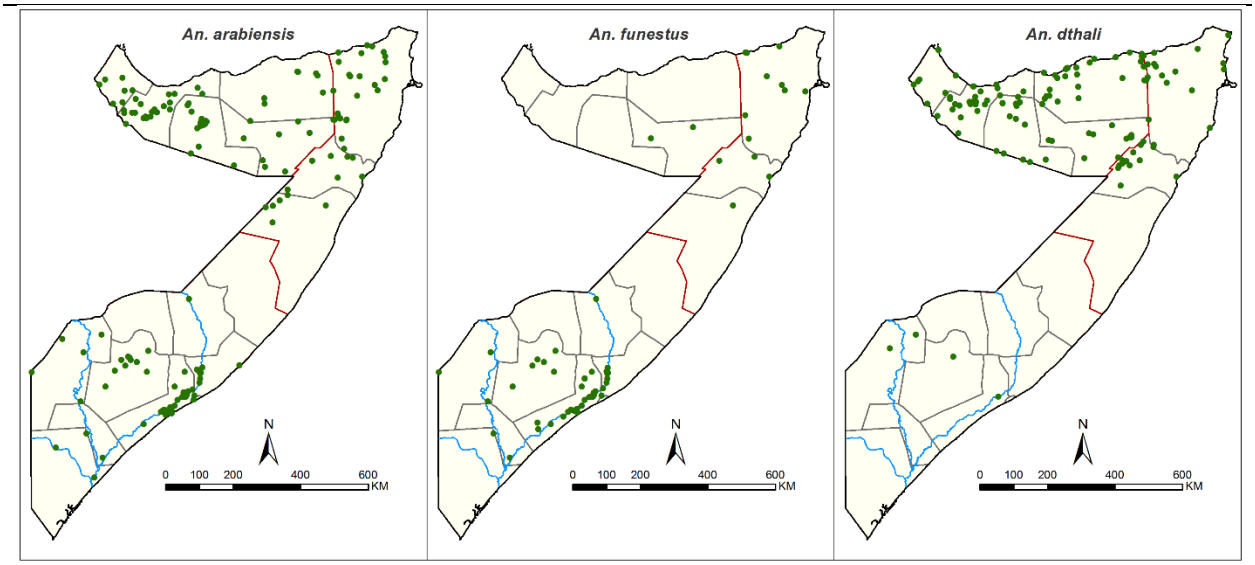


Figure 10: Distribution of vector species in Somalia

An. arabiensis breeds in temporary pools of water that are typically small, shallow, open and sunlit. The diversity of habitats could include burrow pits, drains, brick-pits, ruts, car tracks, foot and hoof prints, water holes, river overflows, pools left by receding rivers, backwaters, rice fields etc. This species also breeds in *birkits* (cement lined water reservoirs) in Somaliland and Puntland. *An. arabiensis* is markedly exophilic, exophagic and being both zoophilic and anthrophilic. Comparatively, *An. funestus* is highly anthrophilic, endophilic and endophagic.

The dominant species of malaria throughout Somalia is *P. falciparum* and responsible for >90% of infections. Combination therapy with Artesunate and Sulphadoxine-Pyrimethamine (SP) was adopted in 2005 for the 1st line treatment of *P. falciparum*, after the rapid spread of chloroquine resistance and based on the proven clinical efficacy of this combination. Based on historical Therapeutic Efficacy Studies and other field evidences, the guidelines were revised in 2016 to consider the need for effective Artemisinin Combination Therapy (ACT). As such, Artemether/lumefantrine was recommended as first-line drug for uncomplicated malaria (all species) based on the evidence of its high cure rate (>97%) and the low cure rate (<80%) with artesunate plus sulfadoxine–pyrimethamine with Dihydroartemisinin/piperaquine was chosen as the second-line treatment for uncomplicated falciparum malaria[27]. This same guideline also provides for effective malaria prevention in pregnancy, treatment of sever malaria and reinforces the need for mandatory parasitological test for all

[25] Noor A, Kinyoki D, Alegana V., Yusuf, F. E., Amran J., Borle M., (2013). Malaria control and the Plasmodium falciparum morbidity and mortality burden in Somalia: 2007-2010., (unpublished paper) page 6
[26] WHO. (2017). Field Assessment and Implementation of Operational Research for Larval Source Management in Somalia, p10
[27] NMCP, 2016: Guidelines for the Diagnosis and Treatment of Malaria in Somalia 2016

presumptive malaria cases at all levels. *P. vivax* transmission is found in the country, with low level parasite rates featuring mainly in Somaliland, Puntland and Northern coastal areas of South and Central Somalia.

2.4.2 Transmission Seasons and prevalence

The two malaria transmission seasons in Somalia coincide with the spring (May-August) and the autumn (December – January) rains[28]. The intensity of malaria transmission varies in different parts of the country, ranging from unstable and epidemic- prone areas in Puntland and Somaliland, to moderate in central regions, and moderate to high in the southern regions[29]. Small area estimation (SAE) methods were employed in 2014 to provide risk estimates for 2005, 2010 and 2014 and selections made for each of the 109 districts where the highest intrinsic *P. falciparum* prevalence by district. It was decided to provide a maximal receptive risk estimate given the large inter-annual variation in risks based on rainfall and the fact that should intervention coverage cease it would be better to define a level of risk in the theoretical absence of intervention. Data from the national malaria indicator survey data for 2014 were simply summarised and shown as a regional map (right hand map in figure 11).

The Malaria Indicators Survey (conducted in 2017) shows that fever prevalence was less than 2% in 13 of the 17 regions.[30] The *plasmodium* prevalence has been at 1.9% in whole of Somalia which is the same as was in 2014 MIS. Though there has been a significant increase in the prevalence in Puntland, considerable decrease was observed in South Central and relatively no change was found in Somaliland.[31] A study of 158 mosquito breeding sites in Bossaso district, documents that overall the *birkits* form the most productive habitats in Bossaso region (89%) and that 99.4% of the habitats were man-made. All breeding habitats are near human dwellings. Hence, predisposing the household occupants to mosquitoes and malaria transmission[32].

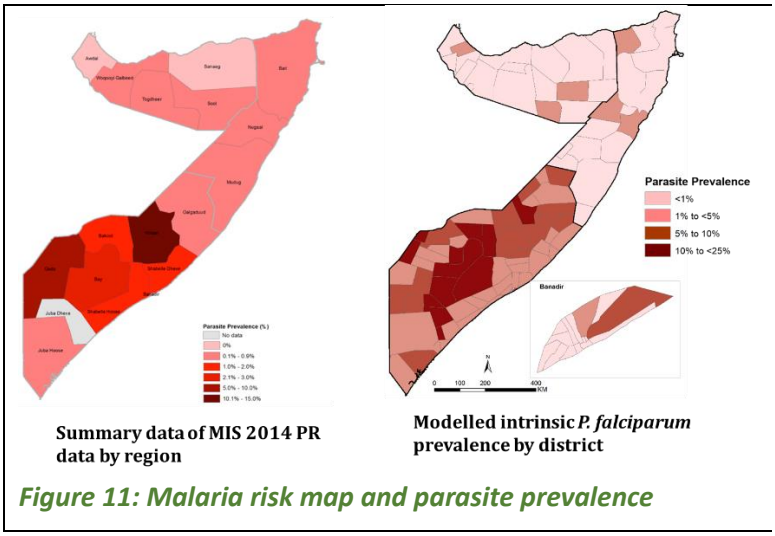


Figure 11: Malaria risk map and parasite prevalence

[28] Malaria control and the Plasmodium falciparum morbidity and mortality burden in Somalia: 2007-2010; Noor et al 2013, p6
[29] Field Assessment and Implementation of Operational Research for Larval Source Management in Somalia, WHO 2017, p8
[30] National Malaria Control Programme. (2018). Somali Malaria Indicator Survey 2017 Report (Unpublished)
[31] ibid
[32] Field Assessment and Implementation of Operational Research for Larval Source Management in Somalia, WHO 2017, p16

2.4.3 Vulnerable Population Sub-groups

The epidemiology of malaria transmission in Somalia exposes the whole population to varying levels of risks of the disease. Malaria transmission is endemic in the riverine areas while there are low levels of transmission in the remaining parts of the country. This poses different threats to different population groups: (i) in endemic areas, children under 5, pregnant women and IDPs, especially those from areas of unstable transmission (more malaria prone); and (ii) in areas of low levels of transmission, where all age groups are vulnerable due to low or no immunity which increases susceptibility to malaria outbreaks. The northern districts of Somaliland and Puntland some of eastern parts of Central and South are at highest epidemic risks due to low transmission and limited immunity to malaria. These are also the districts with high frequency of rainfall anomalies and where malaria transmission is unstable and hypo-endemic. Overall, around one half of the population (48%) is exposed to conditions with high or very high risk of epidemics (8% live in Puntland, 7% in Somaliland and 32% in Central South Somalia)[33]. The vulnerabilities across the population has been documented in the 2019 malaria matchbox assessment that preceded the Malaria Program Review (MPR). The key population level vulnerability and epidemic risks by region and ecozone is provided in table 3 below.

Table 3: Malaria risk by ecozones of Somalia[34]

Ecozone	Region(s)	Estimated 2018 population	Epidemic risk stratification
Desert climate	Bari	723,174 *(6%)*	Very High
Humid, Semi-Arid	Banadir, Middle and Lower Juba, Middle and Lower Shabelle	2,745,876 *(21%)*	Generally High
Semi-Arid	Awdal, Bakool, Bay, Galgadud, Hiiran, Middle and Lower Juba, Mudug, Middle Shabelle, Togdheer, Woqooyi Galbeed	4,974,588 *(38%)*	Variable (High to Very Low)
Very Arid	Awdal, Bakool, Bari, Galgadud, Gedo, Hiiran, Mudug, Nugal, Sanaag, Sool, Togdheer, Woqooyi Galbeed	4,680,110 *(36%)*	Generally Low

The distribution of disease burden continues to therefore vary according to region and districts even within the strata identified above. There is a clearer stratification that gives different areas different risks as shown in figure 12. There is an inverse relationship between levels of malaria endemicity, and the likelihood of epidemics as modulated by the acquisition of immunity. Populations living in areas of stable transmission to malaria develop immunity early in life due to the high frequency of exposure to infections. Therefore, in areas of stable transmission, the disease is concentrated among children under the age of five years and clinical episodes become rarer with age. It is among populations in unstable transmission, where majority of the infected people are likely to become clinically ill and where epidemics occur.

[33] Fayaz Ahmad; Somalia Malaria Matchbox Review Report 2019
[34] ibid

Within these regions, however, areas where the vector density is likely to rise rapidly or have the weakest health and socio-economic infrastructure, suffer the highest intensity of the epidemics[35].Most parts of Somalia are at risk of epidemics, but the highest risk villages are in northern parts of the country in Somaliland and Puntland. Villages in Central and South are also at high risk mainly around the Juba and Shabelle rivers. At the policy level, there are no populations excluded from accessing malaria services. However, as discussed throughout this document, insecurity, household decision making, poverty, socio cultural barriers and the health system weaknesses all negatively affect the ability of the populations to use these services.

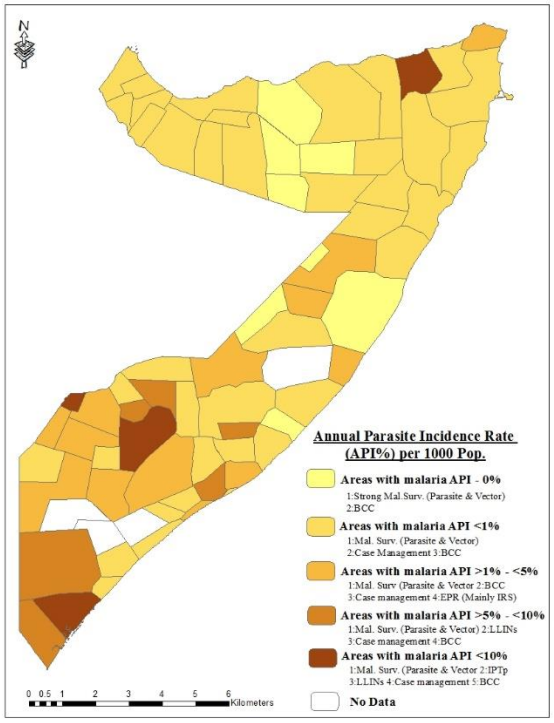


Figure 12: Malaria stratification map 2018

2.4.4 Malaria morbidity and mortality trends

Due to challenges with the HMIS, there is scanty data on mortality attributed to malaria. Overall, the country has had near zero mortality for last five to ten years[36]. The malaria morbidity has not significant changed overall but spikes have been seen at regional levels in 2017 and similar trend expected in 2019 as a result of the heavy rainfall.

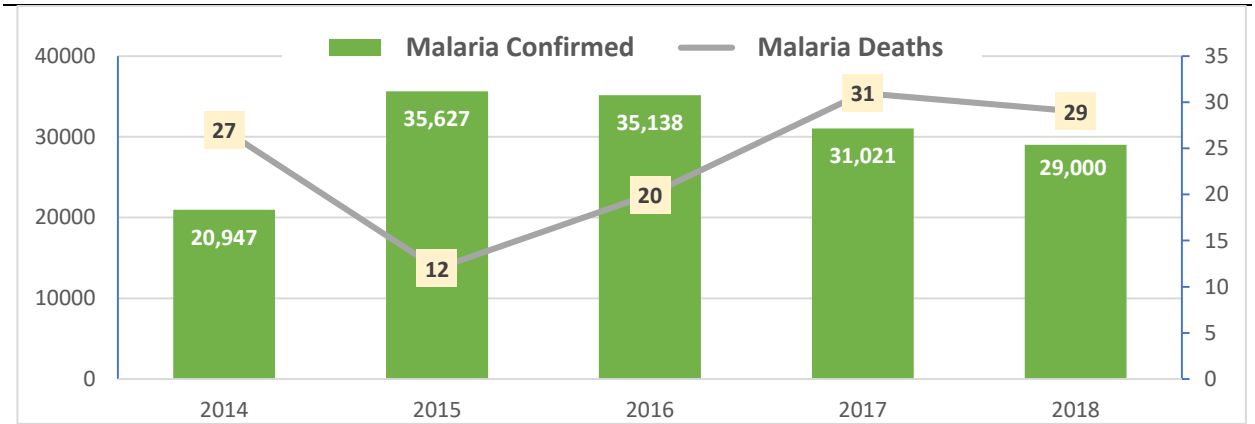
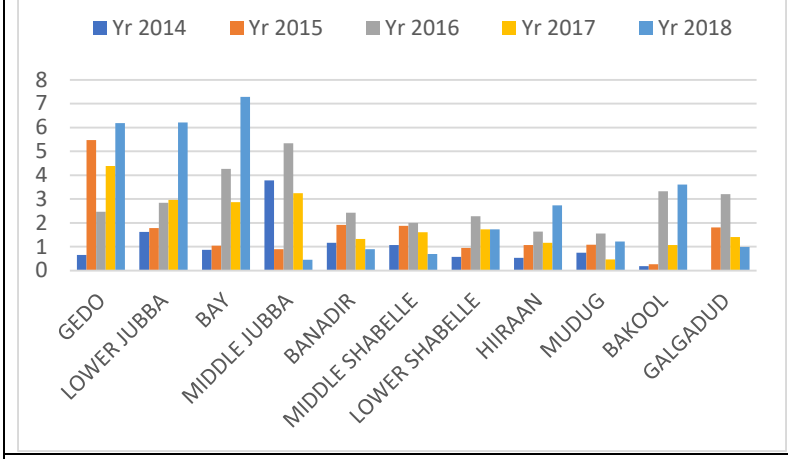


Figure 13: Malaria cases and deaths 2014 – 2018 (HMIS Data)

It is notable that Bari, Gedo, Lower Jubba, Bay, middle Jubba, Banadir, Middle Shabelle, Lower Shabelle and Hiraan regions contributes the bulk of the cases and burden of malaria over the years

[35] Somalia National Epidemic Detection, Preparedness and Response Strategy 2015-2020, p8
[36] 2019 Somalia MPR report 2020

(figure 14). It is evident that within each of the different regions, some districts are responsible for nearly 80% of all reported cases[37].



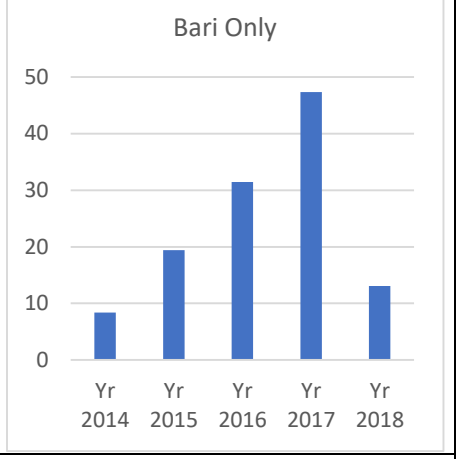


Figure 14: Annual incidence trends for malaria in top burden regions (2014-2018)

It is critical that a strategic shift is adopted to ensure that these high burden regions receive a totally different programming that considers their urgent needs to provide best impact, targeted response and effective mix of interventions. The regions showing incidence below 5 per 1000 population indicates that Mudug, Bakool, Galgadud, Awdal and Karkar require a local stratified response and they have wide variance between them (figure 15).

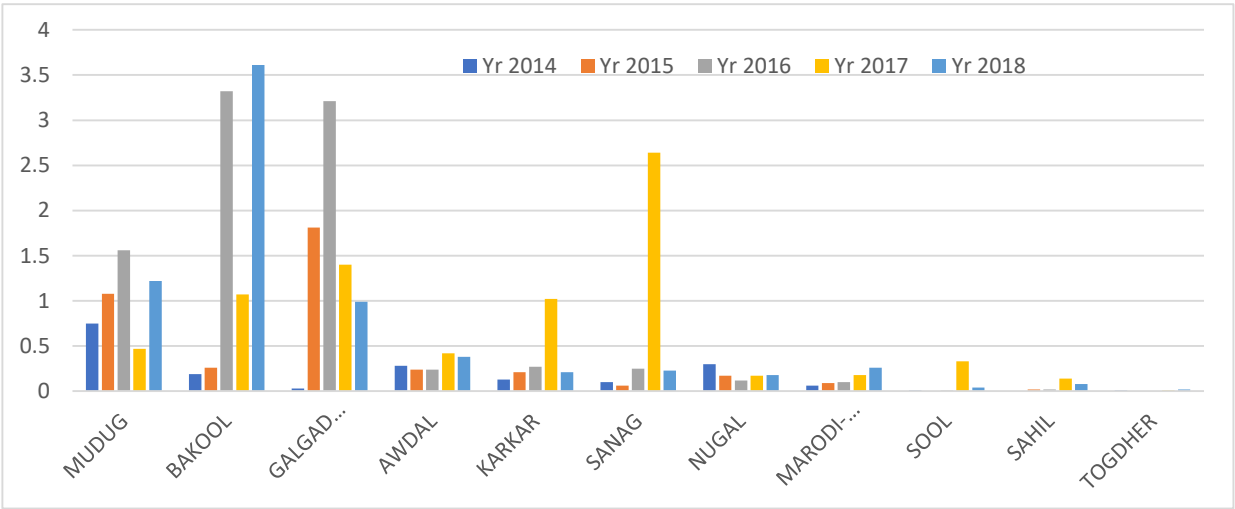


Figure 15: Trends of incidence in low burden regions 2014-2018

This trend therefore points to a critical review and classification of districts based on their epidemiological and entomological situation going forward especially in designing interventions and implementing strategies.

[37] HMIS data

2.4.5 Key malaria interventions in Somali

Somalia maintains the standard and core malaria interventions of vector control and case management with supporting elements. The 2017-2020 malaria strategic plan identified core elements for delivery of the national response and they are: (i) Malaria Prevention through Vector Control; (ii) Effective Case Management through Early Diagnosis and Treatment; (iii) Mitigating Epidemics through Preparedness and Response; (iv) Enabling Behavioural Change Communication; and (v) Programme Strengthening through Health System Developments and Strong Management Structures. It is notable that surveillance as a core intervention as recommended by the WHO Global Technical Strategy for malaria 2016 – 2030 (GTS)[38] remains weakly implemented and mainly as part of the Epidemic Preparedness and Response (EPR) mechanism.

A. Malaria Prevention through Vector Control

Malaria being a vector-borne disease requires interruption of transmission from the host vector (female anopheles mosquito) to the human. WHO approved vector control strategies have been documented as early as the 1960s during a WHO supported malaria eradication project, and in strategic plans from 2006. Since 2016, Somalia considered implementation of the Integrated Vector Management (IVM) approach that looked at comprehensive approach to consider all vectors irrespective of diseases[39]. However, the IVM approach remained extremely challenging due to underfunding, complex implementation environment and lack of appropriate stewardship. In going forward, the NMCP will look at implementing vector control interventions and strategies that focus mainly on malaria. The main vector control approaches applied in Somalia are:

Indoor residual spraying (IRS): the use of IRS has continued mainly as a response mechanism to high transmission, outbreaks and active foci in areas where other complimentary interventions are not fully deployed. IRS has been deployed across Somalia previously for prevention of outbreaks in historically prone foci. Currently IRS is conducted only in areas with an early sign of outbreaks or in response to outbreak with target coverage of at least 85% of households. Deployment of insecticides is guided by the Insecticide Resistance Management (IRM) Plan[40] but actual adherence to it has not been possible as the country has used same insecticide class for nearly a decade[41]. While operational coverages remain very high, actual targets are difficult to determine and furthermore, availability of the chemicals remains challenging following withdrawal of funding for them from the main financing mechanism, the Global Fund. As such, application of intensified IRS in areas showing API above 5 per 1000 population is currently considered impossible until directly defined in the national strategy.

Long Lasting Insecticide treated Nets (LLINs) have been used as key vector control tool since 2003, initially as mosquito nets then later as insecticide treated nets (ITNs) and finally as LLINs in 2009. LLINs are mainly provided through the mass distribution channel with aim of achieving universal coverage with every household having at least one LLIN for every two persons. There is also selective use of

[38] Available from https://www.who.int/malaria/areas/global_technical_strategy/en/
[39] Somalia IVM strategy 2016 - 2020
[40] Somalia Insecticide resistance Management Plan
[41] MPR report

LLINs as part of targeted response especially for refugees, MMPs and IDPs during moments of any humanitarian crisis and in focal areas not targeted for LLINs. There has been varying level of uptake of LLINs by the population including issues of color and shape (conical vs rectangular)[42]. National LLIN distribution guidelines are available and have been updated for current best practice. There is significant gap in implementation of an up to date universal coverage campaign and this will require strengthening in this strategic plan. Routine LLINs continue through ANC and EPI programs.

Larval Source Management (LSM) has been strengthened and implemented in major urban centres where human behaviour especially issues of breeding sites arising from holes dug for water and other human development activities. since 2018, it has been implemented in Bosasso as a main focal intervention to address the increased transmission in areas with challenging water supply. LSM uses mainly bio-larvicides and community led approach to implementation of the activities. there is need to enhance the application to all urban centres as a key complimentary intervention to IRS and LLINs.

Entomological surveillance continues to be strengthened in the country and is conducted on quarterly basis as stand-alone surveillance. The establishment of insectaries and entomological laboratories in Mogadishu, Garowe and Hargeisa has slightly improved the vector speciation, resistance testing and other research with time. However, there is limited laboratory capacity coupled with human resources gaps to conduct full scale resistance testing and other researches.

B. Effective Case Management through Early Diagnosis and Treatment

Somalia has put in place case management capacity as outlined in the national standard treatment guidelines. This involve access to quality assured diagnostics (parasitological tests), prompt access to treatment and targeted implementation of Intermittent Preventive Treatment in pregnancy (IPTp). Malaria is managed at both health facility and in the community. Private sector involvement in malaria case management varies from one region to another depending on the burden of disease. There is strong technical capacity in malaria treatment across the country supported by international development partners. Collaboration between the NMCPs, UN agencies and international and national NGOs is robust. Technical assistance is provided by WHO, funded by the Global Fund through UNICEF, with the adoption of the National Malaria Curriculum for preservice training in 2016.

Appropriate parasitological test has been critical in reducing the cases of clinical malaria and people treated without testing. Since 2006, the country rolled out Rapid Diagnostic Tests (RDTs) as key tool at all level especially with challenging capacity. Microscopy remains gold standard for malaria diagnosis but challenges in having the human resources all over the country remains. Availability of RDTs has improved with less stockouts reported following the increased investment into supply management capacity building by UNICEF, WHO and the Global Fund[43]. Currently there is limited capacity for quality assurance of RDTs in the country and there is heavy dependence on the quality assurance mechanism of the UNICEF procurement mechanism[44]. A HPRP gene deletion assessment was done in 2019 for the country by WHO.

[42] Reference needed
[43] Reference needed with level of stock outs
[44] Reference required. MPR report?

Access to prompt malaria treatment that is quality assured has improved over time since introduction of ACTs throughout the country as part of national strategy. There has been increased use of ACTs and monotherapies were banned. Current malaria Therapeutic Efficacy Surveillance (TES) continues to show low level of resistance. National guidelines are comprehensive and support options for treatment and management of uncomplicated, radical treatment for *P. vivax*, pre-referral and severe malaria.[45]

Intermittent Preventive Treatment in pregnancy (IPTp) has been implemented with use of four doses of Sulphadoxine-Pyrimethamine (SP) given during ANC visits. However, coverage remains low as ANC attendances are also poor in the country. Further efforts need to be made in strengthening IPTp.

C. Mitigating Epidemics through Preparedness and Response

Somalia is prone to disasters and epidemics beyond a single disease. At country level, the national Epidemic Prevention and Response (EPR) implemented under the overarching EPR National Strategy under office of the Prime Minister. The malaria component of the EPR has been guided by the joint Somalia National Malaria Epidemic Detection, Preparedness and Response Strategy 2015-2020 that will require updating. As part of efforts to expedite the scale up of humanitarian response at the height of the threat of famine, OCHA Somalia in 2017 established three Disaster Operation Coordination Centres (DOCCs) in Mogadishu, Baidoa and Garowe.[46] The DOCCs provide linkage between national coordinated and integrated response to crises to the actual need at local level while strengthening linkages with health and other clusters. The malaria component within DOCCs link with the wider NMCP strategies and the overall Integrated Disease Surveillance and Response (IDSR) at ministry of health level.

The EPR approach applies a standardised way for the country to measure data from proposed sentinel surveillance sites and determine when caseloads are defined above historical thresholds (3rd Quartile) to guide when an epidemic is imminent. The improvement and standardisation of malaria case definitions, management and reporting provides underlying confidence in the reported data which determines the basis for which outbreaks and epidemics are reported to the NMCPs. Somalia has a functioning sentinel site surveillance system (CSR), set up by WHO and integrated within the HMIS. The CSR collects data on 14 priority diseases including malaria. The routine surveillance system has continued to be implemented using the *Good Morning report* in low transmission areas that acts as triggers for action. Human capacity exists across all regions for malaria surveillance and outbreak response.

WHO works closely with the Somalia Water and Land Information Management (SWALIM) under FAO, and meteorological warnings through this group provide additional guidance to NMCPs on the probability that climate induced outbreaks will likely occur. In addition to enhanced human resource capabilities, logistical support and annual needs assessments for outbreak/epidemic response measures have improved. The NMCPs routinely forecast for equipment and insecticide needs, should

[45] Somali national malaria treatment guidelines 2016 - 2020
[46] OCHA

rapid field assessments conclude that an emergency focal IRS campaign is required, as part of outbreak/epidemic response.

D. Enabling Behavioural Change Communication

In 2019, the NMCPs in collaboration with WHO and UNICEF commissioned the assessment of needs for malaria communications. This culminated into development of the malaria communications strategy that will guide the joint national approach to effective targeting of malaria messaging, communications and materials development. Malaria control messages and IEC materials will be based on this strategy are expected to be available in Somali and provide a segmented approach (e.g. health facility users, pregnant females etc.) to target appropriate malaria related messages to different demographics of the Somali population. Special focus will be to address the complete Behavioural Change (BCC) for the most at-risk population, MMPs and cross-border issues. Over the years the NMCPs together with WHO and partners developed Information, Education and Communication (IEC) materials primarily focused on local content and geographies. Generally, knowledge about malaria remains low in the population and stronger BCC is required for effective uptake and correct utilisation of malaria interventions.

E. Programme Strengthening through Health System Developments and Strong Management Structures.

To achieve the core functions, a well constituted and resourced program management is critical in delivering a coordinated, technically sound, aligned, integrated and decentralised malaria response. In order to achieve the elimination goal, it is important that the appropriate structure is in place for effective program management. The malaria response across Somalia is coordinated by the National Malaria Control Programs (NMCPs) within Federal, Puntland and Somaliland MoHs who provide the full mandate for a further decentralised programming at district level. Integration of the malaria programme into other health services and decentralized programmes enhanced engagement in malaria elimination by sub-national units and communities[47]. Operational capacity of the programme and the overall health system structure and strength continue to vary with challenges in having the NMCPs fully staffed and as well retaining the critical human capacity. All partners are involved in quarterly review and planning meetings. Coordination is managed through the Malaria Technical Working Group (MTWG) led by NMCPs and supported by Malaria Stakeholders. There has been strengthened government support for malaria control activities and good will and commitment from partners. There are strong partnerships for malaria control including MoH, WHO, UNICEF, donors, implementing partners, among others.

Supply management function has gradually improved with capacity strengthening of all warehouses across the country and enhanced quality of forecasts and procurement plans. Across the country, the Logistics Management Information System (LMIS) continues to be very weak and does not support

[47] Smith Gueye, C., Newby, G., Tulloch, J. *et al.* The central role of national programme management for the achievement of malaria elimination: a cross case-study analysis of nine malaria programmes. *Malar J* **15,** 488 (2016). https://doi.org/10.1186/s12936-016-1518-9

complete visibility of stocks and supply chain data[48]. Currently all NMCPs are not in control of their malaria commodities supply chain and unaware of key processes. Efforts in establishing the logistics units under MoH is expected to provide better results with considerations being made to strengthen capacity at all levels including task shifting. UNICEF and WHO provide overarching PSM support and central warehousing to MoH/NMCPs and implementing partner warehouses, then commodities are distributed directly to health facilities.

Significant investment has been channelled through the Health Systems Strengthening component of the Global Fund grants for the reintroduction of the HMIS in 2009. The country rolled out the DHIS2 aggregator platform and as well with support from WHO developed the malaria database that will be integrated into the DHIS2 as a module by end of 2020. Further significant investment is required to ensure there is improved capture, quality and coverage of routine case reporting through the HMIS and to roll out and deploy DHIS2 routinely as the platform for HMIS data capture and reporting.

[48] MPR report?

3 LESSONS LEARNT FROM NMSP 2017 – 2020 IMPLEMENTATION

Somalia conducted a full Malaria Program Review (MPR) in last quarter of 2019 and completed the external validation in January 2020. The MPR identified the key achievements, gaps, opportunities and made specific recommendations for better quality malaria response in the country. a comprehensive analysis of the Strengths, Weaknesses, Opportunities and Threats (SWOT) were made in the MPR. this section provides a summary of the findings from the MPR and ends with proposed strategic direction that shapes this this national strategic plan. The limitations, barriers and challenges are outlined along with the necessary programme inputs that are required to assist the NMCPs in maximising potential to achieve programme outcomes and impact.

3.1 Epidemiological impact

Plasmodium falciparum is the dominant species throughout Somalia, accounting for more than 90% of infection. *P. vivax* malaria reported from Somaliland and in higher rates in Puntland. *An. arabiensis* is the primary vector responsible for malaria transmission and it breeds in irrigation around banks of rivers and in temporary small and shallow ground pools as well as man-made “barkets”. Malaria parasite prevalence increased from 1.9% in 2014 to 2.21% in 2017. Over the period 2015 and 2018 reported malaria incidence progressed from 1.6 to 2.6 and 2.2 per 1000 population in 2015, 2017 and 2018 respectively with notable variations between regions. Malaria emerged as a public health problem in Bosaso in 2012 and has established itself through the following years. Malaria outbreak reported from Borama district (Somaliland) in 2019.

3.2 Programme management

3.2.1 Achievements

Malaria policy, strategies and guidelines have been updated /developed for case management, vector control, surveillance, behaviour change and communication and epidemic preparedness and response. There is established NMCPs in Somalia with malaria services fully integrated in health system. Public health facilities were surveyed (SARA survey) and similar survey was conducted for private facilities. Both surveys provide a chance for informed steps towards better utilization of malaria services. The malaria curriculum for health institutions was developed in 2014 to sustain the knowledge of malaria and the interventions in country.

3.2.2 Challenges and issues

The review found that some regions in South Central States (SCS) (eg Bakool and Middle Jubba) are difficult to access due to security reasons leading to delivering of services in modalities with increased risk and cost e.g. air transportation. There is high turnover of trained staff. The regional and district health officers are not appropriately enabled and utilized to supervise the malaria case management and to assure provision of quality malaria services. Private sector is not appropriately engaged in malaria case management and other malaria interventions. The malaria programme is mainly

working as project at central level resulting in programme units working in silos without a holistic programmatic approach. There are inadequate funds in a context of overreliance on external support with limited government funding. Population movements within the country and across neighbouring countries resulted in an increased risk of the introduction of malaria, repeated outbreaks of malaria and other vector-borne diseases. Furthermore, it is contributed to establishment of invasive malaria vectors (eg *An. stephensi*) and increased incidence of vivax malaria in different regions of Somalia.

3.2.3 Recommendations

(i) Continue to build capacity including comprehensive training in planning and management of malaria control programmes
(ii) Expand the domestic and international funding portfolio for malaria making use of Roll Back Malaria support to develop a comprehensive investment plan
(iii) Develop private sector engagement strategy for effective delivery of malaria interventions
(iv) Strengthen the capability at district and regional levels to deliver malaria services including supportive supervision and laboratory quality assurance
(v) Advocate for and lead intra/inter-sectoral and cross-borders collaboration for more resilient integrated approach and to reduce the risk of malaria transmission across borders
(vi) Develop a comprehensive approach to improve access of hard to reach population, nomads, IDPs, refugees and returnees to malaria services
(vii) Assess the feasibility of malaria elimination in very low malaria transmission regions

3.3 Vector control

3.3.1 Achievements

A total of 883,231 LLINs were distributed through mass campaigns during 2018-19 covering an estimated total population of 1.8 million mainly from SCS. A total of 68,831, 2,038,381 and 183,629 population in epidemic-prone areas were protected with IRS in 2016, 2018 and 2019 respectively. The programme with the support from partners has strengthened capacity for entomological surveillance and vector control and established sentinel sites for entomological surveillance that include insecticide resistance monitoring. Recent insecticide resistance preliminary data showed that *An. arabiensis* is resistant to pyrethroids in Somaliland (2019) but not in Puntland (2019) and SCS (2018).

3.3.2 Challenges and issues

The current LLINs mass distribution does not address all targeted areas at the same time making monitoring and replacement difficult. Collected entomological data is not enough to inform the programme on the implementation of vector control neither it linked to disease surveillance data for decision making. Irregular and limited insecticide resistance monitoring data and the inconsistent monitoring from the same sentinel sites makes interpretation of results difficult. In malaria-epidemic prone areas, *An. arabiensis* and the recently detected invasive *An. stephensi* as well as other non-malaria mosquitoes (*Aedes aegypti*) breed in man-made water bodies especially 'barkets'. The

programme, however, has not utilized to the maximum the opportunity for larval source management (LSM) especially with community support. No attempts to assess IRS quality in view of continuous use of pyrethroids for many years.

3.3.3 Recommendations

(i) Strengthen vector control units toward the integrated approach for vector surveillance and control
(ii) Tailor vector control interventions to areas where malaria is endemic or emerging.
(iii) Ensure LLIN mass distribution campaign in all the targeted areas at the same time for easier monitoring, replacement and reporting. Also ensure continuous distribution of LLINs through ANC facilities in targeted areas
(iv) Conduct annual routine monitoring of insecticide resistance from the same sentinel sites and use it to inform deployment of interventions as part of insecticide resistance management plan
(v) Generate and use more informative entomological data (Parity rate, EIR) for decision-making on the implementation of effective vector control interventions integrated with other vector-borne diseases
(vi) Ensure equipping entomological laboratories at NMCPs and to identify a collaborating entomological laboratory where preserved mosquito specimens can be sent for further entomological investigations

3.4 Malaria case management

3.4.1 Achievements

Focal persons for malaria case management and malaria laboratory quality control were recruited and supported to oversee the delivery of malaria case management at facility level. Three out of four malaria quality control laboratories are functional. As recommended by the national treatment guidelines diagnostics and anti-malaria medicines are available free of charge at public health facilities through support from The Global Fund. Private sector engagement is piloted in 32 facilities. Health care providers at public health facilities were trained on malaria case management and knowledge of care providers was updated through supportive supervision, distribution of job-aids and guidelines. Therapeutic efficacy of the recommended ACTs was regularly monitored and informed national malaria treatment policy.

3.4.2 Challenges and issues

The review stated that low access to malaria diagnosis and treatment (SARA survey) and the high turnover of trained personnel could affect the delivery of adequate malaria case management. There is high use of antimalarial that are not in national treatment policy including use of artemisinin monotherapy in the private sector especially in Puntland and SCS. Furthermore, the review found that there was no clear instruction regarding diagnosis, treatment and referral of malaria patients at private hospitals and clinics. Due to population movements from countries with confirmed *pfHRP2/3* gene deletion there is a risk of introduction of *pfHRP2/3* gene deletion in Somalia that can create a

potential challenge for malaria diagnosis noting the difficulties in sustaining quality assured malaria microscopy in Somalia. The use of primaquine for radical treatment of *vivax* malaria is limited. There are limited attempts to explore new approaches (eg iCCM) to improve access to communities where coverage with health facilities is low.

3.4.3 Recommendations

(i) Work with related MOH departments and utilize existing networks (e.g. mobile teams, social mobilizers, iCCM) to improve access to malaria case management
(ii) Avail RDT, ACTs, artesunate injection, quinine and microscopy reagents in targeted private hospitals and train and supervise private health workers on regular basis
(iii) Provide clear instructions and SOPs for dealing with suspected malaria cases including referral of patients to private clinics
(iv) Update national treatment guidelines particularly the use of primaquine for radical treatment of vivax malaria
(v) Continue to support malaria microscopy and its quality assurance in hospitals and limited number of health facilities
(vi) Continue provision of quality assured RDTs, for all level of health facilities including hospitals. National malaria programmes with technical support from WHO should establish vigilance system to detect any pfHRP2/3 gene deletion in Somalia
(vii) Continue monitoring of anti-malarial drug efficacy at representative sites in collaboration with WHO
(viii) Enforce ban of oral artemisinin monotherapy
(ix) Provide support to scale up iPTP as part of the ANC services in targeted areas according to the national strategy

3.5 Surveillance, monitoring and evaluation and operational research

3.5.1 Achievements

The HMIS/ DHIS2 has seen major strengthening since its introduction in 2016. Officers at central and regional levels were trained in DHIS2, allowing the country to be more reliably report on malaria cases. The programme conducted two malaria indicator surveys in 2014 and 2017, whose results need to be interpreted carefully bearing in mind their considerable limitations. Several operational researches were carried out including drug efficacy, insecticide resistance, private sector survey and SARA to help inform the programme for better public health impact.

3.5.2 Challenges and issues

The HMIS/ DHIS2 is only limited to public health facilities and does not cover the primary health units and the community levels. In SCS the system is not yet fully functional in all health facilities due to insecurity. Private sector is not captured in the HMIS. The human resource capacity in HMIS/DHIS2 is limited to the central and sometimes regional levels with no focal persons at district level. The limited capacity affects data use and there is also limited feedback and follow-up mechanisms of

recommended action points. The programme has limited capacity in epidemiological analysis to allow better informing of implementation. There is lack of an operational research agenda which is expected to be regularly defined to improve implementation and delivery. DHIS2 and malaria database are not synchronized. Noting the all listed limitation, interpretation of the trend of the malaria burden using reported data by HMIS is a continuous challenge in the country.

3.5.3 Recommendations

(i) Continue to invest on strengthening integrated surveillance and the rollout of DHIS2 to all public facilities, community level and private hospitals to improve the completeness of routine data
(ii) Synchronize HMIS/DHIS2 to malaria database
(iii) Improve data analysis and use at central and district level by strengthening the capacity in epidemiology and by updating malaria stratification,
(iv) Update the GIS shapefiles up to sub-district level
(v) Regularly define and update the programmes operational research agenda
(vi) Recruit and support epidemiologists at central and NMCPs for better understanding and use of data in the planning and implementation of malaria control and elimination efforts

3.6 Epidemic preparedness and response

3.6.1 Achievements

The country has an epidemic response team which is functional and currently has an Early Warning Alert and Response Network (EWARN) which anchors Early Warning Disease Surveillance System (EWARS). The “Good Morning Report” is produced daily at about 10:00 AM outlining the disease situation for all notifiable diseases in Somaliland. The weekly EWARN is functional in 518 facilities in the country and provides a good view of the situation on notifiable diseases in the country. Contingency plans are in place for both Puntland and Somaliland. Buffer stocks of required commodities for effective epidemic responses are not in place but the team use the routinely available commodities for initial response.

3.6.2 Challenges and issues

The epidemic preparedness and response capacity are still limited to a few people and technical areas. No meteorological or vulnerability indicator outputs are defined and recorded. There is also limited collaboration with SWALIM and other government departments. The epidemic thresholds are not developed. There is limited spatial coverage for Early Warning Disease Surveillance to support outbreak/epidemic detection.

3.6.3 Recommendations

(i) Update and use the malaria epidemic thresholds by facility and district
(ii) Strengthen and expand capacity in malaria epidemic preparedness and response to all technical staff in integration with other disease particularly vector-borne diseases

(iii) Strengthen the collaboration between the programme and organisation dealing in vulnerability and meteorological data to ensure timely access to data for malaria epidemic prediction

3.7 Behavioural change communication (BCC) and advocacy:

3.7.1 Achievements

The Malaria programme has developed IEC materials on case management and prevention for increasing utilization on interventions. Community educators were recruited, supported and trained to sensitize community on malaria prevention and treatment at community and facility level. World Malaria Day is commemorated on 25 April every year attracting public, government authorities and social groups. Malaria field days and dialogues with communities on malaria were conducted benefiting influential and social groups.

3.7.2 Challenges and issues

Weak collaboration between different BCC actors at central level limit efficient use of resources made available by partners. BCC team at national and health facility level are not trained and the advocacy and IEC Working Group are not operational yet. Underutilization of existing traditional and technology for BCC like schoolteachers, basic school curriculum, comedians, drama, religion, social media, series film, social media, TV and Radio spots is the common feature. Although some BCC activities were carried out, there is no attempt to monitor the impact of BCC activities. IEC materials and their mode of delivery are not developed based on behavioural situation analysis and they are not targeting certain behavioural goals.

3.7.3 Recommendations

(i) Design and implement Social and Behavioural Change Communication (SBCC) strategy for malaria and other vector-borne disease
(ii) Strengthen the technical capacity of SBCC through training and provision of equipment
(iii) Utilize the traditional schoolteachers, basic school curriculum, comedians, drama, religion, social media, series film, social media, TV and Radio spots and programmes for better uptake of malaria interventions
(iv) Extend the establishment of community educators at all levels

3.8 Strategic Direction from the 2019 MPR

3.8.1 Overall summary of findings from the MPR

Malaria control programmes have been strengthened at national levels and staff for basic programmatic functions recruited and supported to guide implementation of quality assured malaria interventions as per malaria strategic plan. Access to diagnostics, treatment and prevention has been improved and further improvement could be achieved if NMCPs utilize the existing networks such community educators.

Surveillance system has enabled to detect epidemics and emerging malaria problems, but the response carried out in Bosaso and Borama needs to be evaluated for lesson learning. Malaria transmission in Puntland and Somaliland has reduced and cases are concentrated in few districts highlighting the need for targeted and focused approaches for burden reduction and moving toward malaria elimination in phase approach.

Innovative approaches should be explored by NMCPs to address emerging issues such as population movement, ever-growing private sector and larval source management for man-made malaria vector habitats for malaria and other VBDs. The malaria epidemic preparedness and response system should strengthen its linkage toward integration with main-stream epidemic preparedness and response unit in the MOHs. In this regards vector control unit should be strengthened to be able to deal with increasing threat of VBDs particularly Aedes borne disease.

3.8.2 Strategic priorities arising from the MPR

Based on the findings from the MPR and building on the key country context and other evidences, the key and overriding strategic priorities for the strategic plan have been derived. The six strategic priorities are discussed below and will form foundation of the goals, objectives and strategic activities described in the next chapter.

A. Conduct full program reorientation towards elimination in Puntland and Somaliland

Whilst focus was made to introduce implementation of stratified malaria programming in Somalia to have mix of elimination and control in the 2017-2020 MSP, the program re-orientation was not fully done and hence the elimination programming was subsumed into the control that is driven by the burden reduction numbers. Successful implementation of mixed program classification at sub-national level requires a highly targeted and well-defined approaches. Based on lessons from countries that have experienced similar situation, it is critical that in going forward a full program reorientation is conducted to ensure elimination focussed activities and areas are well aligned to the core mandate while not losing focus on control areas. The following key issues must be considered critical going forward:

(i) A full assessment of the feasibility of malaria elimination in Somaliland and Puntland needs to be undertaken across all districts to look at systems, capabilities, transmission patterns and overall risks based on dynamic stratification.
(ii) Make a surveillance (epidemiological and entomological) a core intervention in the malaria program with consideration for active case-based surveillance system in areas targeted for elimination. This should support the capacity for enabled early detection of likely epidemics and emerging malaria problems.
(iii) Update the malaria epidemic thresholds by facility and district and build sustainable requisite capacity for implementation of the same.

B. Deploy interventions and strategies based on evidences

In the highly resource constrained implementation environment, it is evident that blanket deployment of interventions is not just only unsustainable but unlikely to lead to actual intended

impact on the diseases epidemiology and entomology. Targeted responses have already been demonstrated to have impact in Somalia before and it is time to use all available evidences, capabilities and capacities to enhance use of both home-grown evidences and global best practices to drive impact at country level. A review of malaria epidemiology over five years indicate that the selection of interventions can be clustered into district demonstrating very low burden, low burden, medium burden and high burden as illustrated in table 4 below.

Table 4: targeting malaria interventions by burden across all districts of Somalia[49]

Group	API limits	Targetted districts	Priority interventions
Very low burden	Less than 0.5 per 1000 population	Ainabo, Buhodle, Burtinle, El-Afweyn, Erigavo, Eyl, Goldogob, Jariban, Laasaanod, Xaafun	○ Case-based active surveillance ○ High quality EPR ○ Elimination focused SBCC ○ Active case detection, investigation & classification ○ Effective diagnosis and Treatment ○ Larval Source Management ○ Foci investigation and classification
Low burden	0.5 to 1 per 1000 population	Aden-Yabal, Barawe, Benderbayla, Buloburti, Cadale, Garowe, Hudun, Rako, Taleeh, Waaciya, Wanlaweyn	○ Case-based active surveillance ○ High quality EPR ○ Elimination focused SBCC ○ Active case detection, investigation and classification ○ Effective diagnosis and Treatment ○ Targeted LLINs and IRS ○ Larval Source Management ○ Foci investigation and classification
Medium burden	1-5 per 1000 population	All districts not included elsewhere	Mix of interventions based on continuous country level assessments/review based on evidence
High burden – I	>5 per 1000 population but in low burden areas	Adado, Afgoye, Baidoa, Bardhere, Bossaso, Dolow, Jilib, Kismayo, Luuq, Wajid	○ Targeted High quality and full-scale IRS ○ High quality facility case management ○ Routine and mass campaign LLINs ○ IPTp ○ Larval source management ○ Community malaria case management ○ Active surveillance ○ Targeted SBCC
High burden – II	>5 per 1000 population but in high burden areas	Adado, Afgoye, Baidoa, Bardhere, Bossaso, Dolow, Jilib, Kismayo, Luuq, Wajid	○ High quality targeted IRS ○ High quality facility case management ○ Private sector case management ○ Routine and mass campaign LLINs ○ IPTp ○ Larval source management ○ Community malaria case management ○ Passive surveillance ○ SBCC

[49] Based on HMIS data

This approach will allow for tailoring of highly costly vector control interventions to areas where malaria is endemic or emerging while sustaining the gains. In doing this, the NMCPs also must address the quality of data used to inform the regular reclassification of districts across this continuum during entire period of the strategic plan.

C. Strengthen capacity for program management for effective decentralised response

Malaria remains a health systems embedded disease and requires use of available capacities at every sub-national unit. The Regional health Officers and District Health Officers plan critical role in making sure the right health services are delivered. The regional and district health officers are not appropriately enabled and utilized to supervise the malaria case management and to assure provision of quality malaria services. Their capacity to coordinate and ensure effective delivery of malaria services at district level should be built and appropriate tools and other associated arrangement put in place for them to take leadership under a fully decentralised arrangement. This will address partly the issue of malaria programme mainly working as project at central level resulting in programme units working in silos without a holistic programmatic approach.

D. Put in place innovative and sustainable financing mechanisms

A key challenge the malaria program has faced is the limited domestic financing and overall gap in ensuring full scale of primarily critical interventions. There are inadequate funds in a context of overreliance on external support with limited government funding. Decisions on deployment of potent interventions remains hinged on decision of funding mechanisms and not epidemiological and entomological data. In going forward there is need to expand the domestic and international funding portfolio.

E. Address integration and multisectoral programming

Building synergies and an integrated approach to planning and implementation of malaria interventions and activities will be critical if impact is to be realised. It is time to consider integration within the health and non-health sectors that do impact on the malaria interventions. There is need to work with MOH and partners to improve access to full scale of malaria interventions, develop an approach to engage private sector for improved services, and continue working towards ensuring that vector control unit should be strengthen to be able to deal with non-malaria vectors of public health importance.

F. Enhance uptake of malaria services across the country

The glaring gap between the available services and actual uptake requires addressing to ensure that it is not business as usual. Malaria transmission in Puntland and Somaliland has reduced highlighting the need for targeted and focused approaches that bring forth the need for elimination and control areas to have varying BCC approaches. The NMCPs should not just revisit the communication strategies but strengthen continuous use of highly targeted and innovative messaging.

4 NATIONAL MALARIAL STRATEGIC PLAN 2021 – 2025

This section provides the strategic framework and approach for delivering the planned results for the national malaria control and elimination response for period of 2021 to 2025. It provides the central focal point of the how the interventions shall be deployed for maximal impact with the aim on changing the malaria morbidity and mortality situation in the country while building on the strategic information (section 2) and lessons learnt from the implementation of last strategic plan (section 3).

4.1 Purpose

The purpose of this strategic plan is to provide the country directions and implementation strategies to accelerate progress towards malaria elimination so that all efforts by partners are harmonised and tuned towards achieving the National, Regional and Global milestone targets. It is intended to serve as a guide for the development of plans of action at various levels. It is a framework by which annual operational plans should be guided. The NMSP also provides indicative figures on the resource needs for the implementation of the planned activities in a bid to hasten resource mobilization.

4.2 NMSP guiding principles

The NMSP and its subsequent implementation will be guided by the following principles:

(i) Alignment and harmonisation with the National Development Plan, Health Sector Strategic Plans (HSSP) and other national and development plans
(ii) Country ownership and leadership
(iii) Socioeconomically inclusive, equitable and coordinated partnership cognisant of gender
(iv) Mutual accountability (management and financial) and Value for money
(v) Evidence-based and results-oriented management
(vi) Integration and sustainability

4.3 Vision, Mission and goal

4.3.1 Vision

A malaria free Somalia population which contributes towards further social and economic development and growth across the nation.

4.3.2 Mission

To provide, promote and advocate for equitable, comprehensive, cost effective, efficient and quality malaria control and elimination services for entire Somalia by ensuring transparency, accountability, client satisfaction, community ownership and partnership.

4.3.3 Goal

To attain zero malaria death and reduce malaria incidence to at least 0.5/1000 population by 2025.

This will be achieved through:

i) Ensuring that there is interruption of local Plasmodium falciparum transmission in at least 45 districts of Somalia targeted for elimination.
ii) Supporting 55 districts to implement malaria elimination (malaria incidence <0.1/1000 population) by 2025; and
iii) reduce malaria cases by 75% by 2025 in the top 10 high burden districts

4.4 Overarching Strategic Pillars and objectives

4.4.1 Pillar 1: Universal access to appropriate malaria interventions and services

The objective of this pillar shall be: "***By 2025, 100% of population at risk of malaria is provided with appropriate malaria prevention and case management services***".

This pillar brings together all services related to malaria prevention, case management and behavioural change communication under one objective and aims to reduced siloed internal program planning, implementation and reviews. It considers the interconnected nature of the different malaria interventions with focus on impact.

4.4.2 Pillar 2: Accelerate towards malaria elimination

The objective of this pillar shall be: "***By 2025, at least 45 districts of Somalia shall be reporting zero local transmission of malaria***".

Acceleration towards malaria elimination requires that differentiated efforts are made to provide tailored interventions based on needs and disease epidemiological and entomological profiles. This pillar is purely about efforts to introduce and strengthen capacity and approaches to accelerate the malaria elimination agenda in Somalia.

4.4.3 Pillar 3: Enhanced Strategic Information generation and use

The objective of this pillar shall be: "***By 2025, malaria M&E, EPR and surveillance capacity is enhanced to provide the required national strategic information for decision making***".

Application of evidences requires that the quantity and quality of the evidence generated is made available at right time for the requisite capacity to utilize it optimally. This pillar focusses on how the data and other evidences shall be turned into strategic information to drive impact.

4.4.4 Pillar 4: Enhanced program enabling environment

The objective of this pillar shall be: "***By 2025, the enabling environment and systems for malaria response in Somalia are optimally functioning***".

Sound enabling environment consisting of appropriate program management, resources mobilization, commodity security, effective hardware, stewardship, among others is critical for the full delivery of results. This pillar focuses on making the environment conducive for results.

These pillars all combined provide the combinations that to a greater extent mirrors the key pillars of the WHO GTS but more importantly brings forth the focus on provision of highly integrated malaria response in the country without the routine siloed approach.

4.5 Pillar 1: Universal access to appropriate malaria prevention and case management services

4.5.1 Objective of the pillar:

"***By 2025, 100% of population at risk of malaria is provided with appropriate malaria prevention and case management services***".

4.5.2 Preamble and Guiding principles

Malaria prevention, diagnostic and treatment services should be provided in full scope and scale for the targeted and appropriate population that needs them. There is need to strengthen the linkages and comprehensive approach to services if the malaria morbidity is to be impacted on. Over the years, coverage of vector control has not been up to scale due to challenges with financing and most decision on which intervention and strategy for their deployment remained based on resources envelope[50]. The insecticide rotation has not been possible and as such the country has used same insecticide for nearly 9 years with risk of resistance[51]. The use of LLINs remains low and it is difficult to fully ascertain the actual numbers and their durability within the communities[52].

The adequacy and effectiveness of the services remains a major bottleneck in this regard is the utilization of public sector health facilities which is only 20% in Somalia, (17% in rural areas, 10% in Nomadic and 12% in IDPs)[53]. So even if the malaria diagnostic and treatment services are extended to all the health facilities, it still will not be able to reach a major portion of Somali population. For this purpose, the acceptability of the services must be improved at the same time with improvement in the access. Similarly, in such resource limited settings the resources should be spent equitably.

This pillar addresses the malaria from three perspective of prevention, treating and mitigating infections in humans and managing human behaviour towards accepting and utilisation the interventions. Prevention will focus mainly on the level of the vector particularly the prevention of vector entomological inoculation of potential human targets, interruption of vector multiplication and managing the parasite in pregnancy hence preventing risks to the unborn child. Treating and mitigating the infections in human host will focus on appropriately diagnosing the infection and providing prompt treatment with focus on attaining radical cure. The prevention and treatment are highly interlinked by need for appropriate behavioural change for acceptance, uptake and use of the available tools and interventions.

[50] Somalia Malaria 2019 MPR report page 24.
[51] Ibid, page 33
[52] Ibid, page 34
[53] 2019 Somalia Malaria Matchbox analysis report, page 31

4.5.3 Component 1.1: Vector control

Vector control remains the key approach to ensuring there is interruption of both anopheline oviposition and transmission in between vector and host, while maintaining appropriate environmental compliance. Integrated Vector Management (IVM) emphasizes the importance of a rational decision making process to optimize the use of resources for vector control by re-orienting the way vector control programmes are planned, implemented and evaluated, to improve their efficacy, cost effectiveness, ecological soundness and sustainability. Implementation of IVM approach in Somalia has been challenging due to lack of adequate resources, inability to attain common framework at national level, and other institutional challenges[54] despite the country having several vector-borne diseases (malaria, dengue, chickungunya). In this strategic plan, Somalia malaria program will focus on malaria specific vector control in order to accelerate the pathway to elimination (pillar 2) and address the focal issues for the malaria programs. The principal vector *An. Arabiensis* has a propensity to both bite and rest outdoors at times when persons at risk are not sleeping and therefore vector control should now include strategies for both indoor and outdoor prevention. This and other vector species also can breed in man-made larval habitats that are common throughout Somalia, such as Birkits, Wars, Bulleys and irrigation canals/wells.

Current insecticidal based interventions therefore may have limitations in how well they prevent this vector from biting, as their mode of action (personal / community protection for LLINs) and mass-effect on indoor resting populations (IRS) relies on vectors coming into contact with the insecticide inside the house. Locally applicable or community-based interventions should be addressed for their feasibility as part of an IVM strategy that provides impact on malaria but also indirectly to other local vector borne diseases. Such interventions should also be evaluated for their suitability to provide personal protection for seminomadic pastoralists as they could be a driver for importing cases into receptive foci which may have interrupted local transmission.

Somalia developed the national Insecticides Resistance Management (IRM) Plan 2016 – 2020 aligned to the Global Plan for Insecticide Resistance Management in malaria vectors[55]. However, the actual implementation of this IRM plan has been highly challenging. Evidences on actual vector resistance patterns in the country remains weak with lack of comprehensive entomological monitoring systems inclusive of functional insectary, entomological laboratory and adequate human capital for entomology at the key levels. Central to this strategic plan in strengthening of overall entomological surveillance as part of wider surveillance systems (pillar 2, component 2) that will directly complement the approaches for vector control here.

To maximise and sustain impact from vector control, given the level of financial investment, Somalia adopts the principle of universal access to coverage to higher risk populations. The priority under this strategy should be in providing levels of access where universal coverage is achievable. The scale-back of vector control interventions in areas that have received universal access is not recommended, even if transmission has declined, as discontinuation would confer a high risk of malaria resurgence.

[54] Somalia Malaria 2019 MPR report page 34.
[55] WHO, 2012; Global plan for insecticide resistance management in malaria vectors. Available from https://www.who.int/malaria/publications/atoz/gpirm/en/. Accessed March 6, 2020

Given the level of transmission across the country, the level of investment required to drive high quality Integrated Vector Management programmes and the current susceptibility profile of local

vectors to pyrethroids, the NMSP does not recommend for the combination of LLINs and IRS together for large-scale programming until such a time as when robust insecticide resistance monitoring data indicates IRS with non-pyrethroids would be beneficial as part of an insecticide resistance management strategy[56] and based on best global guidance[57]. The country will consider in areas where transmission has been interrupted, the scale-back of vector control shall be based on a detailed analysis that includes assessment of the receptivity and vulnerability, active disease surveillance system, and capacity for case management and vector control response[58]. Vector control strategies/interventions deployment shall be based on the indicative localities described in figure 16.

The key vector control interventions in addition to firm entomological monitoring (covered under pillar 2 as enhanced surveillance) shall include IRS, LLINs and effective larval source management. These interventions are described here below.

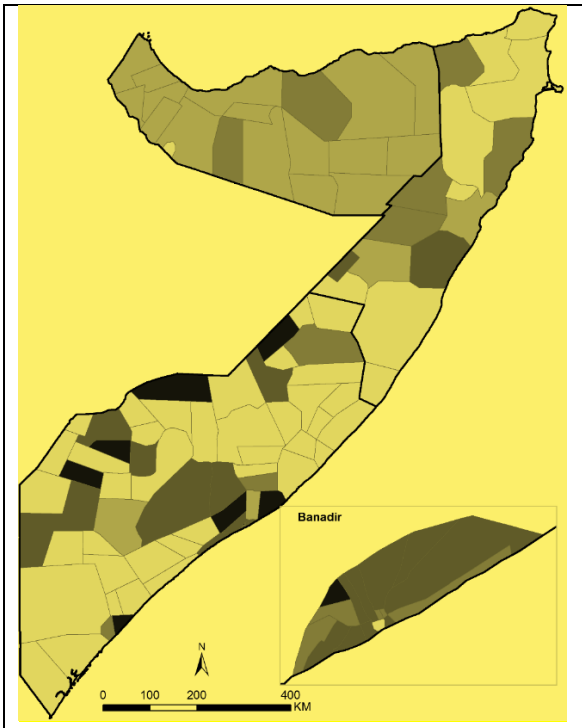


Figure 16: Malaria Vector Control interventions deployment (placeholder map to be replaced, map may become multiple)

4.5.3.1 Strategy 1: Deploy high impact IRS

Despite being considered highly costly, IRS remains the most highly impact vector control approach that requires much less of behaviour modulation in countries accelerating to malaria elimination. In this strategic plan, the country will enhance quality of coverage with IRS focussing on ensuring effective targeting, appropriate quality of spray operations, better use of entomological evidence and stronger adherence to the IRM plans[59]. IRS will be used on full scale in the districts of Bossaso, Borama, Rural Hargeisa, Baki and Gabiley for firs two years transitioning to LLINs in the third year onwards. In all districts having API of <1/1000 population but greater than 0.5/1000 population, IRS will be used as the predominant respond intervention to any high transmission area supported by either LLINs and/or LSM depending on the ecology and environmental situation.

[56] Somalia IRM plan 2016 – 2020.
[57] WHO, February 2019; Guidelines for malaria vector control; page 30. Available from https://www.who.int/malaria/publications/atoz/9789241550499/en/. Accessed March 4, 2020
[58] Ibid; page 31
[59] Somalia IRM plan 2016 – 2020.

According to MIS results, the wall material used in construction of the houses could be divided in 4 categories: a) brick/stone/cement, b) iron sheets, c) mud, or d) thatched/traditional houses. Out of the 7,033 households, 35% houses were made of brick/stone/cement, 28% used iron sheets, and 24% were made of mud. About 15% of households were made of thatch or traditional housing materials. Households from Puntland (68%) and Somaliland (54%) were more likely to live in houses made of brick/stone/cement compared with South Central, where only 14% of households reported living in houses made of bricks and cement. Households from Bay, Bakool and Gedo regions were likely to live in houses made of thatch or traditional Somali huts, compared with other regions. These will be expected to provide some challenges to IRS. In the planning for IRS, these structures will be considered on case by case on enumeration of households. The data also highlights the unequal distribution of these features among rural, urban, IDPs and nomadic populations, alluding to the link between poverty, displacement and household structure which predisposes its occupants to mosquito bites and malaria[60].

The selection of insecticide class will be based on resistance profiles in vectors from sentinel site surveillance while considering the need to balance between newer tools and mix of old tools that are still highly potent and available for use at country level. Health facility epidemic surveillance reporting from continual monitoring of vulnerability criteria outlined in the Somalia National Malaria Epidemic Detection, Preparedness and Response Strategy 2015-2020, should form the basis in which to mount a rapid IRS response within 2 weeks of detection. Village based risk assessments has mapped villages in Somaliland, Puntland and Central parts of SCS that are continually prone to outbreaks and are vulnerable to epidemics. The districts in which these villages are located and are therefore on high alert for annual IRS campaigns are highlighted in Figure 16. Standard Operating Procedures (SOPs) in accordance with the national IRS implementation guidelines and judicious use of insecticides will form the basis of mounting an effective IRS campaign. If an IRS response is required, at least 85% of targeted households will require spraying for the campaign to be effective. As such, IRS will need to be combined with community mobilization as part of ongoing IEC campaigns to ensure maximized compliance in foci that may have not received routine IRS previously.

4.5.3.2 Strategy 2: LLINs

LLINs will be prioritised for areas with low transmission, those having IRS withdrawn and in situation of responses to epidemics. Pyrethroid impregnated nets will be preferred and in areas where there is evidence of resistance, Piperonyl Butoxide (PBO) LLINs will be distributed on case by case basis. It is estimated that about 10% of all LLINs shall be PBO. The country will use both mass campaign and routine/continuous distribution channels for delivery of LLINs. Quality assurance of LLINs procured will be done to ensure the nets are of the acceptable quality for the targeted communities; WHO quality requirements shall form basis for selection of the LLINs. The National LLIN Strategy 2017-2020 serves as guidance, on which the targeted delivery of LLINs of preferable size/colour to districts with a continuous *P. falciparum* parasite prevalence of >1% will be based.

[60] NMCP (2018), p30

Mass LLIN Distribution:

Mass distribution campaigns will be conducted every three years in a rolling campaigns approach conducted annually to replace LLINs due for that particular year. To support this strategy, micro-planning and stratification of targeted villages and districts will be done. In every campaign cycle, a district will be fully covered to provide for effective estimation of administrative coverage and future campaign planning, LLINs durability assessments and other follow-up exercises. The micro-planning will inform the selection, quantification and procurement of the requisite LLINs and enabling commodities. The distribution will be done to ensure universal coverage of targeted populations at risk, including boarding schools and admitting health institutions, special populations in the targeted areas. Before LLINs mass distribution the following key activities will be undertaken, selection and procurement of LLINs and distribution commodities, stakeholder's sensitization meetings. Capacity building (orientation/training meetings) for LLINs managers and distributors (EHTs, nurses and VHWs), including training on gender equality in malaria, will precede distribution campaigns.

Household registration (door-to-door) will be done to take stock of the actual quantum required by each distribution point and this will inform distribution logistics for the campaign. These activities will be enumerated in the updated implementation guidelines for LLINs mass campaign effective 2021. Distribution of LLINs to beneficiaries and net follow up campaigns will be done in compliance with national policy and guidance from the national LLIN distribution plan. Detailed situational analysis will be done and mass LLINs distribution will also be considered in cases of humanitarian emergencies (internally and externally displaced communities), active foci responses in elimination areas, prisons in high burden areas and populations engaged in special nocturnal occupations.

Continuous LLINs Distribution

The purpose of Continuous distribution is to maintain universal coverage. This intervention will be delivered through three main channels, namely, first Antenatal Care (ANC) visits, Expanded Programme on Immunization (EPI-targeting initial measles vaccination), and community channels. For the community channel, community-based health workers will issue coupons to households that need replacement of the LLINs for redemption at health facilities, outreach points. Delivery to special households (e.g. elderly, those living with disabilities) by health workers will be done. The principal activities will be selection and procurement of LLINs, stakeholder sensitization, training of health workers and village health workers, delivery and pre-positioning of LLINs, and distribution to beneficiaries. Monitoring distribution processes and quality data verification and spot checks will be conducted to ensure transparency and accountability in the distribution process. An assessment will be undertaken in order to fully identify shortcomings in logistics and supply chain and to fully integrate CD inventory counting into facility-level tools which has often provided insufficient routine data on CD channel uptake.

4.5.3.3 Strategy 3: Effective Larval Source Management

Larval source management will be implemented as a complementary intervention in all areas targeted for IRS, LLINs and elimination settings. The intervention will be implemented in xx districts. Environmental health practitioners will receive trainings on larviciding. The National office will

coordinate quantification, procurement and distribution of larvicides Supervision and support visits will be conducted from all levels. For effective and sustainability of larval source management, the community will be engaged to assist in identifying of breeding sites. Selected community volunteers will be trained in the application of the larvicides, monitoring and documentation.

4.5.3.4 Strategy 4: Personal Protection

Target populations include people living in non-sprayable structures, overnight farmers, MMPs, miners, fishermen/women and truck drivers. This intervention will also aim at reducing residual transmission. The strategy proposes the provision of free or subsidizes repellents, toxic sugar baits and house screening. The private sector, business communities and community-based organisations will be engaged to add value on the provision of articles.

4.5.3.5 Vector control objective:

The objective of vector control shall be to "***ensure that at least 100% of population at risk in targeted areas is protected with access to appropriate and quality assured vector control interventions annually***."

4.5.3.6 Vector control core activities:

The core activities shall consist of the following:

(i) Update the national malaria vector control strategy to align with best practices.
(ii) Update the LLLINs mass campaign and routine distribution guidelines to align with the newer strategies and approaches.
(iii) Attain and sustain universal coverage with LLINs by implementing LLIN Mass-Distribution every 3 years (until LLIN Longevity determines otherwise) and by maintaining coverage through the continual delivery of LLINs through post-natal care in targeted population risk groups.
(iv) Conduct a National Level Intersectoral Workshop to mobilise traction behind implementation of an IVM strategy in Somalia and to provide an operational plan for its implementation between 2017 and 2020, to stimulate advocacy amongst regional donor partners.
(v) Conduct Re-active based IRS campaigns in targeted districts based on strengthened surveillance measures that accurately capture vulnerability to potential outbreaks/epidemics, as outlined in the National Malaria Epidemic Detection, Preparedness and Response Strategy. Effective campaigns will rely on ensuring well-trained stand-by teams are in place, with proximity to at-risk villages and that ≥85% of target households have been sprayed in accordance with SOPs.
(vi) NMCPs should work with technical partners and SWALIM to better utilise known mapping locations of Berkads, Hand-dug wells and Ponds as a starting point for Larval Source Management as part of IVM and as a way of potentially using such locations as a way of reaching out to provide vector control options to Semi-Nomadic Pastoralists who may use such water providing spaces.
(vii) Community mobilisation and awareness of malaria prevention (detailed activity will be linked to the BCC component).

4.5.4 Component 1.2: Malaria case management

Provision of prompt treatment to all parasitologically diagnosed malaria cases is a critical in ensuring that the parasite reserves in human are fully cleared with treatment that provides radical cure. In Somaliland and Puntland, majority of cases are seen in the public health facilities and PHUs while private sector is more pronounced in South Central Somalia. Treatment guidelines are updated based on results of drug efficacy monitoring using the WHO protocol to ensure treatment regimens remain effective under the threat of emerging resistance. To ensure effective malaria case management for all patients, as well as accurate malaria surveillance, Somalia will take a "total health system" approach. This requires: 1) an understanding of the coverage and quality challenges in all provider types, and 2) strategies designed to address these challenges, while considering the relationship between sectors, and the fit with the broader health system environment. In considering the concerns mentioned, we also need to evaluate whether each element of appropriate care is better tackled as malaria-specific private sector initiatives, or with cross-cutting or "horizontal" system-wide interventions across many disease areas.

The Primary Health Units are widely distributed in Somalia but have minimal services availability and readiness. Distance and security situation are the two main barriers for accessing health care. Besides, most of the community health workers and at the facility level are male, a third of them are working as volunteers with no salary, 90% have experience of less than 3 years[61]. The utilization of public sector facilities is also quite low (overall 0.23 visits per person per year in comparison to optimal utilization rate of 5 visits per person per year[62]. Public facilities are open for approximately two hours per day, compared to private pharmacies which open for 11 hours per day. The short opening hours in the morning (when most women typically have other work) is without doubt a barrier to access for potential users[63]. Case management will involve the following interventions:

4.5.4.1 Strategy 1: Diagnosis

All malaria cases countrywide should be confirmed by either microscopy or RDT in public and selected private HFs. Microscopy remains the gold standard for diagnosis of malaria and will be made available at the health centre, referral health centre and hospital level. RDTs will be available at all levels including selected private sector laboratories, but will be prioritised for PHUs and CHWs as they will form the mainstay of diagnosis at this level and for surveillance detection programmes at community level (Active / Passive Case Detection) in areas with consistently low-levels of transmission (Incidence <1 per 1000 population in the last 3 yrs.).

Laboratory personnel shall undergo the External Competency Assessment of Microscopists for Malaria (ECAMM), training on QA guidelines and internal competency trainings to build local expertise. Testing facilities shall participate in a routine local microscopy proficiency testing program with national laboratories participating in regional ones. Routine on-site training and supportive

[61] Save the Children. (2018). Community Health and Social Accountability in Somalia Programme (CHASP): Findings from Literature Review and Baseline Data. Save the Children Somalia and Somaliland.
[62] WHO, (2016)
[63] Mazzilli & Davis, 2009, p21

supervision shall be conducted for external assessment and capacity building. Quality of the RDT kits and reagents shall be monitored upon receipt and throughout the supply chain through lot-to-lot testing and post market surveillance respectively. Processes to establish a national slide bank shall be commenced to help in improving quality of diagnosis.

Diagnostic capacity will be maintained through refresher training at previously trained facilities and enhanced training will be given to new facilities and extended to PHUs and CHWs. Additionally, quality control laboratories will provide a feedback loop on cross-checked slides and conduct on-site guidance from routine facility visits during supervision using revised and updated quality control feedback tools. Standardised Operating Procedures (SOPs) will be deployed with appropriate job aids, catering to the needs of diagnostic technicians at the hospital level down to CHWs attached to PHUs. Programmes will work with the private health sector to ensure that SOPs are being utilised in private laboratories in accordance with national guidelines.

4.5.4.2 Strategy 2: Provision of prompt and quality assured malaria treatment

An efficacious ACT will be used countrywide as per the national treatment guidelines for the 1st line antimalarial treatment of uncomplicated *P. falciparum/P. vivax* malaria. National Treatment Guidelines compliant with global recommendations based on clear country evidence and rationale from regular antimalarial efficacy monitoring, will also serve to guide for the appropriate management of severe malaria, treatment of pregnant females and any special risk groups such as Internally Displaced People / Semi-Nomadic Pastoralists.

Additionally, the National Treatment Guidelines also recommend for the radical treatment of any confirmed *P. vivax* cases and the inclusion of an appropriate gametocytocidal therapy as part of case management; to reduce reservoirs of infection and limit receptivity in highly focal transmission settings. Adherence to testing and treatment protocols will be enforced through clinical mentorship trainings and on job support visits by the district team to health facilities. Engagement of the private sector shall be scaled up through training of private health workers in case management and institution of public private sector partnerships. A therapeutic efficacy study to monitor efficacy of first line treatment will be conducted every 2 years using the WHO therapeutic efficacy protocol to measure the clinical and parasitological efficacy of ACTs in uncomplicated malaria patients. To help capacitate health facilities to effectively manage severe malaria cases the program will support and contribute to the supply of some key medical commodities. An independent malaria case management audit covering all public and private health facilities will be conducted every two years.

4.5.4.3 Strategy 3: Selective IPTp3

Intermittent Preventive Treatment of pregnant women (IPTp) is included as part of focused antenatal care, but, will be strictly limited in high endemic districts in SCS. Within the lifespan of this NMSP, the intervention will be reviewed for its cost effectiveness in terms of the additional protective efficacy it brings to pregnant women in this transmission setting. WHO Recommendations will be adopted and cross-partner focus will prioritise increasing pregnant women contact with health-care providers during pregnancy (minimum of 8 contacts). It is envisaged increasing contacts will increase adherence

to IPTp with sulfadoxine-pyrimethamine (SP) at least three times in the second and third trimester of pregnancy. The NMCP with technical partners will be responsible for updating guidelines and job aids on IPTp3 and provide orientation to health workers on updated IPT guidelines, producing integrated data collection tools for MIP, mobilizing communities to enhance antenatal care attendance in collaboration with partners.

4.5.4.4 Strategy 4: Strengthen Community case management

Trained Community Based Health Workers (CBHWs) improve access to malaria diagnostic and treatment services in hard-to-reach areas. Village health workers (VHWs) will be trained in community case management (uncomplicated malaria and prereferral treatment with rectal artesunate). There will be enhanced use of community level actors to reinforce the use of the good morning reports. Those trained in preceding years will be offered a refresher training. The logistics system will be rolled out after the pilot during the period. The CBHWs will receive medicine boxes for storage of medical supplies. They will also receive other sundries and uniforms. Peer to peer VHW support will be undertaken in some districts to enhance quality diagnosis and treatment.

4.5.4.5 Case Management Specific Objectives

The specific objectives shall be:

(i) All suspected malaria cases in public health facilities countrywide are diagnosed using RDTs or microscopy and are reported through the HMIS.
(ii) 100% of Malaria cases in public health facilities countrywide are treated according to the national treatment guidelines.
(iii) At least 90% of targeted private health facilities countrywide are to provide effective case management according to the national treatment guidelines.
(iv) At least 80% of pregnant women in targeted areas receive at least 3 doses of IPTp SP

4.5.4.6 Core Activities

(i) Procure and deliver approved quality assured RDTs (Pan specific for P. f & P. v) to public health centres, PHUs/community levels and selected private health centres, and microscopes/diagnostic reagents to newly established health centres and hospitals, as part of a continuous integrated LMIS supply chain.
(ii) Procure and deliver approved quality assured ACTs and other antimalarials for the treatment of uncomplicated/severe malaria to public health facilities and health centres as part of a continuous integrated LMIS supply chain.
(iii) Conduct routine antimalarial efficacy studies based on WHO protocols in functional sentinel sites for currently recommended antimalarials and any viable alternatives, given a scenario when resistance is a growing threat. Collaborate with a regional WHO collaborating centre to ascertain PCR-corrected treatment failure and to ascertain any molecular markers associated with resistance.
(iv) Conduct malaria case management audits every two years to inform malaria services quality.

(v) Provide annual Training of Trainers (as part of an integrated training package) on malaria case management, diagnosis and microscopy-based quality control.

(vi) Cascade annual training / refresher training for health cadres across the range of public health facilities on case management (uncomplicated and severe malaria), diagnosis and microscopy-based quality control.

(vii) Conduct the annual External Competency Assessment of Microscopists for Malaria (ECAMM) for laboratory personnel

(viii) Engage with selected private sector pharmacies and clinics to advocate and train for increased quality of diagnosis and treatment of malaria in accordance with national guidelines.

(ix) An IPTp3 impact assessment needs to be conducted to provide a local evidence base on which to support the implementation of this strategy, and to determine in which ANC health facility catchment areas the continuation of IPTp3 would be most beneficial (e.g. ≥10% prevalence).

4.5.5 Component 1.3: Behavioural Change Communication

Strategic communication to facilitate and sustain changes in social norms and behaviours is integral to malaria control programs and supports all other interventions. There were notable gaps in SBCC as outlined in the 2019 MPR and this continues to affect the uptake of malaria interventions even when adequately available. In moving forward in this strategic plan, malaria SBCC will ensure that: (i) the messages and approaches are evidence-based, (ii) theoretical foundation and cultural considerations are embedded in the activities and materials, (iii) integrated and system based approach to SBCC, and (iv) tailoring of SBCC to country and sub-national contextual issues including issues of elimination. The integration of high quality social and behaviour change communication (SBCC) into malaria strategic plans is essential in order to reach targets to prevent, treat, control, and eventually eliminate the disease. Ensuring that evidence based SBCC is positioned as a core component of global and national malaria control policy and is allocated the resources necessary will contribute to reducing the impact of malaria on broader health sector and national development directions. SBCC activities will vary depending on the nature of the behavioural and normative challenges associated with interventions tailored to areas of varying malaria transmission, and for specific populations and specific contexts. The country will utilise the three levels of consideration (Figure 17) during planning, delivery and evaluating all SBCC activities to ensure they are aligned to global best practices and programming. There is often a low risk perception amongst low transmission areas despite such populations being vulnerable to outbreaks, if not, epidemics. This can lead to poor health seeking behaviours, ineffective management of infections and low uptake of LLINs. Communication interventions will support adoption of appropriate and sustained practices amongst the population, and in doing so, will

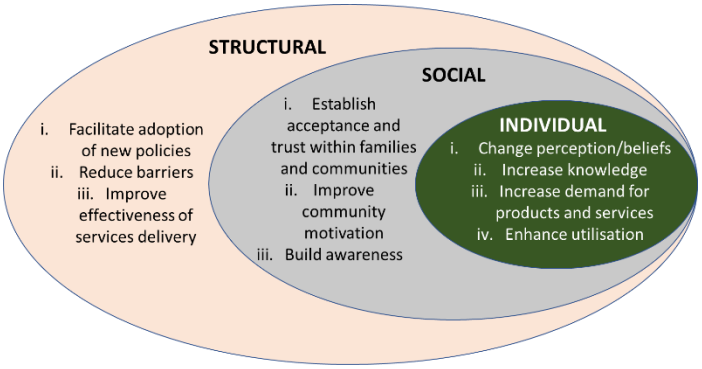


Figure 17: Consideration Levels for malaria SBCC

maximise the potential impact from investment in other NMSP strategies. The overall malaria SBCC shall be guided by malaria communications strategy for Somalia. The key interventions are:

4.5.5.1 Strategy 1: Higher Level Advocacy for Malaria

If the expectation is that communities and individuals should adopt evidence-based practices and utilisation of malaria prevention interventions, this needs to be resonated at all levels. More political commitment and higher-level visibility needs to be attached to control and elimination of malaria in Somalia, and the benefits this can bring to country development overall. There needs to be an organizational structure that supports this endeavour to ensure that there is a multi-sectoral approach that translates the vision of a malaria free Somalia to the population.

4.5.5.2 Strategy 2: Mass Media and Community Based Interventions

Somalia has a young and dynamic population. There is a broad socio-economic demographic, with those in urbanised areas who are literate and social media adept, to rural populations with a low literacy rate. As such, the communication strategy for BCC needs to use a multichannel approach. Further, under a multi-partner collaboration, the successive communication strategy also needs to explore more the variance in transmission across different parts of the country and the risk this implies from an individual perspective against the actual risk, and address more nuanced messaging in a segmented way to target audiences.

4.5.5.3 Strategy 3: Empower communicators and strengthen interpersonal communications

Given the remoteness, associated nomadism, displacements and the vulnerable security situation across many settlements in Somalia, village-based initiatives for BCC should be promoted as they are locally owned and locally delivered. They can offer a sustainable solution (when coordinated efficiently) for effective communication as they are peer-based, thereby likely increasing uptake for positive behavioural changes. A range of interactive sessions, including community focus-group discussions, home visits, water-point discussions and drama sessions, should be implemented on a continual basis and should be appropriately timed to intervention delivery (e.g. LLIN Community Mass Distribution). In this strategic plan the use of pre-recorded messages for use at village gatherings and events shall be piloted and scaled up.

4.5.5.4 Specific Objectives

The specific objectives for SBCC are:

(i) At least 90% of the population seek diagnosis and treatment within 24 hours from fever onset
(ii) At least 90% of the population is utilising appropriate vector control measures.

4.5.5.5 Core Activities

(i) Redesign malaria messages and IEC materials to align with the new malaria communications strategy for Somalia considering the sub-national differentiation. Develop a suite of

complementary IEC materials based on the target delivery (e.g. job aids / guidelines for health facility personnel, posters for health facilities /public spaces and buildings).

(ii) Customise and roll out the zero malaria starts with me campaign for Somalia and conduct national launch and cascade events to local levels.

(iii) Develop on annual basis social media packages and communications materials for use and dissemination across the country.

(iv) Conduct regular Mass Media communication delivery through a multichannel approach (e.g. Mobile Phone Networks, Social Media Platforms, Radio Spots and Printed Visuals). These should be more frequent prior to and during the wet season and at times when LLINs are about to be distributed to communities as part of the mass distribution programme.

(v) Strengthen the functionality and integration of the Malaria Technical Working Group for BCC with an inter-sectoral membership from a range of ministries and technical partners.

(vi) Commemorate World Malaria Day across the whole country with innovative ideas.

(vii) Conduct training / refresher training in collaboration with other joint health programmes to ensure that health personnel (public and private sector), community educators and CHWs are providing updated IEC messages in accordance with the national strategy and the segmented communication approach based on the local transmission setting.

(viii) Review the impact of the malaria communications strategies for Somalia.

(ix) Develop pre-recorded malaria messages targeting different communities and roll out use of portable players for use at community centres and gathering points.

(x) Conduct an annual stakeholder mapping exercise to identify current international and national organisations that provide facility and community based BCC to ensure there is no overlap or conflict in service delivery and to provide adequate coverage in areas in which no BCC is currently being delivered. This can form the basis in which NMCPs can further advocate for national/international funding.

(xi) Pilot the malaria cross-border messaging and communications for travellers, MMPs and other high at-risk populations transcending district, regional and international boundaries.

(xii) Strengthen use of interpersonal communication approach as key tool for malaria messaging in the country with focus on IDPs, MMPs, semi-nomadic pastoralists, mothers and other key and vulnerable segments of the population.

(xiii) Conduct media and other communications channels monitoring services with emphasis on reach, frequency, accuracy and acceptability of messages.

(xiv) Support uptake of IRS, LLINs and Larval source management in targeted communities with adequate campaign before, during and after implementation.

4.6 Pillar 2: Accelerate towards malaria elimination

4.6.1 Objective of the pillar:

"***By 2025, at least 45 districts of Somalia shall be reporting zero local transmission of malaria***".

4.6.2 Preamble and Guiding principles

National malaria elimination is defined as country-wide interruption of local mosquito-borne transmission of a specified malaria parasite species (reduction to zero incidence of indigenous cases)[64]. WHO certification of malaria elimination in a country requires proof that local transmission of all human malaria parasites has been interrupted, resulting in zero incidence of indigenous cases for at least the past three consecutive years. Measures to prevent re-establishment of transmission are required indefinitely until eradication is achieved. While countrywide guidance has been the key reference point, countries have adopted to stepwise process of moving towards sub-national malaria elimination; countries with diverse geography and variable levels of malaria risk will require a highly focused stratification of elimination agenda[65].

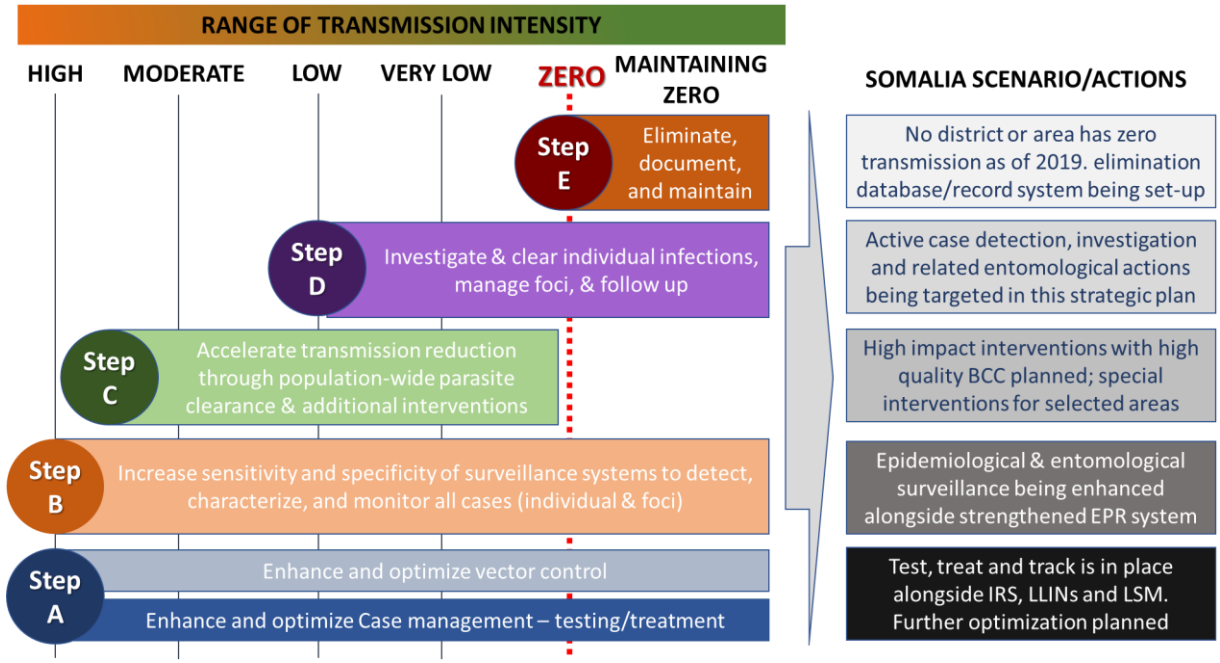


Figure 18: The Somalia situation and adaptability of intervention packages for elimination[66]

While Somalia has demonstrated tremendous progress in containing malaria despite all challenges, the missed opportunities for acceleration towards elimination remains glaring. Eliminating malaria requires collaboration across borders, sectors, and disciplines and this is a critical ingredient beyond technical arrangements. No single intervention or package of interventions will achieve malaria

[64] WHO Global Malaria Programme (GMP), 2017. A framework for malaria elimination, pages 16 - 25. Accessed from https://apps.who.int/iris/bitstream/handle/10665/254761/9789241511988-eng.pdf?sequence=1, on March 1, 2020
[65] WHO Malaria Policy Advisory Committee (MPAC) Meeting material, 11-13 September 2013. Sub-national malaria elimination: Draft for presentation at MPAC meeting, September 2013. Accessed from https://www.who.int/malaria/mpac/mpac_sep13_subnational_elimination_criteria_draft_proposal.pdf?ua=1, Feb. 28, 2020
[66] Adapted from: WHO Global Malaria Programme, 2017. A framework for malaria elimination, pages 16 - 25. Accessed from https://apps.who.int/iris/bitstream/handle/10665/254761/9789241511988-eng.pdf?sequence=1, on March 1, 2020

elimination in all countries; rather, a set of interventions should be identified and used appropriately for the malaria transmission intensity and dynamics to achieve and maintain elimination.

WHO certification of malaria elimination in a country requires proof that local transmission of all human malaria parasites has been interrupted, resulting in zero incidence of indigenous cases for at least the past three consecutive years. Attainment of sub-national elimination will be entry point to attaining total national elimination. Excellent surveillance and response are the keys to achieving and maintaining malaria elimination; information systems must become increasingly "granular" to allow identification, tracking, classification and response for all malaria cases. In formation is a critical aspect of achieving and maintaining malaria elimination; as malaria transmission decreases, surveillance and response systems must become increasingly sensitive and focused to identify, track, and respond to malaria cases and remaining transmission foci.

4.6.3 Component 2.1: Enhanced Epidemiological & entomological surveillance

In order to design appropriate elimination strategies, it is essential to understand where the country and its communities lie on the spectrum of malaria transmission. The burden of disease in each locale, measured as transmission intensity, impacts the feasibility of effective deployment of certain interventions. Pillar 3 of the Global technical strategy for malaria 2016–2030 (GTS) is transformation of malaria surveillance into a core intervention in all malaria-endemic countries and in those countries that have eliminated malaria but remain susceptible to re-establishment of transmission[67]. Surveillance is "the continuous and systematic collection, analysis and interpretation of disease-specific data, and the use of that data in the planning, implementation and evaluation of public health practice"[68]. Surveillance is therefore the basis of operational activities in settings of any level of transmission with an objective of supporting reduction of the burden of malaria, eliminating the disease and prevention of its re-establishment. As transmission decreases, malaria becomes focal, and the intensity and frequency of reporting increase. Surveillance systems evolve from reporting aggregate case data by month over large geographical areas (e.g. district) to reporting near-real-time individual case data in small areas (foci).

In areas with API above 5 per 1,000 population, the surveillance system will focus on providing data on trends and aggregate localities that drive transmission. This will provide data for overall analysis of trends, stratification and planning of resource allocation. In areas with API below 5 per 1,000 population, the objectives of surveillance are to identify, investigate and eliminate foci of continuing transmission, prevent and cure infections and confirm elimination. All low and very transmission districts shall be placed on active surveillance in line with requirement for elimination programming. The malaria surveillance system will comprise of the people, procedures, tools and structures necessary to generate information on malaria cases and deaths.

[67] WHO GMP, 2015; Global technical strategy for malaria 2016–2030, Geneva. Available from https://www.who.int/malaria/areas/global_technical_strategy/en/. Accessed February 28, 2020

[68] WHO, 2006; Communicable disease surveillance and response systems: guide to monitoring and evaluating. Accessed on March 26, 2020 from http://www.who.int/csr/resources/publications/surveillance/WHO_CDS_EPR_LYO_2006_2.pdf?ua=1

4.6.3.1 Strategy 1: Epidemiological surveillance

NMCPs including entomologists and technical partner agencies form the Malaria Technical Working Group (MTWG). In conducting epidemiological surveillance, the NMCPs will utilise country data to analyse trends and key areas showing upsurges. Capacity will be built and strengthened for regular data collection and analysis especially at district level to support early detection of upsurges and likely malaria outbreaks. Epidemiological risk thresholds shall be determined annually by catchment areas based on the actual burden of disease. the NMCPs will enhance the use of the daily epidemiological reporting (Good morning report) in areas with low to very transmission to trigger off the need for immediate active case detection and classification. All positive malaria RDT cases in those areas must be subjected to microscopy to provide for parasite speciation and abundance.

4.6.3.2 Strategy 2: Entomological/vector surveillance

Capacity for entomological surveillance and vector control for all endemic and emerging vector borne diseases will be enhanced as well as planning and implementation of IVM at all levels[69]. Strong inter- and intra-sectoral collaboration including community participation is needed for effective implementation of IVM[70]. In alignment with the Global Plan for Insecticide Resistance Management in Malaria Vectors, Routine longitudinal entomological surveillance and Insecticide Resistance Monitoring should underpin the selection of appropriate vector control interventions as part of Integrated Vector Management and the choice of insecticides and LLINs. Entomological surveillance will become central and routine with frequency and duration doubled across all locations. The insectaries shall be further enhanced with more functional laboratories and personnel.

Entomological investigations are an essential aspect of malaria vector control, as these investigations provide information on vector species, their composition and distribution, adult and larval density, human blood index, infection rates, resting, biting and resting behaviour monthly, as well as annual susceptibility/resistance to insecticides used for malaria control. More so, these investigations are useful for the monitoring of emerging and re-emerging vectors and the role they play in disease transmission. As such, information collected through entomological surveillance techniques assists in the understanding of the spatial and temporal fluctuations in vector species, efficacy and effectiveness of vector measures employed for malaria control.

4.6.3.3 Specific Objectives

The specific objectives are:

(i) Ensure that 100% of all malaria cases in low to very low transmission areas are fully investigated and classified within 7 days
(ii) Ensure that all transmission foci are fully investigated and classified within 14 days

[69] Concept of IVM remains challenging in Somalia as a whole. Modifications may happen along the timeframe of this strategic plan as there aren't so many mosquitoes related vector born diseases in the country.
[70] 2019 Malaria Strategic Plan MPR report. Page xx.

4.6.3.4 Core Activities

(i) Update and disseminate the national guidelines for integrated vector surveillance and control of endemic and emerging vector borne diseases for Somalia.
(ii) Strengthen the capacity for entomological surveillance and vector control for all endemic and emerging vector-borne diseases
(iii) Refurbish and staff the insectaries to ensure they can conduct the routine vector surveillance activities through rehabilitation of insectaries/entomology laboratories to support vector surveillance and the use of reared mosquito colonies for more comprehensive insecticide resistance monitoring and detection of insecticide resistance mechanisms in addition to WHO bioassays.
(iv) Conduct vector surveillance activities across the country. Surveillance will be divided into three pillars, 1) Monthly Vector Bionomics (Adult/Larval) providing spatial / temporal feedback where routine vector control operations are ongoing. 2) Annual Insecticide Resistance Monitoring (including identification of insecticide resistance mechanisms) and Intervention Effectiveness (LLIN Longevity and IRS Wall Bioassays) will help guide the Insecticide Resistance Monitoring strategy, and 3) Stand-alone field-based entomological evaluations to pilot the effectiveness and potential for alternative vector control interventions that are locally applicable.
(v) Conduct annual malaria stratification and risk analysis/mapping
(vi) Establish and sustain linkages between central level and community level entomological monitoring mechanisms
(vii) Support integration of entomological database into the national malaria database and the DHIS2 at MoH.

4.6.4 Component 2.2: Build and expand Capacity for malaria elimination

Capacity of NMCPs to implement elimination program remains central to sustaining the gains and building momentum. In South Central Somalia where transmission is high, the focus of the program will be to reduce the burden. In Puntland and Somaliland, there is need to fully capacitate the NMCPs to deliver elimination programming which entails expansion of active case detection and investigation, conduct full vector surveillance, conduct foci investigation and classification, and work towards prevention of reintroduction of local transmission in areas considered malaria free. The additional and heightened role of NMCPs in the elimination setting will therefore include:

- Coordinate the malaria elimination and sub-national classification and eventual certification through a national malaria elimination committee/task force.
- Identify and target areas and population groups most severely affected by malaria, to deliver the necessary interventions effectively and to advocate for more resources.
- Regularly assess the impact of intervention measures and progress in reducing the disease burden and decide whether adjustments or combinations of interventions are required.
- Monitor whether the re-establishment of transmission has occurred and, if so, guide the comprehensive response.

Reference of zero malaria would mean no locally transmitted cases of malaria infection in a defined geographical area although imported malaria may be identified. These categories and measures coincide with the previously used entomologic inoculation rate (EIR). All low transmission districts should attain status of zero local transmission by 2025 if the ambitious goal is to be achieved.

4.6.4.1 Strategy 1: Expand capacity for malaria elimination

The country will ensure the provision of; adequate android devices and airtime to facilitate timely notification, classification and investigation of cases; functional motorcycles, and training of healthcare workers on implementation of key malaria elimination activities. A minimum of 20 districts will be targeted for elimination. A capacity assessment that evaluates the financial, operational, and technical capacity to handle malaria elimination activities will be conducted in xx potential elimination districts.

The districts that meet the minimum criteria during the capacity assessment will start the implementation of activities through training of healthcare workers and provision of; adequate android devices and airtime to facilitate timely notification, classification, and investigation of cases and functional motorcycles. The program will harness already existing resources, and where gaps are identified, deliberate efforts will be made to acquire such resources. There will be a purposeful capacity development process for all the districts that would have failed to meet the minimum requirement from the capacity assessment.

4.6.4.2 Strategy 2: Establish a functional malaria elimination committee

While WHO only certifies national malaria elimination, the country remains with the responsibility to identify candidate localities, track their progress towards elimination and certify local elimination. This committee with be part of the established internal systems to verify malaria-free areas within the country and acts as a coordinating mechanism. The malaria elimination committee will in addition serve key functions of strategy, quality assurance and resources mobilisation to enhance existing efforts at country level.

4.6.4.3 Strategy 3: Establish the malaria elimination documentation system/ database

Collecting and maintaining traceable records on progress towards malaria elimination is central to every certification process by both national committees and WHO in period to come. The need for a sub-malaria database and documentation system for elimination will forever become critical as parts of the country moves to zero local transmission. The existing malaria database will be enhanced with additional sub-module to cater for elimination records and programming at all levels. Capacity will be built to enhance use of android enabled platforms to collect routine data at lowest level of the health system including further digitalising the good morning reports.

4.6.4.4 Strategy 4: Exploring innovative mechanisms to accelerate towards malaria elimination

The country will ensure the establishment of dedicated malaria surveillance, investigation, and response teams from the pool of available staff to offer additional support to the provinces with regards to the implementation of crucial malaria elimination activities these teams are to complement the efforts by the health facility staff, district and provinces in complying with the malaria elimination surveillance algorithm and achieving program targets and deliverables. Innovative measures that the country will consider accelerating towards malaria elimination include mass drug administration, use of drones for entomology surveillance, and microstratification of malaria burden in districts complemented with enhancing targeted vector control to reduce malaria cases in malaria hot spots rapidly.

The significant benefit of using drones is their ability to fly over difficult terrains and improve the speed of aerial surveillance. Learning visits will be conducted to other countries who have reported success with the innovations. In addition to the above, the country will adopt and adapt any other novel evidence-based approaches to malaria elimination when they become available.

4.6.4.5 Strategy 5: Implement malaria elimination activities

All confirmed malaria cases will be notified and trigger a detailed case investigation. Every identified case should be reported within 24 hours; this should be followed by case investigation at the patient's household and neighbourhood within three days from detection. All cases should be geolocated to facilitate spatiotemporal analysis and foci mapping. Case based surveillance data will be entered and shared via an electronic system. Foci identification, mapping and classification will be done according to WHO classification. Routine and robust analysis of case investigation and entomological data will be conducted at all levels to identify all foci. The malaria foci identified will be targeted with appropriate interventions.

4.6.4.6 Specific Objectives

The specific objective is:

By 2025, at least 15 districts shall be reporting zero local malaria transmission

4.6.4.7 Core Activities

(i) Conduct capacity assessment of districts reporting zero local transmission to identify gaps and institutional development.
(ii) Train districts and partners to support re-orientation towards elimination programming.
(iii) Procure, distribute and maintain motorcycles for malaria elimination activities in districts primed for full elimination programming.
(iv) Conduct malaria case investigation and foci investigation and classification activities.
(v) Conduct bi-annual malaria microstratification in at least all districts in Somaliland and Puntland as part of targeting for elimination.

(vi) Pilot Mass Drug Administration in selected districts with extremely high transmission in areas with low to very low transmission.
(vii) Constitute and support the bi-annual meeting of the national malaria elimination committee.

4.6.5 Component 2.3: Target high transmission districts elimination areas

Based on principles of microstratification and targeted approach, it was evident that among the top 10 high burden districts, Bossaso was among them yet it is geographically not located in areas of high malaria transmission. Applying the principles of high burden to high impact as rolled out by the WHO and partners[71], it comes out clearly that across many regions and districts, only a small proportion of the areas is responsible for nearly 70-90% of transmission. In the period of this strategic plan, a special focus will be made to conduct a highly targeted response to areas and districts responsible for heavy burden and high transmission. In the prioritisation, the districts of Bossaso, Borama, Rural Hargeisa, among others in addition to the other nine districts in the top ten high burden districts shall be given a different cocktail of interventions to ensure that they have their cases significantly drop by 95% by 2025. By March 2020, the districts considered high burden and driving the country's burden are shown in table 5.

Addressing transmission drivers and the specific challenges across these districts will evidently have benefit to all the other districts. In 2017, an action plan for Bossaso was developed to address the drivers of transmission and it led to a rapid decrease in the cases one year on. A steep decline in the burden was observed with use of simple strategies including community level LSM and mobilisation. Similar approach should be applied for each of the high burden districts identified in table 5 to bring down burden while attaining impact.

Table 5: Top 10 malaria high burden districts in Somalia[72]

Districts	API per 1000 Pop.			
	2016	2017	2018	average 2014-2018
Wajid	5.26	1.18	7.17	2.80
Bardhere	0.91	3.57	3.54	2.97
Adado	6.51	2.25	4.16	3.27
Afgoye	2.09	3.19	7.47	3.35
Luuq	1.64	4.56	3.11	3.70
Jilib	11.18	6.80	0.97	5.75
Kismayo	6.89	7.69	12.65	6.83
Baidoa	11.91	7.90	16.75	8.06
Dolow	19.03	25.34	57.01	24.50
Bossaso	59.70	91.07	24.44	45.81

4.6.5.1 Strategy 1: Develop and implement district specific action plans

Each of the 10 high burden districts will be assessed on extent of their vulnerabilities, risk factors and key opportunities to build on to address the facilitators of malaria transmission. This assessment will be like the one done before for Bossaso[73] but with stronger focus on the main foundation for malaria transmission. This assessment will look at ecology, human factors, non-health factors, key

[71] WHO, RBM Partnership to End Malaria, 2019. High burden to high impact: a targeted malaria response. Accessed from https://www.who.int/malaria/publications/atoz/high-impact-response/en/; on March 4, 2020
[72] Statistics based on HMIS data extracted from malaria database
[73] WHO Report on Bossaso

entomological issues, uptake of interventions, among others. The outcomes of this will lead into the joint development of district-specific two years malaria action plans that their implementation will be led by the local authorities with technical support from the NMCP. A further action plan will be developed after the MTR of this strategic plan to extend the concerted high impact actions.

4.6.5.2 Strategy 2: Increase coordination and collaboration beyond malaria

Given the fact that the drivers of these transmission particularly the ones related to environmental factors and human activities that lead to increased anopheline oviposition, there is need to engage all key sectors in the target districts to be part of the wider response. In some districts, the drivers of mosquito multiplication are temporary water sources and hence the need to engage the urban and rural water authorities to provide clean water sources. Similar arrangements will be made to consider the drivers associated with increased mobility, temporary immigration particularly the seasonal visitors who migrate due to weather, IDPs, among others. A district specific multisectoral strategy for engagement will be made depending on the type and complexity of the district. this is with an aim of expanding use of locally available resources to strengthen the district response. The empowered political structures will ensure political support for malaria and leaving no one behind.

4.6.5.3 Strategy 2: Enhanced community participation in malaria control

Gaining and utilising a detailed knowledge of community perceptions of malarial symptomatology and treatment-seeking behaviours is essential in guiding effective community participation strategies for malaria control and elimination[74]. An effective malaria elimination programme requires interactions between the community and its leaders, malaria workers and health providers for success in diagnosis and prompt treatment. In these districts, there will be the principle of having enabled communities and active participation of communities in prevention of malaria through use of the clan structures, putting in place village score cards and putting in place a more responsive delivery systems that overcome barriers faced by communities.

4.6.5.4 Specific objective:

By 2025, reduce the burden of malaria in the 12 target districts by 95% based on 2019 baseline value.

4.6.5.5 Key activities:

(i) Conduct assessment of all the twelve targeted districts to identify the drivers of transmission, barriers to services access and key ecological, population related and other factors.
(ii) Develop joint action plans for each district together with the district leadership and put in place a comprehensive multisectoral implementation mechanism.

[74] Tynan, A., Atkinson, J., Toaliu, H. *et al.* Community participation for malaria elimination in tafea province, vanuatu: part ii. social and cultural aspects of treatment-seeking behaviour. *Malar J* **10,** 204 (2011). https://doi.org/10.1186/1475-2875-10-204

(iii) Develop and roll-out community level scorecards for use by the clan and other community leaders to strengthen social accountability and participation of the communities.
(iv) Provide high impact interventions in line with pillar one of this strategic plan.

4.7 Pillar 3: Strengthened Strategic Information generation and use

4.7.1 Objective of the pillar:

"***By 2025, malaria M&E, EPR and surveillance capacity is enhanced to provide the required national strategic information for decision making***".

4.7.2 Preamble and Guiding principles

Strategic information management focusses on the use of data generated from program implementation, research and other external sources for the benefit of continuous alignment to the long-term goals for the malaria programs building on experience and previous plans[75]. This pillar therefore looks at the deliberate focus to generate and use data to drive the quality, intensity, scope and scale of the national malaria response. Use of strategic information approach with support rationality in the decisions including but not limited to: allocation of various resources, including skills, knowledge, experience and expertise; targeting of the overall national response; empowerment of all actors in malaria space; and providing the required accountability[76]. Strengthening national surveillance systems and monitoring evaluation capacity will enhance the availability of strategic information which is vital to ensure the national malaria control is being implemented effectively, and that it can respond more effectively to changing contexts and to transition districts to the elimination pathway.

An accompanying robust National Malaria Monitoring and Evaluation Plan 2021-2025 provides a framework in which the country can objectively measure progress with respect to the outcome of implementing strategy linked interventions, and measure the impact associated with their delivery. It is expected that under this NMSP, the monitoring and evaluation of the programme will be enhanced, and surveillance systems will be strengthened further, especially with their extension to the PHU and community level. This will ensure the country is adequately equipped to assess longitudinal trends with more certainty, and transition more effectively towards elimination, in areas of historically low transmission, whilst maintaining that status in areas with no local transmission.

4.7.3 Component 3.1: Enhance malaria data collection, storage, analysis and use

Significant strides have been achieved in standardising and digitalising the malaria information under the malaria database. The data is now transmitted through the national DHIS2 aggregator system but

[75] Andrada, A., Herrera, S. & Yé, Y. Are new national malaria strategic plans informed by the previous ones? A comprehensive assessment of sub-Saharan African countries from 2001 to present. *Malar J* **18,** 253 (2019). https://doi.org/10.1186/s12936-019-2898-4
[76] USAID/CDC, 2015. President's Malaria Initiative Strategy 2015–2020, pages 8, 11 and 15. Accessed from https://www.pmi.gov/docs/default-source/default-document-library/pmi-reports/pmi_strategy_2015-2020.pdf?sfvrsn=24, on March 16, 2020

big challenges in having the interoperability and linkage with the malaria database that is used to clean and review the quality. Quality of data on uncomplicated malaria has significantly improved but data on severe malaria, IPTp, LLINs and IRS coverages remain relatively weak and not fully integrated into the mainstream database. Likewise, despite rolling out a semi-active surveillance system, the data from surveillance remains largely isolated and not integrated. To some degree, this data requires standardisation and improvement in overall quality, tools, collection and transmission mechanisms, and utilisation for decision making. Efforts have been made to fully integrate malaria data as a module into the DHIS2 system, but this requires further institutional strengthening and arrangements. This component will therefore apply the following strategies.

4.7.3.1 Strategy 1: Strengthen integration of malaria database into the DHIS2

The WHO EMRO, UNICEF Somalia and the Global Fund have made tremendous effort to ensure that the existing malaria database is enhanced to provide all required data for generation of strategic information to drive impact. Both human capacity and information technology support has been put in place and by 2019, the system was able to provide critical epidemiological data to support national programming including strategic planning. This malaria database has to some degree integrated the relevant HMIS/DHIS2 and early warning detection surveillance system, aligned indicators, routine antimalarial efficacy monitoring, insecticide resistance monitoring, and outcome indicators associated with vector control intervention delivery. This system by December 2019 was still facing challenges of seamless interoperability with the DHIS2. In the period of this strategic plan, the preferred sustainable linkage between the DHIS2 and the malaria database will be made complete with updates to the indicators and key operations related components.

4.7.3.2 Strategy 2: Develop, digitalise and link the malaria surveillance data systems

For low transmission areas, the country needs to align surveillance systems for a paradigm shift towards elimination. The national HMIS/DHIS2 is not a malaria specific surveillance tool and remains unable to address the need for active case detection and investigation central to elimination areas. Whilst it provides indicative measures of the disease burden at the public health facility level, the NMCPs need a more dynamic system by which to triangulate many sources of malaria information if they are to adequately address the shifting priorities of the programme. This needs to be backstopped with indicators that support such endeavours within the HMIS and the malaria database, in combination with extended case management at the community level through iCCM. In districts in which incidence consistently (e.g. previous 3 yrs.) remains low (<1 case per 1000 of the population), indicators will need to capture species type and source of infection (e.g. indigenous or imported). The country will enhance the malaria surveillance database building from paper-based systems in the community and enhancing their digitalisation as it progresses up through the system. In line with components under pillar 2, the Somalia malaria elimination and surveillance data system will be enhanced and upgraded to be ready to provide evidences for the malaria elimination committee and future country certification processes.

4.7.3.3 Strategy 3: build capacity for regular data analysis and use of GIS

Capacity to regularly clean, analyse and provide evidence for decision making has remained challenging in the country. Nearly all personnel involved in malaria data management processed require tooling to be able to provide data for decision making. In this strategic plan, efforts shall be made to ensure that the frontline personnel at district level are able to perform much wider role more than entry and transmission of data. The regular data quality audit functions will be systematically transferred to district level to reduce the overdependency on national level personnel. Continued investment will be prioritised in human resources, to ensure there is functioning quality control mechanisms and coordination, in producing timely and quality driven data reporting.

4.7.3.4 Strategy 4: Apply regular stratification to target interventions

Regular microstratification and routine microstratification plays a critical role in monitoring and identifying the changes in the disease pattern across geographical areas. Malaria risk stratification identifies geographical areas based on the potential risk of malaria transmission. Besides, it is a prerequisite for the rational targeted interventions and an essential step for an effective and efficient resource mobilization. All past malaria stratification considered districts as the lowest unit and as such any high burden reported in any district meant the entire district is at risk irrespective of the variation in transmission foci. This has always led to masking of the actual points and locations that continuously contributed to high transmission. Critical consideration of data from 2016 to 2019 indicated that in districts considered to be high burden, transmission may only occur in a handful of villages that could effectively be targeted as opposed to blanket targeting with interventions. Micro stratification looks at the three critical factors that determine malaria transmission: disease burden (API)-confirmed malaria cases per 1000 risk population), receptivity (ecology) in an environment which support the vectors, vector behaviours and bionomics that define relative efficiency of the vector, and the duration of transmission; and lastly vulnerability in terms of population movement. Over the period of this strategic plan, capacity will be built to ensure that dynamic stratification and risk analysis are carried out.

4.7.3.5 Specific objective:

Ensure that reliable data, evidence and up to date information is available for national and sub-national level decision making and resources allocation.

4.7.3.6 Key activities:

(i) Support the integration of malaria database into the DHIS2 system as a disease specific module with all key malaria indicators and data elements fully covered.
(ii) Launch a HMIS/DHIS2 compliant Malaria Database which provides dashboard reports triangulating different malaria specific data outputs at the impact level and tracks programme delivery through coverage outcomes and integrates routine clinical antimalarial efficacy monitoring and Insecticide Resistance / entomological surveillance monitoring.
(iii) Develop and digitalise the malaria surveillance database linked to the good morning reports.

(iv) Conduct training in use of GIS and stratification for all persons involved in managing malaria data at national and district level.
(v) Maintain the malaria surveillance database and related components of reporting
(vi) Support regular microstratification and promotion of use of stratification data for decision making.
(vii) Conduct bi-annual malaria data quality audits and assurance.
(viii) Conduct capacity building for DHIS2 users at all levels.
(ix) Ensure that SOPs for reporting, collating and analysing malaria data for anomalies are updated for health personnel.
(x) Participate in quarterly HMIS review meetings for system development and troubleshooting.

4.7.4 Component 3.2: Enhance capacity for effective EPR systems

There is an inverse relationship between malaria transmission intensity and epidemic risk. Risk potential has now been mapped in Somalia, which broadly demarcates which districts and even settlements are most at risk from outbreaks or true epidemics. While there is some level of risk throughout the country, the highest probability for outbreaks / epidemics to occur is in the northern parts of Somaliland and Puntland. Some villages in SCS are also at high risk, mainly around the Juba and Shabelle rivers (Figure 19). Past impacts of climate change in Somalia has left significant shocks and as well led to spikes in malaria transmission.

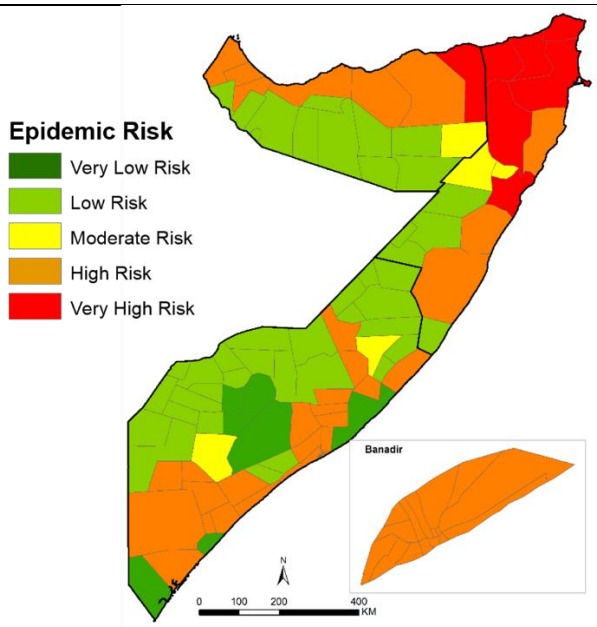


Figure 19: Modelling malaria epidemic risks based on climate data, entomology and epidemiology

Risk potential is dynamic, in that both spatial and temporal fluctuations will occur seasonally and annually; as such, defining greatest risk across the country should be a continual exercise. The 2016/7 drought left an estimated 5.4 million people in need of humanitarian assistance and over a million people were displaced, causing damage and losses valued at over $3.25 billion76. The 2016/7 drought in Somalia took a major toll on affected populations in terms of basic living conditions as well as education, water, sanitation and basic healthcare services[77]. As such, these directly impact on malaria as a disease that quickly gets affected by any slight ecological changes. The resurgence of malaria in Bossaso region is also linked to IDP movement from endemic areas due to drought. SWALIM has over the years continued to provide risks of climate change and any significant impact it may have on the national situation. The effective EPR will therefore have to consider both the risks emanating from climate change through to the other factors associated with migrations, urbanisation, changing behaviours

[77] Somalia Humanitarian Situation Report#10. (2018).

among others. All EPR systems shall be linked and integrated with the overall national system that considers all risks to the population.

4.7.4.1 Strategy 1: Enhance epidemic Detection

A reliable early warning system that triangulates data from numerous sources and from surveillance linked to other strategies, needs to be strengthened and coordinated more effectively under this strategic plan. Vulnerability risk indicators will require an inter-organisational approach in which malnutrition, migration and infrastructure programmes will provide data to the NMCP when anomalies arise. Malaria epidemics may be defined as a situation when the number of malaria cases are in excess of the normal number at a specific period and place. Pre-epidemic threshold curves will be developed by taking malaria case data from several years previous. Continued collaboration with SWALIM is vital as graphical representation of meteorological anomalies (predominantly precipitation levels) will signal the potential for epidemics. The principal data source underpinning the detection of an epidemic are confirmed malaria cases and case fatality rates that comes mainly from the weekly detection system. The epidemic monitoring system should be strengthened through building capacity of peripheral health service units in detecting the likelihood of epidemic situations from their basic day-to-day collection of information.

4.7.4.2 Strategy 2: Epidemic Response

Containment of outbreaks / epidemics will require continuous preparedness. To ensure an adequate response can be mounted, contingency funding that is weighted according to the number of high-risk districts within NMCPs needs to be in place. Funding needs to account for a rapid assessment whenever environmental changes and vector density increase, as well as for holding commodities in which to mass test and treat and to roll-out focused IRS spraying, or the distribution of LLINs, if the target population is sufficiently small. A feedback loop as part of a post-epidemic evaluation is a vital part of the response itself, as it guides communities, health centres, district and regional health offices and NMCPs/MoHs on how to, 1) Further mitigate against future epidemic occurrences, and 2) Strengthen future responses.

4.7.4.3 Specific Objective:

To proactive detect all potential outbreaks and respond within two weeks of onset to 100% of outbreaks/epidemics.

4.7.4.4 Core Activities

(i) Update the malaria Preparedness and Response Strategy to align to the existing national guidelines and strategies.
(ii) Strengthen and maintain a functioning EPR units within the MoHs and ensure trained capacity is in-situ to lead response teams.
(iii) Conduct periodical review of the country malaria epidemic risk analysis to ensure appropriate granularity of sentinel sites deployed for early warning detection.

(iv) Sustain and enhance inter-organisational collaboration to ensure timely access to vulnerability and meteorological indicator outputs.
(v) Work with technical partners and SWALIM to better utilise known mapping locations of Berkads, Hand-dug wells and Ponds as a starting point for Larval Source Management as part of IVM and as a way of potentially using such locations as a way of reaching out to provide vector control options to Semi-Nomadic Pastoralists who may use such water providing spaces.
(vi) Facilitate rapid assessments in response to potential outbreaks and ensure reactive based entomological surveillance and population migration assessments.
(vii) Ensure that focal response teams are adequately and routinely trained in components of the response according to national guidelines and SOPs.
(viii) Strengthen the operation of a reliable Early Detection System (EDS) and ensure that sentinel site granularity is representative for the number of districts with the most risk of epidemics In newly established sentinel sites, ensure morbidity / mortality data can be retrospectively collected to establish a baseline on which to monitor against. Integrate the use of mobile phone SMS network reporting to ensure Realtime reporting and quicker response times for completion of rapid assessments.

4.7.5 Component 3.3: Impact and Outcome Surveys

Evaluation of outcomes and impact is needed to document periodically whether defined strategies and implemented activities lead to expected results. Such are conducted through a wide range of preferably population-based surveys that provides linkages beyond the malaria disease components but to consider behavioural, systemwide approach and disease outcomes. The periodicity of evaluation varies considerably according to the changes expected in the different areas evaluated. The key planned surveys, the timing and overall coverage and purpose is provided in table 6 below. It should be noted that for some surveys, malaria is only a component and others cannot take place at the same time.

Table 6: Planned/anticipated surveys 2021 - 2025

Planned survey	Timeframe	Purpose and focus
Malaria Indicator Survey (MIS)	2022?	Measuring progress on coverage and utilization outcomes after delivery of malaria control interventions (LLINs coverage, malaria knowledge, parasite prevalence, treatment seeking behaviour, etc)
Multiple Indicator Cluster Survey (MICS)	2021?	household survey aimed at collecting and analysing data in order to fill data gaps for monitoring the situation of children and women; and tracking progress towards elimination of disparities and inequities.
Demographic and health Survey (DHS)	??	Nationally representative household surveys that provide data for a wide range of monitoring and impact evaluation indicators in the areas of population, health, and nutrition. Malaria is a component in Somalia

Table 6: Planned/anticipated surveys 2021 - 2025

Planned survey	Timeframe	Purpose and focus
Services Availability and Readiness Assessment (SARA)	Annually	Health facility assessment tool designed to assess and monitor the service availability and readiness of the health sector and to generate evidence to support the planning and managing of a health system.
National Health Facility Assessment	2021, 2024	Benchmark the functionality and performance of health facilities that offer malaria services based on key area and quality of malaria case management service delivery
Epidemiological impact assessment of malaria in Somalia	2024	Impact assessment of combination of malaria interventions on the profile of malaria over period not lest than 20 years
Food Security and Nutrition Analysis Unit (FSNAU)	Annually?	Measure the outcome coverage indicators and determinants of health seeking behaviour and serving as a bridging interval between MIS surveys to look at retention of LLIN coverage/utilisation etc

4.7.6 Component 3.4: Operational Research

A strong local evidence base will be required to adopt new interventions, pilot new mechanisms of programme delivery and look at cost effectiveness of current and new tools in a range of varying transmission settings across the country. Operational research will form a foundation in escalating the transition from enhanced control to elimination. Several operational research agenda have been proposed for the period of the strategic plan to bridge the gap between evaluations and program performances improvement through generation of routine research evidences. The list of operational researches agenda will continue to evolve and the malaria TWG will always continue to review and prioritise based on need and actual country situation. All Operational Research evaluations have NMCP / MoH involvement or co-investigation to ensure the national capacity to undertake future evaluations is enhanced. Table 7 below provides a summary of the key Operational research agenda prioritised for the strategic plan.

Table 7: Planned/anticipated operational researches 2021 - 2025

Planned area	Timeframe	Purpose and focus
Conduct Therapeutic Efficacy Survey (TES) for malaria medicines	Annually	Effective case management and detection of resistance and routine assurance of efficacy of commonly used antimalaria medicines
LLINs durability assessment	2022 - 2024	Assess the useful life of LNs distributed in the country keeping to three determinants of chemical content, material integrity and biological efficacy
LLINs insecticides cone bioassay and wash effect assessment	2022	This is to assess the efficacy of the distributed LLINs in terms of chemical components, materials integrity and overall wash-resistance index.
Use versus ownership of LLIN	2021	Interrogate in more detail household disparities in ownership versus use

Table 7: Planned/anticipated operational researches 2021 - 2025

Planned area	Timeframe	Purpose and focus
Malaria parasite prevalence	2021, 2024	Given the overall low prevalence of malaria infection in Somalia, MIS sampling is underpowered to provide reliable estimates of infection per region. This is to more reliably track changes in infection prevalence
Nomadic Pastoralists and malaria	2021	Address information gap for malaria, and other diseases, through specialised sampling and adapted research tools to identify not only infection but serological exposures, travel histories and build a more informed basis for malaria prevention /management in this group
IDPs and malaria transmission risks	2021	Understanding the transient and continuous risks of IDPs for malaria in line with existing inter-agency guidelines and overall national response mechanisms.
Evaluating Test Treat & Track (TTT) Policy	Annually	Understand the current adherence to standard treatment guidelines, or Quality of Care (QoC) and the Quality of Data (QoD) in the formal health care sector for malaria
Malaria matchbox assessment	2022, 20224	Understand the broader and granular risk drivers of malaria transmission, at risk population and key health and social systems directions.
Integrated Vector Management (IVM) for Somalia	2022	better harnessing of available data on land use and breeding site location and household surveys on how IVM might be deployed at a national or sub-national level. Notable in this is how to better understand opportunities for urban malaria control.

4.8 Pillar 4: Enhance the enabling environment

4.8.1 Objective of the pillar:

"***By 2025, the enabling environment and systems for malaria response in Somalia are optimally functioning***".

4.8.2 Preamble and Guiding principles

No successful malaria program is delivered in vacuum but in a set of interwoven implementing environment that requires effective analysis, intermarrying and linking the multiple strategies and key interceptions to existing reality scenarios. Knowing the reality scenarios is critical in ensuring that the correct and appropriate enabling environment is there for the program to utilise to deliver the set goals and objectives of the strategic plan. Coordination and partnership under the previous NMSP improved, with further reform coming from the development of HSSPs for broader health system strengthening that benefits malaria control. There is a dedicated network of organisations that work with the NMCPs to assist in programme delivery and provide technical guidance. Funding sustainability remains a continued threat to reversing programme successes, especially now, given the programme will need to invest more heavily in surveillance systems to successfully follow the

path towards elimination. Implementation is predominantly funded by one external donor currently placing significant risk to sustainability. Despite organizational structures being developed for the NMCPs under respective MoHs, positions remain vacant owing to funding limitations and current posts are funded from external resources. The recruitment of personnel at the national, regional, district and extension to communities, is critical for the overall success of the programme, even more so for a country embarking on the path towards elimination. Human resource capacity is also linked with the effective supply of commodities that yield programme impact, as is the supply chain management system itself, which requires strengthening to ensure nobody is left untreated.

4.8.3 Component 1: Enhance multi-sectoral partnership, coordination & collaborations

The NMCPs are mandated to coordinate all malaria control and malaria elimination efforts and ensure that there is standardisation within respective programmes to present a unified and cohesive national strategy. Effective stewardship and leadership of the malaria program is crucial for ensuring that country success is fast-tracked but owned by all stakeholders at all level. This component addresses issues of technical and non-technical coordination of malaria response.

4.8.3.1 Strategy 1: Strengthen stewardship and leadership of malaria response

The NMCPs will take leading role in ensuring that the malaria interventions are delivered well and to desired standards. the existing TWGs shall be strengthened with their TORs including membership reviews. The mapping of partners will be done every two years to ensure partners continue to be accountable and do not overlap in their services provision. NMCPs will ensure that they lead respective malaria working group meetings. Any strategy based technical working groups that are not yet functioning will be established and will provide feedback loops into the broader malaria working group meetings. Meeting outcomes should be published to increase programme visibility and transparency and should feature in an NMCP section component on the respective MoH website. Information at this level should be funnelled up into national quarterly and annual review meetings as well as RBM partnership meetings. NMCPs will be responsible for coordinating and leading all research and surveys for malaria and related areas. The NMCPs commit to spearhead a strong partnership through coordination meetings with the private sector, specifically, to address effective malaria treatment, prevention strategies and quality data reporting. To maximise integration of malaria control and elimination into broader health systems, coordination meetings and joint assessments with other ministries and government departments including implementing partners will be conducted.

4.8.3.2 Strategy 2: Strengthen inter-country cross border collaborations

Beyond national coordination, the NMCPs will actively work within the regional context to seek opportunities for cross-border collaboration and to learn of programme successes elsewhere that could be applicable in Somalia. The country will utilise the already existing collaboration platforms namely the WHO EMRO regional network, the RBM partnership to end malaria, the Inter-

governmental Authority for Development (IGAD) and the African Leaders Malaria Alliance (ALMA) under the African Union to champion cross-country and cross border initiatives. Multiple side meetings with targeted neighbouring countries shall be held on the side-lines of the malaria fora organised each year by the partners. Joint planning meeting with adjacent border districts in the neighbouring countries to plan and coordinate malaria interventions.

4.8.3.3 Strategy 3: Strengthen internal cross border collaborations within the country

Collaborations between districts, zones and states in malaria control and elimination have been weak and as such several challenges continue to persist. In this strategic plan, there will be inter-district collaborations through meetings, benchmarking and best practices sharing. Districts in a common zone will do joint planning and synchronisation of responses under coordination of NMCPs. Quarterly meetings consisting of zones shall be organised in rotary manner to improve collaborations. Annual malaria conference will be organised to bring together all the states to share lessons learnt and provide framework for tracking progress and setting joint milestones.

4.8.3.4 Strategy 4: Improvement/strengthen risk management

The NMCP will facilitate and conduct regular meetings to assess, identify and update the risk management plan, maintain and regularly update risk management registers with all program stakeholders to ensure timely risk mitigation measures are put implemented. Audits will be conducted by MOH Auditors, Comptroller Auditor General and funding partner auditors to ensure adherence to set guidelines. The programme will update its risk register /management plan to ensure identified risks noted by audit teams are addressed.

4.8.3.5 Specific objectives:

(i) To strengthen coordination mechanisms at the national and other levels, encompassing relations with the private sector, to drive effective programme delivery
(ii) By 2025, 90% of Regional and District level personnel can effectively plan, implement and evaluate relevant strategies within the malaria programme.

4.8.3.6 Key activities:

(i) Update the stakeholder mapping, inclusive of the private sector, to ensure maximum impact can be achieved with greatest value for money without duplicitous implementation from partners.
(ii) Ensure that all thematic technical working groups are established and meet biannually, and updated information is fed into monthly malaria working group meetings, quarterly and annual review meetings, and linkage to other sectors.
(iii) Develop and strengthen cross-border collaborations within Somalia and with other countries.
(iv) Participate in WHO and RBM and regional collaborative review meetings and utilize such platforms as a route to expand external funding expansion and diversity.
(v) The NMCPs should develop a web-presence through respective MoH sites and play a more active role in social media platforms to increase visibility and transparency.

(vi) Capacity assessments of implementers directly linked to the NMCP be done every three years so as to bring synergy and optimize programming.

4.8.4 Intervention area 4.2: Strengthen program PSCM capacity

A well-functioning procurement and supply chain management (PSCM) is essential for the uninterrupted supply of malaria commodities. An overall national supply chain strategy for Somalia has been rolled out and it aims at putting incremental improvement efforts to national PSCM system strengthening towards attainment of improvement efforts. Critical issues to be addressed for malaria specific PSCM are mainly on visibility of entire supply chain, quantification and forecasting, ensuring ambient storage for all products, waste management and inventory management systems. In line with the national malaria goal to reduce malaria burden and move towards elimination, NMCP will review the existing supply chain management of malaria commodities such as LLINS, IRS insecticides, PPEC, and medicines and diagnostic equipment. The review will check if we have there are optimal standards and capacities to timely procurement procure and deliveries of the required commodities. The National Supply Management Teams will be expanded to support logistics with locally positioned supply officers that communicate with a national supply coordinator. A good supply chain and management system ensures an efficient and uninterrupted supply of resources and commodities which is critical for provision of quality health services at the point where the services are required. The NMCPs will actively contribute to the further development of such systems from the malaria perspective with focus on appropriate legislation, policies and private public partnerships supply, distribution and quality assurance. System troubleshooting will be addressed by quarterly supply chain management working group (SCMWG) meetings.

4.8.4.1 Specific objective:

To ensure that logistical supply chain systems are functioning effectively, to provide approved quality malaria commodities to all public and selected private health facilities, in a timely manner to avoid any stock-outs.

4.8.4.2 Key activities:

(i) Conduct annual malaria commodities end-user verification to provide guidance on best approaches to enhance malaria commodities security and access.
(ii) Strengthen the participation of the NMCPs in quarterly Supply Chain Management Working Group (SCMWG) meetings with emphasis on strengthening role of program managers in malaria commodities/products supply chain decisions.
(iii) Coordinate with the SCMWG to conduct annual malaria commodities (vector control, case management and program support) quantifications and supply planning, with quarterly supply chain bottleneck analysis.
(iv) Institutionalise regular drug quality testing and expand sampling to regions beyond the capital cities. Ensure availability of reagents for minilabs and introduce a quality assurance testing system for RDTs.

(v) Roll-out the guidelines on quality assurance of malaria commodities in collaboration with the Essential Medicines Program (EMP) on pharmacovigilance and include modules on commodity management and pharmacovigilance in the case management trainings for health workers.

4.8.5 Intervention area 4.3: Ensure adequate human & financial resources to attain the MSP targets

Human and financial resources play central role in ensuring that services are delivered. The country has continued to face critical gaps in the human resources capacity to deliver the essential malaria services owing to highly integrated nature of malaria within the overall system. This is further complicated by high attrition, and conflict, often resulting in displacement. Any human resources for health (HRH) gap at any level has direct impact on malaria services delivery. Likewise, the EPHS approach is not countrywide and, in some areas, the situations become more complex as essential HRH and other resources are not available. Human resource capacity, both in terms of spatial coverage and in quality based on the training background and relevant experience, is still an obstacle to overcome when recruiting health personnel. The focus of this NMSP will be on recruitment of technical teams at regional level, and functioning community health committees and through partners, workers at health post or village level. In turning attention to these three main areas, the aim is to increase capacity of people who will remain stable enough within communities to ensure delivery of activities are sustained with minimum disruption. In terms of financial resources, the NMCP will work with the MoH to heighten the advocacy for further diversification of the malaria resources envelope at all levels.

4.8.5.1 Specific Objectives

(i) By 2017, all human resource capacity within the NMCPs is developed to ensure effective planning, implementation and evaluation of the malaria programme.
(ii) Increase the proportion of the malaria strategic plan budget that is fully expanded to at least 75% by 2025

4.8.5.2 Core Activities

(i) Review the Human Resource Plan (National, Regional and District) and conduct a needs assessment.
(ii) Extend the network of Community Health Committees.
(iii) Facilitate training of recruited technical staff in WHO/National annual regional courses (e.g. case management, vector control, Malaria QC and QA, Programme Management and Planning etc.).
(iv) Conduct annual malaria advocacy meetings with partners and other key stakeholders
(v) Develop the malaria country business plan to provide granular level costs of implementing malaria response at lowest level possible.

5 NMSP 2021 – 2025 IMPLEMENTATION FRAMEWORK

5.1 Implementation arrangements

Given the diversity of the malaria programming in Somalia within the context of challenging operating environment, the malaria response will be coordinated by NMCPs at Federal, Puntland and Somaliland levels with overall coordination under the Global Fund Steering Committee (GFSC) that acts as the interagency coordinating mechanism. The implementation arrangement will be built around the GFSC and the NMCPs within the context of their health ministries.

5.1.1 Organograms and structures of the NMCPs

The three NMCPs responsible for delivery of the results planned in this National Strategic Plan have similar structures with all having a Program Manager with essential staffing for different components. However, peculiar differences exist across Federal, Somaliland and Puntland in terms of reporting lines and overall number of staff. In line with need for elimination agenda being well considered, all the NMCPs will introduce the position of elimination and surveillance officers to strengthen the core role of making surveillance a key intervention at all levels. Annex 1 provides the organograms for all the NMCPs indicating the reporting lines and human resources need to implement the NMCESP.

5.1.2 Planning and implementation mechanisms

While the NMCPs will continue to provide overall technical direction for the malaria response, the coordinated delivery shall be directed through working groups. The GFSC will coordinate the political and strategic decision on malaria resources allocation anchoring on the architecture of the Global Fund. The four technical malaria sub-committees: Vector Control, Case Management, SBCC and SMEO are governed by their TORs. Their mandates are as s follows:

(i) **Vector control sub-committee** discusses the scale of implementation of key vector control interventions and analyses vector surveillance data and advising the health ministries on recommended action plans.
(ii) **Case Management and diagnostics sub-committee** reviews research recommendations on case management, morbidity and mortality data and comes up with appropriate guidance on case management at all levels.
(iii) **SBCC sub-committee** discusses gaps in SBCC as highlighted by the three subcommittees and comes up with strategies in ensuring maximum access to interventions.
(iv) **SMEO and elimination sub-committee** reviews data from surveillance systems, surveys and routine data and comes up with summaries that are shared with the other subcommittees so that evidence-based decisions are made.

5.1.3 Financial resource management

Funds in the country shall be managed based on existing public sector management guidelines and procedures. Partner funding for activities is guided by in country MOUs and the Malaria strategic plan. Partners funding can be paid out directly from partner accounts using their financial procedures

or the funds are given to the NMCPs and health ministry agencies as per agreed formats and timelines. Subsequent funding will depend on performance and submission of comprehensive financial reports and statements to the funding partners. All funding made available to the MOHCC is subject to both internal and external audit.

5.2 Risk management

Sound management of risk will enable the NMCPs to anticipate and respond to changes in the service delivery environment, as well as make informed decisions under conditions of uncertainty. Every public entity shall adhere to and implement the principles of sound corporate governance, procedures and practices. Routine risk registers shall be maintained by the NMCP and partners to ensure better and proactive prevention of implementation risks. It also takes into consideration the constantly changing operating environment both internally and externally. Annex xx provides a summary of the indicative risk and their proposed mitigation approaches.

5.3 Partnership coordination system

This vision for a Malaria free Somalia can only be achieved in partnership with other stakeholders – the Multi-sectoral partnerships which entails involving all sectors of society – government, business, civil society organisations and communities. These partnerships are particularly important for effective regulation; improved service delivery, quality, reach and effectiveness; coordination and efficiency in resource use; building ownership and a sense of involvement and participation by all. All partners that support the malaria response shall be governed by this one national strategic plan. The key partnership arrangements are:

(i) **UN, NGO's and Bilateral Partners:** The UN country team, international NGOs, local NGOs and bilateral partners continue to offer support for malaria prevention, control and elimination in line with this strategic plan. Support is either technical or financial or both in all thematic areas.

(ii) **Government ministries, departments and Agencies**: these shall be coordinated through the health ministries and others will be through the different working groups.

(iii) **Private Providers of Health Care:** Engagement still needs to be strengthened in the elimination districts to ensure notification and investigation of all malaria cases. Specific activities shall be made to continuously engage the private sector.

5.4 Budget and resourcing of the MSP

5.4.1 Budget summary

- the budget summary will be presented by both intervention and cost category

5.4.2 Resource mobilization plan

This should include a budget gap analysis and plan for filling funding gaps

6 Monitoring and Evaluation (M&E) Framework

M&E is a set of interactive and mutually supportive processes that are critical for effective program planning and implementation. A clear M&E framework is essential to guide the 2021-025 Somalia Malaria Strategic Plan. This framework will be employed to continuously gather information to:

(i) Track progress for the program implementation of the various components of malaria prevention and control interventions and
(ii) Track progress in meeting strategic targets and milestones.

It is anticipated that this M&E framework will be fully utilised to determine whether progress is made towards the pre-specified objectives.

6.1 Tracking progress

Tracking of progress shall be continuously undertaken to assess the performance of the program across all the interventions. Data will be collected from routine and non-routine sources such as the Health Management Information System (HMIS), sentinel surveillance, progress reports and rapid assessments to monitor program implementation and to inform program improvement efforts. Information will be routinely disseminated to partners in malaria control, stakeholders, government ministries/departments and civil society to demonstrate accountability and transparency. The programme will conduct quarterly performance monitoring meetings and review meetings at national level to review progress of implementation against targets in the annual malaria operational plans. Quarterly coordination meetings and technical working group subcommittee meetings will also be held with key stakeholders and implementing partners to review implementation and address bottlenecks.

6.2 Measuring outcome and impact

A robust monitoring and evaluation system will benefit the NMCP by ensuring that program implementation is data-driven and result-oriented. The M&E performance framework will consider not only the interventions outlined in the 2021-2015 Malaria Strategic Plan (MSP) but will also take into consideration other national, regional and international future strategic directions related to malaria in Somalia. Collaborative approaches involving various partners and stakeholders will be used to track implementation progress. Malaria programme reviews and assessments are essential management tools which will be employed by the health ministries through the NMCP to review the available evidence, assess the malaria situation and evaluate the effectiveness of the systems and processes used to deliver malaria interventions, encourage success, and propose solutions for the identified bottlenecks and barriers. During the period 2021-2025, the following monitoring approaches will be used to guide the effective achievement of the goals and targets set by MSP:

(i) National Malaria Annual Reviews: An annual review will be conducted to assess progress made in the previous years and plan for the upcoming season. These review and planning meetings will bring together all partners and stakeholders in malaria control in the country.

(ii) **Mid-Term review (MTR) in 2023:** This review shall be done in 2023 to assess the progress of the national malaria control program towards the epidemiological and entomological targets of the MSP and review the level of financing of the national malaria control program.

(iii) **Malaria Programme Review (MPR):** The MPR will be conducted at the end of the strategic plan to evaluate the performance of the MSP against its set targets. Apart from reviewing the malaria situation in the country and identifying lessons learned during the 2021-2025 implementation period will be used to inform the 2026-2030 documents.

6.3 Data Management system

National Malaria Control Programme data is in the process of being fully integrated into the National HMIS which is using DHIS2 as data storehouse. Efforts will be made to expand the integration of other intervention reporting systems into the DHIS2/Tracker platform.

Data collection will observe high ethical standards by ensuring compliance with the patient's charter and other related polices on research ethics and good clinical practices. Emphasis will be made to make that all persons have a fundamental right to privacy, collection and usage of their personal information. This is in line with international best practices. Non-routine data including survey data will be managed and stored on databases developed by the NMCP.

Efforts to improve data quality will be strengthened through onsite data verification, data validation meetings, implementation of a supportive supervision system involving operational structures (national-province-district, and health facility to community level) to support the improvement of performance, solving systematic problems and improve the quality of health care and health delivery at all the levels. A national repository will be kept up- to- date and information gathered from various sources will be compiled, analysed and feedback provided through periodic reports, bulletins, and newsletters and presentations to summarize the information obtained. The documented information will also be made available to partners, donors and the communities through various opportunities and channels including conferences/workshops, websites, among others.

6.4 M&E Coordination mechanism

The NMCP works closely with the other directorates to ensure that programme reporting and performance is in line with the national targets as outlined in the National Performance Framework. The NMCPs will also work closely with the Quality Improvement units to ensure that quality control standards and guidelines are adhered to during implementation.

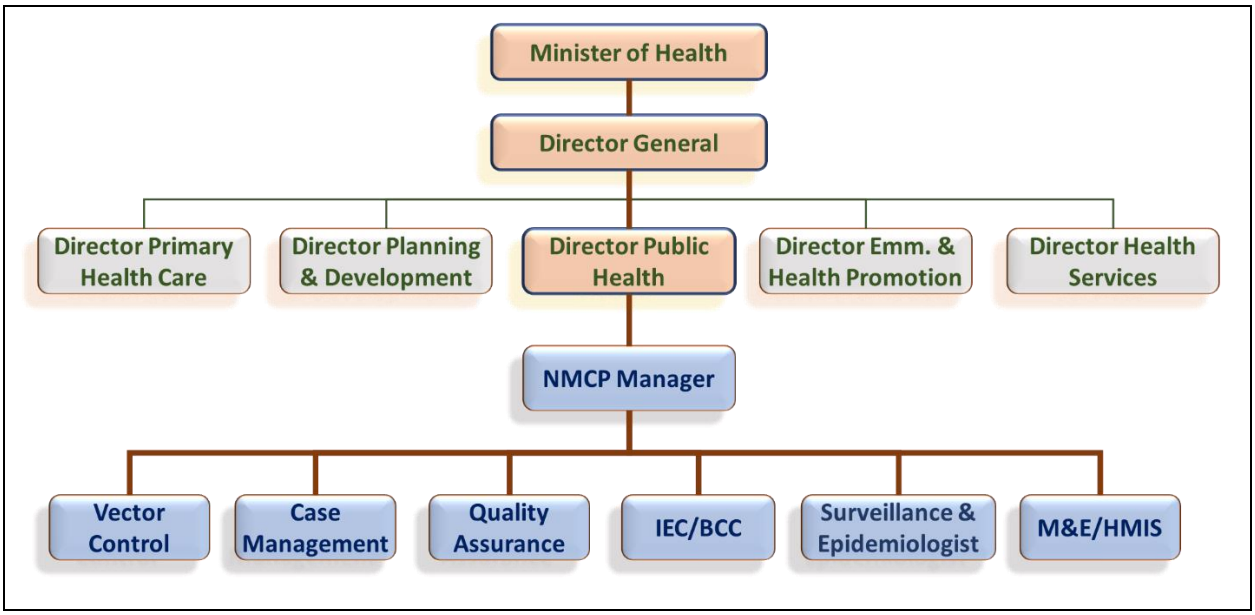
6.5 Strategic Plan Performance Framework

An overarching Strategic Plan Performance Framework has been developed for the MSP. The purpose of this framework is to outline the indicators to be tracked, baselines and data sources. This performance framework is available in Annex 2 with further details provided in the M&E plan.

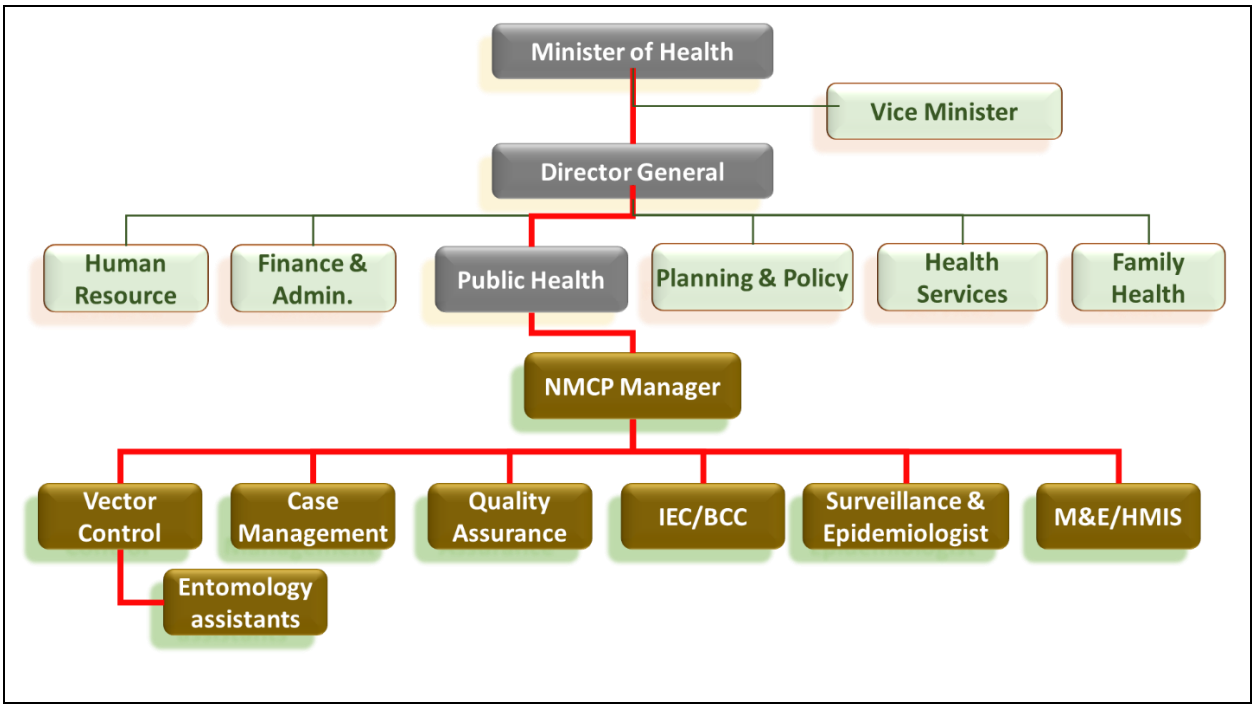
ANNEXES

Annex 1: Organograms of NMCPs

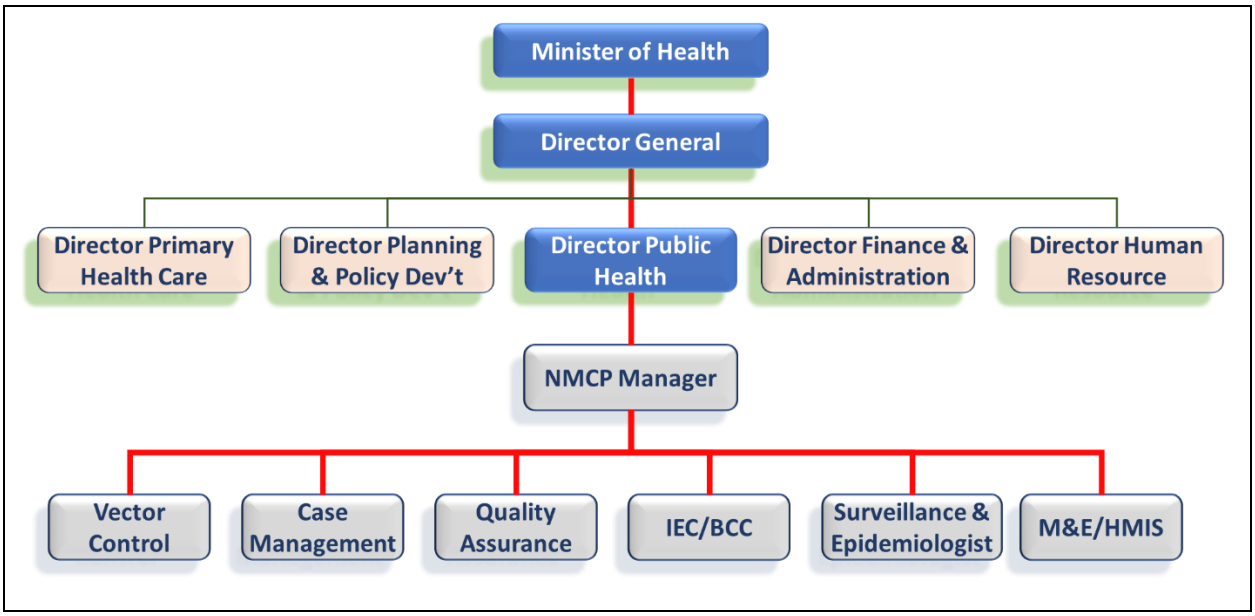
Annex 1.a: MoH and NMCP Organogram for Federal Government of Somali Republic



Annex 1.b: MoH and NMCP Organogram for Somaliland



Annex 1.c: MoH and NMCP Organogram for Puntland



Annex 2: M&E framework 2021 – 2025

Indicator	Baseline		Targets					Responsibility	Sources	Method	Frequency
	Value	Source & Year	2021	2022	2023	2024	2025				
Goal: To attain zero malaria death and reduce malaria incidence to at least 0.5/1000 population by 2025											
Malaria Incidence per 1000 persons per year	2.15	HMIS, 2018	1.72	1.38	1.10	0.88	0.70	NMCPs	HMIS	Routine	Annually
Inpatient Malaria Deaths per 100,000 per year	N/A		<0.01	<0.01	0.00	0.00	0.00	NMCPs	HMIS	Routine	Annually
Confirmed malaria cases (microscopy or RDT): rate per 1000 persons per year (Elimination settings): Annual parasite incidence	N/A		0.20	0.16	0.12	0.08	0.04	NMCPs	HMIS	Routine	Annually
Malaria test positivity rate	12.79%	HMIS, 2018	10.2%	8.19%	6.55%	5.24%	4.19%	NMCPs	HMIS	Routine	Annually
Number of districts reporting zero local transmission for two consecutive years	3	HMIS, 2019	5	7	9	12	15	NMCPs	HMIS	Routine	Annually
Pillar 1: Universal access to appropriate malaria interventions and services (Vector Control, Case Management, SBCC)											
Proportion of targeted households sprayed by IRS within the last 12 months	>100%	IRS report, 2019	85%	85%	85%	85%	85%	NMCP	IRS Reports	Routine	Annually
Proportion of targeted population with access to an ITN within their household	N/A		85%	85%	85%	85%	85%	NMCP	MIS, MICs, surveys	Surveys	Every two years
Proportion of the targeted population that slept under an insecticide-treated net the previous night	N/A		85%	85%	85%	85%	85%	NMCP	MIS, MICs, surveys	Surveys	At least every two years
Proportion of targeted households with at least one insecticide-treated net for every two people	>90%	2019 MPR report	90%	90%	90%	90%	90%	NMCP	MIS, MICs, surveys	Surveys, LLINs reports	Annually

Indicator	Baseline		Targets					Responsibility	Sources	Method	Frequency
	Value	Source & Year	2021	2022	2023	2024	2025				
Proportion of households targeted for IRS confirming that their household was sprayed during the last outbreak onset	N/A		90%	90%	90%	90%	90%	NMCP	MIS, MICs, surveys	Surveys	At least every two years
Proportion of health facilities reporting no stock out of ACTS and RDTs over last one month	N/A		65%	70%	75%	80%	85%	NMCP, UNICEF	LMIS reports	Routine	Monthly
Proportion of suspected malaria cases that receive a parasitological test at a health facility			90%	95%	98%	100%	100%	NMCP, WHO	HMIS	Routine	Monthly
Proportion of suspected malaria cases that receive a parasitological test in the community			100%	100%	100%	100%	100%	NMCP, WHO	HMIS	Routine	Monthly
Proportion of confirmed malaria cases that received first-line antimalarial treatment at health facilities			100%	100%	100%	100%	100%	NMCP, WHO	HMIS	Routine	Monthly
Proportion of confirmed malaria cases that received first-line antimalarial treatment in the community			100%	100%	100%	100%	100%	NMCP, WHO	HMIS	Routine	Monthly
Proportion of malaria cases (presumed and confirmed) that received first line antimalarial treatment at public sector health facilities			100%	100%	100%	100%	100%	NMCP, WHO	HMIS	Routine	Monthly
Proportion of pregnant women attending antenatal clinics who received three or more doses of malaria IPTp								NMCP, WHO	HMIS	Routine	Monthly
Number of insectaries fully established and functioning	0		2	3	3	3	3	NMCP	Program reports	Routine	Annually
Proportion of targeted mosquito breeding sites in urban centres that receive LSM interventions	N/A		95%	95%	95%	95%	95%	NMCP, WHO	Program reports	Routine	Monthly

Indicator	Baseline		Targets					Responsibility	Sources	Method	Frequency
	Value	Source & Year	2021	2022	2023	2024	2025				
Proportion of persons who report seeking appropriate treatment for fever within 24 hours of onset			90%	90%	90%	90%	90%	NMCP, partners	MICS, MIS, other surveys	Surveys	At least every 2 years
Pillar 2: Accelerate towards malaria elimination											
Annual blood examination rate: per 100 population per year (Elimination settings)								NMCP, WHO	HMIS	Routine	Monthly
Percentage of confirmed cases fully investigated and classified (elimination setting only)	0%	HMIS, 2019	50%	75%	90%	100%	100%	NMCP, WHO	HMIS	Routine	Monthly
Number of districts implementing malaria elimination activities (full sub-national elimination)	0	MPR, 2019	5	12	20	33	42	NMCP, WHO	Program reports	Annually	Annually
Percentage of malaria foci fully investigated and classified	0%	HMIS, 2019	50%	75%	90%	100%	100%	NMCP, WHO	HMIS	Routine	Monthly
Proportion of elimination targeted districts able to implement malaria elimination activities			100%	100%	100%	100%	100%	NMCP, WHO	Program reports	Routine	Monthly
Number of national malaria elimination committee meetings conducted as per schedule	0		2	2	2	2	2	NMCP, WHO	Program reports	Annually	Annually
Pillar 3: Enhanced Strategic Information generation and use											
Completeness of facility reporting: Percentage of expected facility monthly reports (for the reporting period) that are received	?		80%	85%	95%	95%	100%	NMCP, WHO	HMIS	Routine	Monthly
Timeliness of facility reporting: Percentage of submitted facility monthly reports that are received on time per the national guidelines	?		65%	70%	70%	75%	85%	NMCPs, WHO	HMIS	Routine	Monthly

Indicator	Baseline		Targets					Responsibility	Sources	Method	Frequency
	Value	Source & Year	2021	2022	2023	2024	2025				
Percentage of facilities which record and submit data using the electronic information system (both)	?		?	?	?	100%	100%	NMCPs, WHO	HMIS	Routine	Monthly
Percentage of facilities which record and submit data using the DHIS2	?							NMCPs, WHO	HMIS	Routine	Monthly
Number of persons with capacity to carry out malaria microstratification using GIS and other analysis	?							NMCP, WHO	HMIS	Routine	Monthly
Number of data quality audits conducted, and reports published	N/A		6	6	6	6	6	NMCPs	Program Reports	Routine	Twice a year
Proportion of malaria outbreaks for which a response was made within 14 days from detection			100%	100%	100%	100%	100%	NMCP, WHO	Surveillance database	Routine	Monthly
Proportion of planned operational research agenda items that are completed and disseminated	N/A		50%	60%	75%	85%	100%	NMCP, WHO	Program Reports	Quarterly	Annually
Pillar 4: Enhanced program enabling environment											
Proportion of health facilities reporting no stock out of ACTS and RDTs over last one month			90%	90%	100%	100%	100%	NMCP, UNICEF	HMIS	Routine	Monthly
Proportion of the MSP budget that is funded	35.3%	MPR, 2019	50%	60%	65%	80%	80%	NMCP, UNICEF	Health Accounts	Annually	Annually
Percentage utilisation of MSP funds (grant budget execution)	??	??	75%	85%	90%	95%	95%	NMCP, UNICEF	Health Accounts	Quarterly	Quarterly
Proportion of approved malaria program positions that are filled			100%	100%	100%	100%	100%	NMCPs	Program Reports	Annually	Annually
Number malaria cross-border meetings conducted with neighbouring countries	0		4	8	8	8	12	NMCP, UNICEF	Program Reports	Annually	Annually
Number of malaria interstate review meetings conducted in a year	N/A		4	4	4	4	4	NMCP, UNICEF	Program Reports	Annually	Annually

Indicator	Baseline		Targets					Responsibility	Sources	Method	Frequency
	Value	Source & Year	2021	2022	2023	2024	2025				
Proportion planned activities that is fully implemented	49.2%	MPR, 2019	55%	65%	75%	80%	80%	NMCP, UNICEF	Program Reports	Annually	Annually

Annex 3: Implementation Framework 2021-2025

Annex 4: Malaria Stratification 2015 – 2019

Annex 3: Country Malaria Incidence

Table 8: Malaria incidence by region 2014 - 2018

Region	District	2014	2015	2016	2017	2018
BAKOOL	EL-BARDE	0.00	0.00	3.92	1.77	0.20
BAKOOL	HUDUR	0.02	0.00	3.71	1.14	8.88
BAKOOL	TIEGLOW	0.49	0.00	1.33	0.44	0.28
BAKOOL	WAJID	0.41	0.00	5.26	1.18	7.17
BAKOOL	YEED	0.00	0.00	3.15	1.02	0.20
BANADIR	MOGADISHU	1.17	1.92	2.42	1.33	0.90
BARI	ALULA	0.00	0.47	1.19	1.43	2.35
BARI	BOSSASO	16.28	37.58	59.70	91.07	24.44
BARI	ISKUSHUBAN	0.31	0.73	3.12	2.20	0.48
BARI	QANDALA	0.03	0.00	2.20	1.87	0.39
BAY	BAIDOA	0.97	2.78	11.91	7.90	16.75
BAY	BUR-HAKABA	0.11	0.10	0.00	0.00	2.61
BAY	DINSOR	0.00	0.00	0.00	0.00	2.93
BAY	KHANSADHERE	2.57	0.18	0.07	0.22	0.27
GALGADUD	ABUDWAK	0.12	0.34	2.62	0.90	0.00
GALGADUD	ADADO	0.00	3.43	6.51	2.25	4.16
GALGADUD	DHUUSA MAREEB	0.00	1.15	6.95	4.09	0.80
GALGADUD	EL BUR	0.00	0.00	0.00	0.00	0.00
GALGADUD	ELDHERE	0.00	4.22	0.00	0.00	0.01
GEDO	BARDHERE	2.52	4.31	0.91	3.57	3.54
GEDO	BELED-HAWA	0.00	2.29	1.11	1.33	2.15
GEDO	DOLOW	0.55	20.58	19.03	25.34	57.01
GEDO	EL-WAK	0.00	3.89	1.31	4.10	0.22
GEDO	GARBAHAREY	0.04	2.50	2.17	1.44	4.72
GEDO	LUUQ	0.23	8.96	1.64	4.56	3.11
HIIRAAN	BELEDWEYNE	0.79	1.81	2.62	1.87	2.84
HIIRAAN	BULOBURTI	0.41	0.36	0.82	0.12	0.35
HIIRAAN	JALALAQSI	0.00	0.00	0.00	0.68	5.86
KARKAR	BENDERBAYLA	0.16	0.16	0.23	1.38	0.21
KARKAR	QARDHO	0.42	0.56	0.66	2.44	0.53
KARKAR	RAKO	0.05	0.12	0.14	0.17	0.18
KARKAR	WAACIYA	0.02	0.09	0.21	0.99	0.07
KARKAR	XAAFUN	0.00	0.03	0.03	0.26	0.04
LOWER JUBBA	AF MADOW	0.00	0.00	1.26	0.80	7.70
LOWER JUBBA	BADADE	0.00	0.00	1.25	4.23	7.22
LOWER JUBBA	JAMAME	2.02	2.93	1.81	0.90	0.99
LOWER JUBBA	KISMAYO	3.76	3.15	6.89	7.69	12.65

Table 8: Malaria incidence by region 2014 - 2018

Region	District	2014	2015	2016	2017	2018
LOWER SHABELLE	AFGOYE	2.82	1.15	2.09	3.19	7.47
LOWER SHABELLE	BARAWE	0.00	0.00	0.57	0.00	0.26
LOWER SHABELLE	KURTUNWAREY	0.00	0.41	1.64	0.51	0.26
LOWER SHABELLE	MARKA	0.06	2.16	4.99	3.41	1.92
LOWER SHABELLE	QORYOLEY	0.22	0.81	1.61	1.40	0.18
LOWER SHABELLE	SABLALE	0.00	0.00	0.00	0.00	0.00
LOWER SHABELLE	WANLAWEYN	0.60	0.02	0.54	0.16	0.14
MIDDLE JUBBA	BUAALE	0.00	0.00	0.00	0.00	0.00
MIDDLE JUBBA	JILIB	7.91	1.89	11.18	6.80	0.97
MIDDLE JUBBA	SAKOW	0.00	0.00	0.00	0.00	0.00
MIDDLE SHABELLE	ADEN-YABAL	0.34	0.95	0.00	0.00	0.00
MIDDLE SHABELLE	BALAD	1.65	4.21	2.17	2.33	1.05
MIDDLE SHABELLE	CADALE	0.30	0.00	0.20	0.00	0.13
MIDDLE SHABELLE	JOWHAR	1.24	1.40	3.25	2.31	0.94
MUDUG	GALKAYO	0.30	0.19	0.88	0.68	2.31
MUDUG	GOLDOGOB	0.00	0.25	0.05	0.00	0.00
MUDUG	HARARDHERE	2.33	1.65	0.00	0.00	1.14
MUDUG	HOBYO	1.07	3.80	6.67	0.97	0.00
MUDUG	JARIBAN	0.00	0.00	0.00	0.07	0.21
NUGAL	BURTINLE	0.02	0.11	0.05	0.02	0.16
NUGAL	EYL	0.07	0.06	0.08	0.02	0.23
NUGAL	GAROWE	0.63	0.28	0.20	0.37	0.16
SANAG	BADHAN	0.19	0.06	0.49	5.38	0.45
SANAG	EL-AFWEYN	0.00	0.00	0.00	0.14	0.00
SANAG	ERIGAVO	0.01	0.09	0.05	0.05	0.03
SOOL	BUHODLE	0.05	0.00	0.00	0.00	0.00
SOOL	AINABO	0.00	0.00	0.00	0.00	0.00
SOOL	HUDUN	0.00	0.00	0.00	1.92	0.00
SOOL	LAASAANOD	0.00	0.01	0.02	0.21	0.01
SOOL	TALEEH	0.00	0.00	0.00	0.32	0.31