



MALARIA ELIMINATION STRATEGIC PLAN FOR SOUTH AFRICA 2019-2023



health

Department:
Health
REPUBLIC OF SOUTH AFRICA





Photo credit: Dr. Jaisree Raman

Foreword

The National Department of Health (NDOH) presents this Malaria Elimination Strategic Plan 2019-2023 for the Republic of South Africa. The strategy comes at an important time as the Southern African Development Community (SADC) heads of state have recently renewed the commitment to eliminate malaria in Botswana, Eswatini, Namibia and South Africa by 2020 and in the whole SADC region by 2030, with the target of zero local malaria cases and deaths. South Africa has made steady progress towards this elimination goal through the implementation of evidence-based malaria policies aligned to the World Health Organization's (WHO) Global Technical Strategy. Malaria elimination has progressed well in parts of the country. In other areas the approach requires some amendment, which will be addressed going forward as part of this new strategic plan.

Eliminating malaria is an ambitious task that requires sustainable resources, collaboration with neighbouring countries (including Botswana, Eswatini, Mozambique, Namibia, and Zimbabwe), evidence-based policies, strong partnerships and dedicated teams.

The NDOH is committed to continuing its efforts to eliminate malaria in South Africa. Malaria elimination promises both health and economic benefits in line with the goals of the 2030 National Development Plan and the UN Sustainable Development Goals. Moreover, eliminating malaria from South Africa will collectively benefit the southern African countries on issues of trade, tourism, health and economic growth.



Dr. ZL Mkhize, MP
Minister of Health
Republic of South Africa


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Eliminating malaria in South Africa requires the development of sound strategies, and effective implementation of those strategies to systematically reduce local malaria transmission to zero. South Africa has transitioned from malaria control towards malaria elimination. South Africa's first five-year elimination strategy has undergone an extensive end-term programme review. This has allowed necessary amendments to move the elimination trajectory forward for the next five years.

This Malaria Elimination Strategic Plan (2019-2023) was developed in consultation with a broad range of stakeholders and partners, from provincial malaria programme managers to international partners including the World Health Organization and technical experts from the South Africa Malaria Elimination Committee.

The completion of this document was coordinated by Dr D Moonasar, Director: Malaria, Vector-Borne and Zoonotic Diseases, with technical guidance from Prof L Blumberg, Chairperson of the South African Malaria Elimination Committee (SAMEC) and strategic guidance from Dr Y Pillay, Deputy Director General for Communicable and Non-Communicable Diseases, Prevention, Treatment and Rehabilitation. The technical support for the completion of this document was provided by the organisations and experts mentioned below. Provincial Department of Health officials: Dr C Asomugha, Ms C Kesebilwe (Gauteng), and Mr E Mabunda (Limpopo), Mr E Raswiswi, Mr B Qwabe (KwaZulu-Natal), Ms G Malatje, Mr M Zwane, and Dr IS Ukpe (Mpumalanga). National Department of Health officials: Dr M Modisenyane (Africa and Middle East Relations Directorate), Ms N Leburu (Communication Directorate), Ms M Phadziri (Communicable Diseases Cluster), Ms B Nemukula and Mr M Ramathuba (Environmental Health Directorate), Mr S Gumede and Mr L Mudzanani (Health Promotion Directorate), Dr EA Misiani, Dr D Moonasar, Mrs MB Shandukani and Mr W Ramkrishna (Malaria, Vector-Borne and Zoonotic Diseases Directorate). Partners who supported the development of the document include: Mr A Mabuza, Mr A Yuen, Mr B Didier, Mr C Davies, Dr L Gast, Ms S Mlilo, Mr P Mangwiro and Ms R Balawanth (Clinton Health Access Initiative), Ms RE Baloyi and Ms P Fakudze (Elimination Eight Initiative), Mr J Fouche and Ms R Dhanan (Lubombo Spatial Development Initiative 2). South Africa Malaria Elimination Committee (SAMEC) Members: Dr N Morris, Prof R Maharaj and Mr V Lakan (Medical Research Council), Prof B Brooke, Prof L Blumberg, Prof J Frean, Dr N Mayet and Dr J Raman (National Institute for Communicable Diseases). Mr K Gausi, Dr ES Baba; Mr A Chinoromba; Dr E Juma and Ms MA Groepe (World Health Organization). Prof J Frean (National Institute for Communicable Disease) and Ms R Graffy (Clinton Health Access Initiative) assisted with the final editing and proofreading of this document.

I am confident that through the efforts of government and its partners, malaria can be eliminated in South Africa.



Ms MP Matsoso
Director-General: Department of Health
Republic of South Africa

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Abbreviations and Acronyms

ACD	Active Case Detection
ACSM	Advocacy, Communication and Social Mobilisation
ACT	Artemisinin-Based Combination Therapy
AL	Artemether-Lumefantrine
APP	Annual Performance Plan
AU	African Union
BCC	Behavioural Communication Change
CDC	Communicable Diseases Cluster
CHAI	Clinton Health Access Initiative
DHIS2	District Health Information System 2
DHT	District Health Team
EQA	External Quality Assessment
EPR	Epidemic Preparedness and Response
GIS	Geographical Information System
IEC	Information, Education and Communication
IHR	International Health Regulations
IRS	Indoor Residual Spraying
IVM	Integrated Vector Management
KAP	Knowledge, Attitudes and Practices
LSDI2	Lubombo Spatial Development Initiative 2
M&E	Monitoring and Evaluation
MIS	Malaria Information System
MOSASWA	Mozambique, South Africa and Swaziland (Eswatini) Initiative
MPR	Midterm Programme Review
MRC	Medical Research Council
MTSF	Medium-Term Strategic Framework
NDOH	National Department of Health
NGO	Non-Governmental Organisation
NICD	National Institute for Communicable Diseases
NMP	National Malaria Programme
PCR	Polymerase Chain Reaction
PHC	Primary Healthcare
QA	Quality Assurance
QC	Quality Control
RDT	Rapid Diagnostic Test
SADC	Southern Africa Development Community
TLMI	Trans-Limpopo Malaria Initiative
UN	United Nations
WHO	World Health Organization

Executive Summary

South Africa has made significant progress in controlling malaria between the financial years 2000/2001 and 2010/2011, reducing malaria incidence from 11.1 to 2.1 total cases per 1,000 population at risk. In 2010/2011, the incidence rate for local and unclassified cases only (excluding imported) was 0.87 cases per 1,000 population at risk.¹ The country has achieved high coverage against set targets with effective malaria control interventions in the areas of case management, vector control, surveillance, epidemic preparedness and response (EPR) and health promotion.

In spite of recently reported upsurges in malaria cases in some districts, South Africa is steadily progressing towards malaria elimination. Malaria elimination is defined by the World Health Organization (WHO) as “the interruption of indigenous transmission of a specified malaria parasite species in a defined geographic area.”² This Malaria Elimination Strategic Plan has been developed in consultation with all concerned provinces, stakeholders and partners to guide implementation of anti-malaria interventions as the country progresses to malaria elimination. The plan also provides direction to the non-malaria endemic provinces to address the growing problem of imported malaria cases and malaria-related deaths.

The goal of this Malaria Elimination Strategic Plan is to achieve zero malaria transmission in South Africa by 2023. To achieve this goal, the plan identifies key strategic objectives and targets as follows:

1. Provide effective management, leadership and coordination for the optimal implementation of malaria elimination interventions at all levels by 2020.
2. Strengthen and sustain the surveillance system so that 100% of malaria cases are reported into the malaria information system (MIS) within 24 hours by 2020.
3. Ensure that 90% of the population affected by malaria receives information and education communication messaging by 2023.
4. Protect all populations at risk to achieve at least 95% coverage with key vector suppression strategies and interventions for the period 2019-2023.

¹ Local and unclassified cases are used to ensure a liberal estimate to avoid underestimating local transmission. Local incidence rate for the same period was 0.58 local cases per 1,000 population at risk.

² World Health Organization 2017, *A Framework for Malaria Elimination*, Geneva.

5. Ensure universal access to diagnosis and treatment in endemic and non-endemic areas according to national guidelines for the period 2019-2023.

To achieve these objectives, this plan further describes strategies for each objective, including the strengthening of:

- Passive, active and entomological surveillance;
- Monitoring and evaluation (M&E) and malaria information systems at all levels;
- Integration with other government stakeholders and partners for implementing key interventions and cross-border malaria initiatives; and
- Building capacity in skills and numbers for malaria elimination.

The Malaria Directorate within the National Department of Health will ensure that the Provincial Malaria Programmes implement the activities described in the implementation plan matrix and throughout this strategic plan with support from the Directorate, stakeholders and partners. The NDOH will facilitate the necessary policy changes to support implementation. In addition, the NDOH will support financial resource mobilisation and monitor the progress toward malaria elimination nationally, and will ensure coordination of malaria elimination activities with the key partners and stakeholders in the country.





Photo credit: Dr. Jaisree Raman

Chapter 1: Background

1.1. Introduction

South Africa's malaria elimination goal is in keeping with the 2007 decision of the African Union (AU),³ World Health Assembly⁴ and the Southern Africa Development Community (SADC).⁵ The NDOH in South Africa drafted its first National Malaria Elimination Strategy for the period 2012-2018. Performance on the implementation of South Africa's malaria elimination strategy underwent medium- and end-term programme reviews in 2015 and 2018 respectively.

In 2015, a mid-term review⁶ of the 2012-2018 Strategic Plan recommended strengthening implementation of each of the strategies to progress towards malaria elimination. In 2018, a comprehensive malaria end-term review made key recommendations that are highlighted in Chapter 4 of this document. The programme review recommended that objectives be set to align to each of the pillars of the WHO Global Technical Strategy for Malaria (2016-2030).⁷

The National Malaria Elimination Strategy (2019-2023) that is presented in this document is intended to serve as a guide to support implementation of strategies at provincial and district levels. It is also an important reference document for partners and stakeholders to consult when drafting their requisite strategies and operational plans.

1.2. Country Profile

Geography

South Africa has a total surface area of 1,219,090 square kilometres and an estimated population of 56.5 million as of 2017. The country shares borders with Botswana, Eswatini (formerly Swaziland), Lesotho,

3 Africa Malaria Elimination Campaign, 2007

4 WHO 2016 Eliminating Malaria

5 Windhoek Declaration on Eliminating Malaria in the SADC Region, August 2018

6 South Africa Malaria Mid Term Review 2015

7 WHO 2015, Global Technical Strategy for Malaria 2016-2020

Mozambique, Namibia and Zimbabwe, with the Atlantic Ocean to the west and the Indian Ocean to the east.

Climate

South Africa is situated south of the tropics. Climate moderated by the ocean on two sides of the country, and the altitude of the interior plateau, account for South Africa's warm temperate conditions. South Africa is a relatively dry country, with an average annual rainfall of about 464 mm. While the Western Cape Province gets most of its rainfall in winter, the rest of the country is generally a summer-rainfall region. Temperatures in South Africa tend to be lower than in other countries at similar latitudes owing mainly to greater elevation above sea level.

Demography

South Africa is divided into nine provinces and 52 districts. The estimated mid-year population in 2017 was 56.5 million with about 30% of the population aged younger than 15 years.⁸ Life expectancy at birth is estimated at 61.2 years for males and 66.7 years for females. Migration is an important factor shaping the demographics, with an average of 3.5 million people moving across the South African borders each month during the summer season.⁹ This movement has an impact on communicable diseases, especially malaria.

1.3. Organisation of the Malaria Programme in South Africa

The National Malaria Programme (NMP) in South Africa is part of the Directorate at the NDOH responsible for malaria, vector-borne and zoonotic diseases (Annexure 1, Figure 1). Dedicated Provincial Malaria Programmes exist in the three endemic provinces, namely KwaZulu-Natal, Limpopo, and Mpumalanga. In non-endemic provinces, malaria programme activities are integrated within other governmental health programmes such as Environmental Health, Health Promotion, Communicable Disease Control, Disease Surveillance, and Pharmaceutical Services.

The National Malaria Programme is responsible for developing policy and guidelines, providing technical assistance to provincial malaria programmes, building capacity of the programme at all levels, coordinating partners and cross-border collaboration, advocating for resource mobilisation, and political commitment.

⁸ Statistics South Africa 2017, Mid-Year Population Estimates 2017

⁹ Statistics South Africa 2017, Tourism 2017

Within the endemic provinces of KwaZulu-Natal, Limpopo and Mpumalanga, malaria programmes are broadly comprised of a programme manager, data manager and other support staff. Field teams in these three provinces are responsible for vector control and surveillance with respective field supervisors. The provincial malaria programmes are responsible for all implementation at provincial and district level, and for coordinating local stakeholders. South Africa's Malaria Programme receives management and technical support from several partners and stakeholders. These include UN agencies such as the WHO, which provides technical support; non-governmental organisations such as the Clinton Health Access Initiative (CHAI), which provides management and technical support; academia, such as Universities of Cape Town and Pretoria, which provide technical support; research institutions, such as the NICD and the South African Medical Research Council, which provide technical support; and the private sector, which provides support for technical issues such as surveillance in the private sector.



Chapter 2: Malaria Epidemiology in South Africa

2.1. Malaria Transmission in South Africa

South Africa is situated on the southern edge of the malaria transmission belt in sub-Saharan Africa. Local malaria transmission occurs mainly in the low altitude areas (below 1,000 meters above sea level) of the Limpopo, Mpumalanga, and KwaZulu-Natal provinces, especially in areas bordering Zimbabwe and Mozambique (Figure 1).

Malaria transmission mostly occurs in the rainy season between September and May. *Plasmodium falciparum* accounts for the majority of malaria cases in South Africa and is the predominant species associated with severe and fatal illness. Historical data from the 1930s-1950s indicate that *Anopheles (An.) funestus* and members of the *An. gambiae* complex were the main vectors. Since the 1950s, the main vector has been *An. arabiensis* (of the *An. gambiae* complex), although *An. funestus* has been associated with outbreaks and epidemics, specifically those recorded during the period 1996 to 2001. Despite limited transmission, malaria remains one of the priority diseases for the NDOH. Since the year 2000, South Africa has seen significant reductions in malaria transmission, and in 2012 the country set the goal of eliminating the disease. The country has made steady progress in spite of periodical seasonal outbreaks, sparked by importation from regional upsurges.

Malaria transmission is heterogeneous across South Africa's endemic provinces, and progress towards elimination has been similarly variable. Strategies should be tailored to the conditions of each province. In Limpopo Province, Vhembe and Mopani districts experience the highest burden of disease, while the remaining three districts (Waterberg, Sekhukhune and Capricorn) experience very low local transmission. In Mpumalanga Province, transmission is highest in the Bushbuckridge and Nkomazi municipalities of Ehlanzeni district, Mpumalanga's only endemic district. As compared to the other endemic provinces, KwaZulu-

Natal districts (Zululand, Umkhanyakude and King Cetshwayo) have reported the lowest burden of malaria cases for the years 2013-2018. Gauteng Province reported the highest number of imported cases for this period.

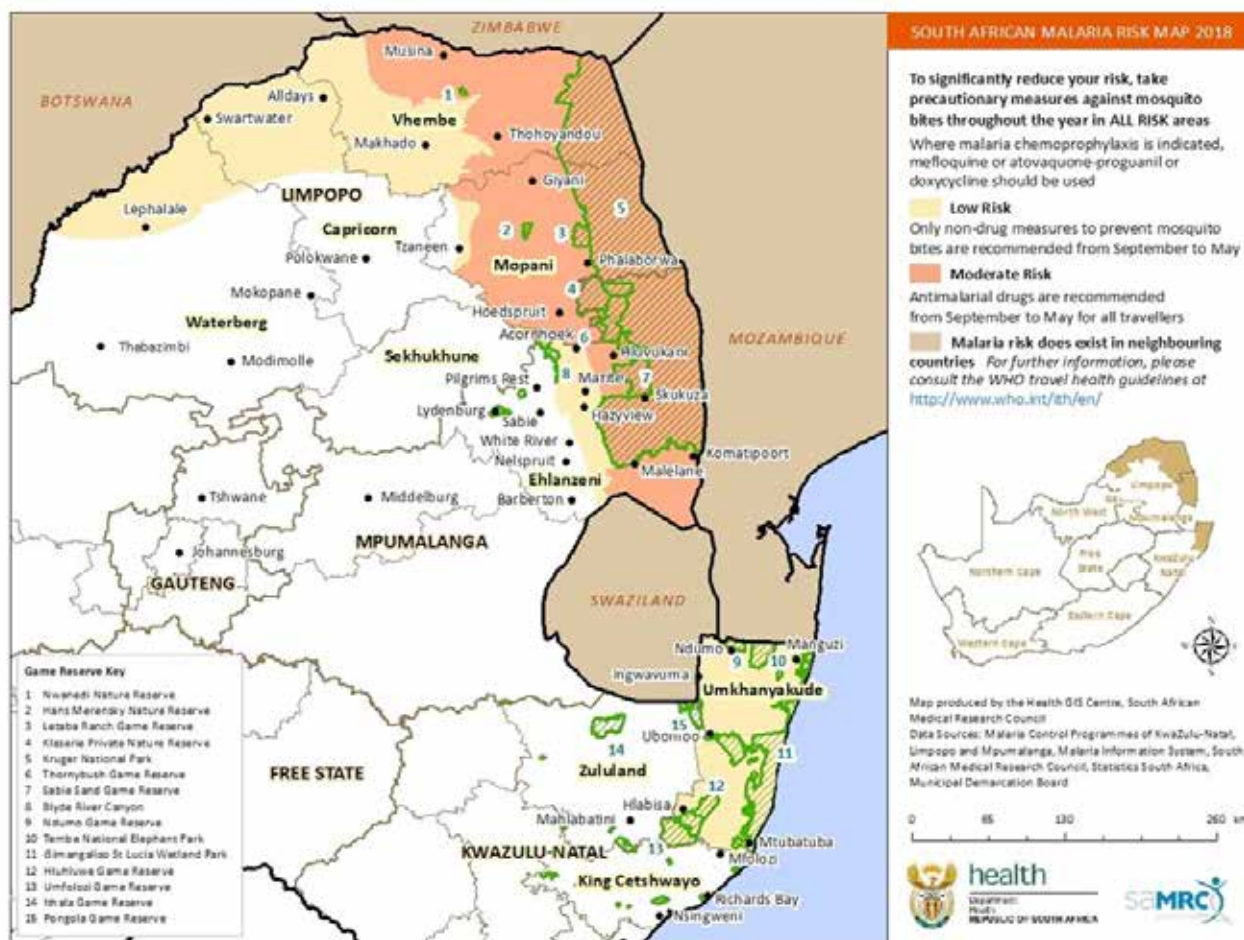


Figure 1: The distribution of risk of malaria transmission in South Africa, 2018

2.2. Malaria Morbidity and Mortality Trends

Between 2000 and 2010, malaria morbidity and mortality dropped significantly. Subsequently, from 2010 to 2018, South Africa has experienced varying degrees of success in reducing the malaria burden. There are differences in malaria incidence in the malaria endemic districts, with KwaZulu-Natal Province maintaining steady progress towards elimination. Cases in Limpopo Province have fluctuated from year to year but have shown an overall upward trend. Overall, malaria cases reduced from approximately 14,000 in 2014 to 5,800 in 2016,

and increased to 30,000 during an epidemic in 2017 in Limpopo and Mpumalanga provinces. Deaths similarly reduced from a high of 174 in 2014 to 54 in 2016, then rose to 331 during the epidemic in 2017 (Figure 2).

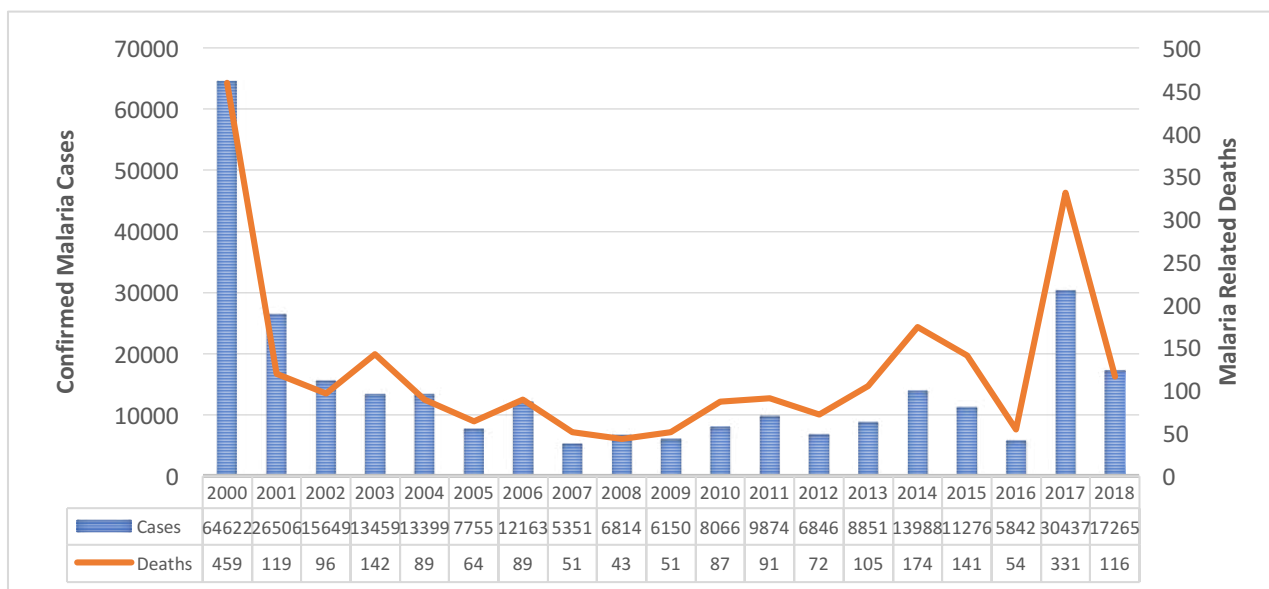


Figure 2: Total malaria cases and deaths from 2000 to 2018 in South Africa, by calendar year.¹⁰

2.3. Progress Towards Elimination

According to the WHO, malaria elimination is defined as, “[the] sustained interruption of local transmission (reduction to zero incidence of indigenous cases and prevention of reestablishment) of a specified malaria parasite species in a defined geographical area as a result of deliberate activities.”¹¹ According to the WHO, malaria burden can be categorised as high, moderate, low and very low and can be stratified as follows:

- Areas of high transmission are characterised by an annual parasite incidence of about 450 or more cases per 1,000 population and a *P. falciparum* prevalence rate of $\geq 35\%$.
- Moderate transmission areas have an annual parasite incidence of 250–450 cases per 1,000 population and a prevalence of *P. falciparum*/*P. vivax* malaria of 10–35%.

¹⁰ National Department of Health 2018 *MALSTATATA*: Financial Years 1999/2000-2010/2011, Compiled August 2018

¹¹ World Health Organization, 2017, *A Framework for Malaria Elimination*, Geneva.

- Areas of low transmission have an annual parasite incidence of 100–250 cases per 1,000 population and a prevalence of *P. falciparum*/*P. vivax* of 1–10%.
- Very low transmission areas have an annual parasite incidence of <100 cases per 1,000 population and a prevalence of *P. falciparum*/*P. vivax* malaria >0 but <1%.

South Africa’s malaria burden for each of the provinces places the country within the categories of “low to very low transmission.” Although the four WHO categories mainly focus on the need for reduction in malaria cases, there exist two additional categories of “zero” and “maintaining zero.”

This 2019-2023 malaria elimination strategy takes into account each of the categories highlighted above and has further defined its stratification as follows:

1. Very low transmission: ≤ 0.1 local cases per 1,000 population at risk in 2018 will reach zero local cases by the end of the malaria elimination strategy.
2. Low transmission: $0.1 - < 1$ local cases per 1,000 population at risk in 2018 will reach zero local cases by the end of the malaria elimination strategy.
3. Moderate transmission: ≥ 1 local cases per 1,000 population at risk in 2018 will reach zero local cases by the end of the malaria elimination strategy.

Local and unclassified malaria transmission in the endemic districts of Zululand and Vhembe range from 0.017 to 2.401 per 1,000 population at risk respectively (Table 1). There are approximately forty sub-districts where local transmission occurs in South Africa. A more detailed stratification by sub-district can be found in Annexure 3. Imported malaria cases currently constitute 63% of the total cases reported in the country, with some provinces such as KwaZulu-Natal having importation rates of more than 80%.¹²

A series of changes are required to intensify South Africa’s malaria elimination efforts, and key strategies per intervention area are defined later in this document. Overall, this strategic plan proposes a phased approach to achieve zero local transmission by targeting interventions to initially clear foci of transmission and ensuring systems are established to support elimination interventions.

12 NDOH Malaria Statistics 2018


District Incidence Rates						
Medium		Low		Very Low		
<i>Greater than 1 per 1,000 population at risk</i>		<i>Between 1 and 0.1 per 1,000 population at risk</i>		<i>Less than 0.1 per 1,000 population at risk</i>		
Province	District	Rate	District	Rate	District	Rate
Limpopo	Mopani	2.51	Greater Sekhukhune	0.06		
			Capricorn	0.12		
	Vhembe	3.79	Waterberg	0.18		
Mpumalanga			Ehlanzeni	0.69		
Kwa-Zulu Natal					Umkhanyakude	0.21
					King Cetshwayo	0.00
					Zululand	0.01

Local and unclassified cases for 2018, population figures from mid-year 2018 population estimates (Stats SA)

Unclassified = unknown + untraceable

Table 1: Provinces and districts staged along the elimination continuum, 2018.





Chapter 3: Situational Analysis – National Malaria Programme Review

3.1. Overview of the Malaria Programme Review (MPR) Findings

The NDOH undertook a programme review in 2018 to identify the key achievements of the programme, highlight challenges, and propose recommendations to help guide South Africa toward malaria elimination.¹³ The MPR found that one of the strengths of the programme is that it is funded by the government. High coverage of indoor residual spraying (IRS) (>85%) has had a significant effect in maintaining control of malaria and reducing local transmission within the country. However, funding was not sufficient to realise the goal of elimination. Health system challenges and resource mobilisation were noted as barriers. Additionally, the review found that one of the ongoing challenges was high importation risk from neighbouring malaria endemic countries.

Several recommendations arose from the malaria programme review within thematic areas: programme management, case management, vector control, advocacy and social mobilisation, surveillance, M&E and operational research. The key achievements and recommendations are highlighted below.

3.1.1 Programme Management

Effective programme management is important for driving the elimination strategy. The national malaria control programme has strong coordination structures and mechanisms in place, which enable technical expertise to inform operational processes through regular review planning meetings and national guidelines. There were several challenges in the implementation of the previous NSP, such as under-resourcing for goods and services and human resources, procurement delays and minimal routine coordination between the national and

¹³ National Department of Health 2009 Malaria Programme Review RSA

provincial programmes. The following recommendations therefore become important when considering areas for improvement:

- Advocate for authority to fill critical positions at a national and provincial level that are essential for malaria elimination. Without these positions filled, malaria resurgence is likely.
- Implement the appropriate malaria surveillance activities in all endemic and non-endemic districts, and ensure all information required for the documentation of malaria elimination is collected, analysed, used for planning and implementation, and appropriately archived.
- Implement a routine coordination mechanism between national and provincial malaria programmes and other partner programmes (for example CDC) to ensure timely implementation of critical malaria elimination activities.
- Strengthen adherence to procurement guidelines and deadlines by all parties.

3.1.2 Case Management

Guidelines for the diagnosis and treatment of malaria were updated in 2018 in line with WHO recommendations for malaria elimination. Case management training sessions were regularly conducted for all cadres of health workers, stock management for malaria medicines and diagnostics continues to be strong, and stock-outs are rare. Testing and treatment for malaria is provided free of charge to all people at primary health care facilities. The following recommendations were made:

- Improve quality of malaria diagnosis and treatment based on national guidelines at all levels (public and private sector) including primary healthcare clinics (PHCs) in non-endemic districts, through comprehensive training and dissemination of guidelines and provision of diagnostic tools, treatment and chemotherapy.
- Complete the processes required to make single low-dose primaquine available for case management at all levels, to support the interruption of malaria transmission.
- Expand diagnosis and treatment to primary healthcare level, mobile and migrant populations and local and hard-to-reach communities.

3.1.3 Vector Control

IRS is the major vector control intervention used to interrupt malaria transmission, and the country has many years of experience in implementing IRS programmes. Vector control is entirely funded by government resources, and is supported by technical guidance from national guidelines, partners, government departments and academia. Recommendations for vector control include:

- Complete procurement processes by May each year to ensure timely delivery of insecticides to field teams, enabling timely implementation of IRS.
- Undertake insecticide resistance studies to inform the selection of appropriate and efficacious insecticides for IRS.
- Recruit and retain sufficient team leaders, foremen, and spray operators to effectively guide and implement vector surveillance and control activities.
- Re-quantify areas of risk requiring IRS.
- Provide sufficient financial resources to ensure that all populations at risk of malaria transmission are covered by IRS.

3.1.4 Advocacy, Social Mobilisation and Social Behaviour Change Communication (SBCC)

Community surveillance officers and IRS spray operators are providing communities with health education on malaria prevention and treatment, despite limited resources. A Malaria Communication Strategy (2017-2022) was produced and disseminated. Recommendations include:

- Designate a dedicated fund for malaria information, education and social mobilization activities in all provinces.
- Revise the current Communication Strategy (2017-2022) to align with the new National Strategic Elimination Strategic Plan (2019-2023).
- Conduct regular studies to guide message development and health promotion activities.

3.1.5 Surveillance Monitoring and Evaluation, and Operational Research (SMEOR)

Malaria cases are notified via the Malaria Connect and paper-based reporting systems. Endemic provinces report weekly and non-endemic report monthly. Malaria death audits are conducted. NDOH generates reports monthly, quarterly and annually. Entomological surveillance activities are conducted within endemic areas. Recommendations to improve the surveillance system are listed below:

- Complete the development and roll-out of the District Health Information System 2 (DHIS2) system to simplify and standardise reporting of all malaria programme data, and incorporate data elements for routine reporting of vector control and entomological surveillance data.
- Strengthen the capacity for malaria surveillance activities for elimination through deployment of dedicated malaria community surveillance officers, with comprehensive training for all personnel on malaria elimination. Allocate sufficient resources for case and focus investigation, response, and clearance in the targeted districts.
- Incorporate a section on malaria epidemic prevention and control into malaria surveillance guidelines. Develop functional malaria EPR plans at national, provincial and district levels, and build capacity to maintain and implement them.

Each of the recommendations highlighted above have been carefully considered and informed the strategies and activities in this document, and appropriately targeted at the relevant level (National, Provincial, District) with the Department of Health.







Chapter 4: **Malaria Elimination Strategic Plan 2019-2023**

4.1. Introduction

The Malaria Elimination Strategic Plan details the vision, mission, goals, objectives, key strategies, and activities, indicators and targets for the country's malaria elimination programme. In addition to providing guidance for implementation, this strategic plan also serves as a resource mobilisation tool and highlights the appropriate indicators to track progress towards the elimination goals.

This strategic plan is closely aligned to national policy mandates, including the National Health Act and the National Development Plan, the National Department of Health Strategic Plan and the NDOH's 2019-2023 Annual Performance Plan (APP).¹⁴

This strategic plan focuses on improving overall health outcomes by strengthening the quality of health services, increasing human resource capacity, and increasing malaria knowledge, attitudes and practices of the general population, to improve health.

4.2. Vision and Mission

Vision: A malaria-free South Africa.

Achieving a malaria-free South Africa will contribute greatly towards “a long and healthy life for all South Africans.” The constitution of South Africa grants everyone in the country access to health services, enabling any individual to be appropriately tested and treated for malaria,¹⁵ including travellers and migrants to South Africa.

¹⁴ National Department of Health 2018 Annual Performance Plan, RSA

¹⁵ Constitution of the Republic of South Africa 1996. Statutes of the Republic of South Africa – Constitutional Law

4.3. Goals and Objectives

Goal: The goal of the National Malaria Elimination Strategic plan for South Africa is to achieve zero local malaria transmission in South Africa by the year 2023.

Strategic Objectives

This plan has identified five key objectives to achieve the above-mentioned goal:

1. Provide effective management, leadership and coordination for the optimal implementation of malaria elimination interventions at all levels by 2020.
2. Strengthen and sustain the surveillance system so that 100% of malaria cases are reported into the Malaria Information System (MIS) within 24 hours by 2020.
3. Ensure that 90% of the population affected by malaria receives information education communication (IEC) messaging by 2023.
4. Protect all populations at risk to achieve at least 95% coverage with key vector suppression strategies and interventions for the period 2019-2023.
5. Ensure universal access to diagnosis and treatment in endemic and non-endemic areas according to national guidelines for the period 2019-2023.

4.4. Strategies and Activities

All strategies and activities described in this plan aim to guide effective implementation of interventions to reduce malaria incidence to zero through sustained efforts, continued vigilance, and strong collaboration with key stakeholders and neighbouring countries. Targeting foci of transmission with an effective combination of established and novel tools will assist in systematically eliminating malaria by district. The increasing incidence of malaria importation across South Africa requires innovative surveillance measures to promptly and effectively detect and treat these cases to prevent severe illness and deaths, and limit the risk of onward transmission. Sustained health promotion to increase awareness of malaria prevention strategies is crucial. New tools should be explored that will assist in innovatively and systematically eliminating malaria by districts and provinces in an efficient manner.

4.4.1 Objective 1. Provide effective management, leadership, and coordination for the optimal implementation of malaria elimination interventions at all levels by 2020.

Effective management and leadership are key to providing an enabling environment to render a successful malaria elimination programme. As such, several strategies have been identified to ensure effective management, leadership and coordination to deliver a strong malaria elimination programme.

Strategy 1.1. Ensure there is an appropriately trained and skilled workforce in place to maximise the reach and impact of malaria elimination interventions.

As identified in the end term malaria programme review (July 2018), malaria elimination will be very difficult to achieve without an adequately-staffed programme that is appropriately trained and skilled. In this regard, skills at every level of the health system and malaria programme must be in place for implementing and monitoring the required interventions.

This plan identifies development of skills and increasing the number of entomologists, epidemiologists, information officers and geographic information systems (GIS) technicians, and clinical and laboratory services personnel to ensure proper malaria case management, surveillance teams including environmental health practitioners, case investigators and management personnel to coordinate and oversee malaria intervention programmes, and administrative staff to support operations and management personnel.

Identified vacant positions on approved structures at all levels should be filled immediately so that implementation can be optimised. Whilst filling of positions should be the responsibility of the malaria programmes (national and provincial), partner support should be leveraged to supplement human resource constraints as required. It is imperative that malaria programme supervisors regularly monitor staff performance using indicators that have been developed for achieving optimal implementation of malaria elimination activities and targets.

Strategy 1.2. Strengthen partnerships and coordination to support the planning, execution and monitoring of elimination efforts.

The delivery of the malaria elimination programme is led by National Department of Health, in collaboration with its supporting partners. Moreover, programme delivery hinges on effective coordination from both within and outside the malaria programme. In this regard it

is imperative that there is effective coordination of malaria activities between the national, provincial and district malaria programmes, with routine monitoring of key defined indicators in this strategic plan.

In addition, in order for the Department of Health to deliver a malaria elimination programme that achieves its goals, it will be important that it forms effective partnerships to deliver on this mandate. Programme effectiveness needs to be through regular monitoring of implementation of the intervention of strategies. Forming partnerships with other key sectors (mining, farmers' associations, taxi associations, tourism, multilateral organizations, government stakeholders, non-governmental organizations (NGOs), civil society) and the malaria elimination technical committee will be key in supporting elimination efforts. Additionally, research partners will be crucial to informing policy and decision making. The district health system should be responsible for ensuring optimal operational implementation of malaria elimination interventions.

Strategy 1.3. Ensure the timeous and adequate supply of quality-assured commodities and equipment required for malaria elimination.

A key component of the malaria elimination programme is the timely supply of commodities and equipment required for implementing core interventions such as vector control and case management. In order to ensure commodities are supplied in the accurate quantity, at the correct time and are of the specified quality, annual quantification and forecasting plans should be developed at national and provincial levels. Quality of commodities should be routinely monitored and informed by prescribed practices with the relevant partner support. Monitoring of stock management at a provincial and district level should be strengthened to ensure that there is a regular supply of specified commodities, that buffer stock is available and that there are no stock-outs at all levels of the supply chain.

Strategy 1.4. Mobilise adequate resources and maximise efficiencies of existing resources for malaria elimination.

Critical financial, human resource and commodity gaps to implement the malaria elimination strategy will be addressed through a robust resource mobilisation effort. This effort should be informed by a thorough gap analysis and development of a resource mobilisation strategy. Investments will be mobilised through optimisation and innovative financing mechanisms advocated from relevant domestic funding sources, such as approaching the National Treasury. Efficiencies in the malaria programme and opportunities for integrating with existing

health programmes at the PHC level need to be identified in order to maximise existing efficiencies. A financial gap analysis of the National Malaria Programme indicated that additional funds amounting to approximately 2 billion Rand over five fiscal years (2019/20-2023/2024) would be required to achieve malaria elimination. It is envisaged that funding from the South African Government would support the routine malaria control activities and additional resources from other donors would be sourced to support non-routine and innovative interventions (e.g. operational research to generate evidence for interventions) with a view towards elimination.

Strategy 1.5. Ensure advocacy and communication at all levels.

The support for the malaria elimination programme is required at all levels in order for it to be successful. It therefore becomes crucial that the malaria elimination strategy be informed by those most affected, and that it is communicated, supported and endorsed by decision makers, malaria programme staff and relevant stakeholders. Advocacy and communication will be targeted and implemented by the key programme management staff at all levels. Relevant research will be undertaken to determine knowledge and practice and strong M&E tools will inform areas with the greatest impact for elimination.

Strategy 1.6. Strengthen cross-border and inter-district collaboration for malaria elimination.

Given the high rate of imported malaria in South Africa, collaboration with neighbouring malaria endemic countries is fundamental to reducing importation risk and preventing local transmission. Regional initiatives such as Elimination 8 (E8), MOSASWA (Mozambique, South Africa and Swaziland (Eswatini)) and Trans-Limpopo Malaria Initiative (TLMI), need to be sustained and strengthened through establishment of cross-border operational committees, synchronisation of cross-border operations, and harmonisation of cross-border policy.

Strategy 1.7. Ensure accountability mechanisms are in place for delivering an effective malaria elimination programme.

In order for the malaria programme to achieve the elimination targets it has set out, an independent national malaria elimination council will be established. Progress towards the elimination goal must be monitored at an operational level through regular reporting of the malaria elimination scorecard at all levels.

Strategy 1.8. Ensure optimal epidemic preparedness and effective response for malaria at all levels.

Malaria programmes, through collaboration with outbreak response teams at every level, must ensure that suitable plans are in place to detect and respond rapidly and appropriately to any outbreak. EPR plans must be implemented and monitored to ensure the health system is adequately prepared to contain the spread of disease in the event of an outbreak. The national and provincial outbreak response teams, consisting of multiple stakeholders, must be involved in epidemic prevention and response.

In order to guide response to outbreaks with relevant and timely interventions, epidemic thresholds must be updated annually at all geographic levels (province, district, sub-district and facility), and monitored on a weekly and a monthly basis. Weekly meetings must be conducted at provincial level to review data and weekly reporting implemented to support ongoing monitoring towards efficient EPR. An improved procedure to collaborate and communicate with all health promotion departments in outbreak situations is required. Further, during outbreaks, mechanisms to mobilise surge capacity for data entry and for 24-hour notification compliance over weekends will be put in place to ensure surveillance information systems remain efficient and robust.

4.4.2 Objective 2. Strengthen and sustain the surveillance system so that 100% of malaria cases are reported to the malaria information system within 24 hours by 2020.

This objective will ensure:

- 24-hour notification of all confirmed malaria cases is in place,
- case investigation, active case detection and foci response activities are effectively deployed in relevant transmission settings, and
- optimal epidemic monitoring for prompt, informed response is implemented by 2020.

Strategy 2.1. Strengthen and maintain an integrated malaria information system for informed programme management, intervention and monitoring.

An integrated centralised information system that supplies comprehensive, accurate and timely data is essential for informed intervention, and programme management. A standardised DHIS2-based MIS based on the new Notifiable Medical Conditions (NMC)

notification form has been developed and has commenced implementation stages in all endemic provinces during 2018. The system captures all data necessary to measure progress against set indicators in the M&E plan to allow data-driven decision making at all levels within the programme. Integration of GIS into the DHIS2 system should further contribute to visualising data for improved operational programme planning and decision-making. In order to fully operationalise the overhauled information systems, roll-out of the DHIS2 system to all programmatic levels will be prioritised, with a strong focus on capacity building. Additional modules for intervention management, entomology, foci clearing and commodity tracking are scheduled for development and rollout, to enable fully integrated data management, analysis and decision support for elimination programming.

Strategy 2.2. Strengthen data management and review for informed programming based on high quality information.

The effective use of data for decision making and programme management is typically underutilised in most operational settings in the malaria programme. Both improved management of data being collected and its efficient and appropriate use is vital to inform control and elimination efforts. Data management and quality at collection and entry levels will be improved through development of epidemiological capacity, protocols, regular monitoring and reporting, meetings, verifications, reviews and audits. Improved use of data for informed programme management and decision support will be encouraged through development of best practice guidelines, enhanced routine reporting and development of capacity at the management and operational levels for data mining, improved data usage and analysis.

Strategy 2.3. Surveillance systems strengthening.

Strengthening surveillance throughout the country is essential to inform the status of malaria transmission and endemicity. Collaboration with Communicable Disease Control Units, Port Health, Primary Health Care community-level surveillance interventions and other government departments, will be critical. National surveillance guidelines must be updated to accommodate developments in endemicity at district and sub-district levels. Capacity must be developed to strengthen surveillance systems through conducting elimination-specific training for district and provincial surveillance personnel, further development of GIS capacity at provincial level for informed programming, and biannual meetings of provincial and national surveillance personnel.

Strategy 2.4. Strengthen passive case detection to ensure timely notification of all confirmed cases detected at all levels of the national health system.

Malaria is a notifiable disease in South Africa, with robust surveillance systems in place in all provinces. As such, rapid routine and accurate reporting from all provinces must continue to be enforced, including non-endemic provinces and private health facilities, to improve the completeness and quality of passive surveillance. Training forms an integral part of the continued strengthening of implementation of the National Surveillance Guidelines, especially with respect to the recently adopted standardised NMC notification form and other revised data collection tools to support elimination that will be implemented to ensure comprehensive and accurate data is collected for each malaria case. All confirmed cases should be notified within 24 hours, and this facility will be sustained through the USSD-based Malaria Connect reporting system until the Notifiable Medical Conditions Surveillance System (NMCSS) rapid reporting application is fully implemented. Data from the private sector within the NMCSS must be interfaced with DHIS2 to improve notification compliance and form completeness, which will support correct case investigation and classification. Malaria reporting from non-endemic provinces must be supervised and monitored in collaboration with Communicable Diseases Cluster (CDC) liaison and interface with DHIS for reporting of key patient-tracking indicators.

Strategy 2.5. Strengthen deployment of active case detection foci investigation and response activities appropriate to transmission setting.

In low transmission settings, active case detection is necessary to ensure that parasites are detected early and cleared through prompt treatment to prevent secondary or onward transmission. Case investigation will be conducted within 48 hours to 7 days in all endemic districts, depending on their transmission level. This will include reactive case detection in neighbouring households of the index case enabling detection of additional infections at community level. Reactive case detection will be accompanied by entomological surveillance and vector control enquiry, delivering reactive IRS where necessary.

Amongst vulnerable populations, such as migrant workers, travellers, seasonal farm workers, and residents in low transmission endemic areas bordering high transmission zones, and where operationally feasible, proactive case detection will be implemented.

The accurate differentiation of indigenous, imported and locally imported (from one malaria endemic area to another within the country) infections is required to inform programmatic

response and direction at all levels, and to track elimination status. Challenges with the collection of high quality case classification data must be addressed to ensure the reliability of these data for tracking trends and informing decision making. The completeness and quality of information collected during case investigation for correct case classification will be improved through (a) the implementation of training and mentorship, (b) the bolstering of case investigation capacity through contract recruitment to address gaps identified through district-level situational analysis, (c) alignment of key personnel activities with national strategy, (d) improved field supervision to optimise surveillance for elimination, and (e) implementation of protocols to improve routine data quality at all data collection levels.

Foci investigation and clearing following an enhanced protocol for surveillance and response will be implemented in targeted low transmission districts, with annual training conducted to maintain high levels of compliance, annual reclassification to assess change in functional status of individual foci, and monitoring of overall programme impact. Capacity for household-level mapping of cases must be developed in all low transmission districts.

Strategy 2.6. Update risk stratification for informed deployment of stratified intervention packages.

Informed and stratified intervention deployment is appropriate for elimination in heterogeneous transmission settings. Data and tools to support intervention targeting in different population settings and operational stratification will be developed or updated. These include (a) update of the national risk map, (c) defining the population at risk at sub-district level, (d) development of district, sub-district and locality level profiles, (e) stratification of receptivity/transmission at sub-district and operational unit levels, (g) defining the target population profile for chemoprophylaxis and other interventions.

4.4.3 Objective 3. Ensure that 90% of the population affected by malaria receives information education communication messaging by 2023.

Advocacy for health promotion and communication activities has to be contextualised within the current situation, where capacity for malaria awareness activities in both endemic and non-endemic areas is limited. There is a need to review and update the advocacy, communication and social mobilisation (ACSM) strategy with standardised messages for health promotion. Partnering with communities in determining behaviours that drive exposure and harnessing the intellectual capital to find joint solutions is essential for social mobilisation. Factors that need to be considered when developing a health promotion strategy include the

perception of low malaria risk among policy makers, healthcare workers and communities. South Africa's culturally diverse population, migrant populations, community perceptions of IRS and of healthcare in general, the vertical nature of the malaria programme, the re-engineered primary healthcare service delivery model, and the limited existing resources, are all important considerations for inclusion in the health promotion strategy. Malaria elimination advocacy, health promotion and communication activities will be included in the operational plans at national, provincial and district level.

Strategy 3.1. Strengthen advocacy to decision makers and opinion leaders.

Health promotion and communication for malaria elimination activities should specifically be directed at the recreational traveller or migrant labourer, and will need to be disseminated at border posts, taxi and bus stations and workplaces, using the most appropriate information, education and communication materials. Further innovative methods of communication, such as digital media platforms and smartphone applications, should be developed and used by healthcare professionals and the inquiring traveller. This should incorporate a malaria risk map, pictorial information on the vector and parasite, methods of prevention, signs and symptoms, and resources where further information can be obtained.

Advocacy and health promotion activities should occur in the endemic provinces as well as non-endemic provinces, where imported cases and deaths are challenges. These should reach health practitioners, decision makers, communities and travellers.

Strategy 3.2. Social and community mobilisation.

Social mobilisation will include strengthening communication to high risk groups at community level through the development of standardised malaria messages delivered through community education campaigns and door-to-door health education. This increased interaction between health educators and the community will raise awareness about malaria elimination and is expected to increase uptake of malaria preventive interventions throughout the country. Malaria IEC using tailored messages and a variety of communication channels will need to be continued to ensure that communities and travellers moving to and from malaria endemic areas take the necessary precautions and actions to prevent initial infection and onward transmission.

Strategy 3.3. Behaviour Change Communication.

Behavioural change communication (BCC) strengthens all strategic components of malaria control and prevention programmes by supporting delivery of interventions like case management improvement, integrated vector management (IVM), surveillance, and programme management. BCC is an interactive process with communities that develops tailored messages to increase knowledge of malaria. For instance, BCC includes stimulating social and communication dialogue, promoting essential attitude change and creating demand for information and services. Its primary goal is to facilitate positive behavioural change and capacity building through the provision of correct and relevant information to empower people for more effective decision-making in utilizing health services. A knowledge, attitudes and practices (KAP) survey will inform the BCC strategy for malaria elimination in South Africa.

Communication activities targeting high-risk populations, including travellers, migrants and refugees must involve development of relevant and targeted messages. Targeted messaging includes distribution of IEC material at the ports of entry, and training of stakeholders and partners on elimination to disseminate key messages.

Messages should be disseminated throughout the year with intensification leading up to malaria season and around the peak holiday seasons (December and April), when there is significant population movement within South Africa and across borders. Communication should emphasise personal protection and the importance of early treatment-seeking behaviour.

4.4.4 Objective 4. Protect all populations at risk to achieve at least 95% coverage with key vector suppression strategies and interventions for the period 2019-2023.

The suppression of malaria vector populations is a key intervention in malaria control and elimination. Effective vector control is best achieved by the judicious use of insecticides, and can be enhanced by environmental management and the incorporation of additional technologies and strategies, especially those designed to target outdoor biting *Anopheles* mosquitoes. Achieving sufficient vector control coverage is dependent on correctly identifying populations at risk in affected districts/municipalities and deploying adequate interventions to them. The efficacy of interventions should be monitored and improved by ongoing entomological surveillance and response, with special emphasis on larval source management and periodic assessments of susceptibilities to insecticides in target mosquito populations. Targeting foci of transmission within endemic provinces with an effective combination of known interventions and new tools will also assist in systematically eliminating malaria in South Africa.

Strategy 4.1. Implement targeted, timely, quality assured IRS to achieve 95% coverage year-on-year using at least 2 insecticide classes guided by susceptibility profiles.

Implementation of annual IRS, incorporating the management of insecticide resistance, is South Africa's primary method of vector control. This intervention is mainly responsible for the reduction of malaria incidence to a point where elimination is possible, and its effectiveness therefore needs to be maintained and even enhanced by careful micro-planning at the sub-district level, and commodity procurement at the provincial and national levels. The timely implementation of provincial IRS programmes and subsequent quality assurance (QA) assessments each year is essential for effective malaria control leading to elimination.

Strategy 4.2. Implement ongoing entomological surveillance & response by 2019.

Entomological surveillance-response refers to interventions that are based on surveillance activities that provide direct and actionable information for vector control. Specifically, the identification and geo-location of *Anopheles* breeding sites in at-risk localities will allow for immediate and ongoing larval source management. Annual assessments of insecticide susceptibilities in vector populations at selected sentinel sites in districts under IRS control will allow for refinements to the insecticide resistance management strategies currently in place. Routine, monthly entomological surveillance at sentinel sites will enable the tracking of changes in vector species composition and the construction of area-wide vector distribution maps for future receptivity assessments. Vector surveillance should also continue to form part of each endemic province's foci clearing programme and outbreak response plan. Partner institutions including the NICD and SAMRC will provide technical support (*Anopheles* species identification, vector incrimination and insecticide resistance detection) as well as training and periodic refresher training in field and laboratory vector surveillance methods to provincial entomology team members and environmental health practitioners. Monitoring of entomological indicators will form part of the regular monthly, quarterly and annual reports stipulated in the M&E plan.

Strategy 4.3. In response to outbreaks, conduct site-directed vector surveillance and control.

Provinces, districts, sub-districts and health facilities, through collaboration with outbreak response teams at every level, should ensure that suitable plans are in place to respond rapidly and appropriately to any outbreak. Such plans should include focal IRS, larviciding and entomological surveillance to assess the potential for ongoing receptivity in affected areas.

Strategy 4.4. Conduct ongoing operational research in collaboration with partner institutions.

Despite intensive IRS-based vector control in endemic districts, low-level malaria transmission persists. It is therefore important to identify the entomological drivers of residual transmission in affected districts. Specifically, the contribution of outdoor-biting vectors to ongoing transmission should be assessed, as should the intensity and operational significance of insecticide resistance where it occurs. New and alternative vector control methods and products should be assessed for their potential to enhance vector control in South Africa, especially in terms of interrupting residual transmission. It has long been recognised that such evaluations are best conducted within the framework of surveillance-based operational research projects in collaboration with, and led by, partner institutions.

4.4.5 Objective 5. Ensure universal access to diagnosis and treatment in endemic and non-endemic areas according to national guidelines for the period 2019-2023.

Prompt diagnosis and treatment with effective tools is crucial to reducing malaria morbidity and mortality as South Africa progresses towards malaria elimination. The national treatment and QA guidelines must be strictly followed to ensure quality case management practices and procedures are delivered down to the community level. In addition, single low-dose primaquine must be added to the standard treatment for uncomplicated malaria in endemic areas earmarked for malaria elimination. Chemoprophylaxis should be made available to all travellers visiting at-risk areas.

Strategy 5.1. Ensure universal access to quality malaria diagnosis by 2021.

In line with Pillar 1 of the WHO's Global Strategy for Malaria, South Africa will provide universal access to prompt and accurate malaria diagnosis down to the community level by 2021. This strategy aims to reduce delays in diagnosis and the possible onset of malaria complications by ensuring point-of-care diagnosis as close to the affected communities as feasible. Integral to this strategy is ensuring all cadres of health workers are competent in the relevant malaria diagnostics through rigorous proficiency testing and QA assessments. In addition, microscopy capacity at the provincial laboratories will be developed and maintained to facilitate the detection and identification of all human malaria parasite species.

Strategy 5.2. Ensure microscopy and RDTs are regularly assessed and improved.

The NDOH is ultimately responsible for malaria case management for elimination, including diagnosis. The NICD provides technical expertise and assisted with the development of the

NDOH-coordinated National Malaria Diagnosis Quality Assurance Guidelines. The malaria microscopy QA system requires efficient coordination and advocacy to be effective. External competency assessment in malaria microscopy is needed to assess the competence of the national core group of malaria microscopists. Participation by all malaria laboratories in external quality assessment (EQA) will be important to provide an external unbiased evaluation of laboratory performance. Regular training, assessment and quality control will be done to ensure high standard of microscopy is maintained. Monitoring of rapid diagnostic test (RDT) results is done as part of drug resistance monitoring. This is restricted by the number of tests available for checking, and gives limited information about quality of test and operator performance. In-use quality assessment through outreach training and supportive supervision will be considered.

For laboratories, participation in the national EQA programme will partly assist, as RDT challenges are occasionally included. At a clinic level, witnessed test performance as part of routine supervisory visits will be used for checking all aspects of the testing procedure and for providing corrective training. The EQA Guidelines advocate for case management and laboratory quality supervisors, who can assess and train the clinic staff that routinely use RDTs. The production of positive and negative control EQA samples on a sufficient scale to assist this process will be considered. Regular training and competence monitoring of supervisors at reference laboratory level is also required.

Strategy 5.3. Ensure universal access to quality treatment for uncomplicated malaria by 2021.

Artemisinin-based combination therapies (ACT) are currently recommended by the WHO as first-line treatment for uncomplicated falciparum malaria. In an effort to halt progression to severe malaria and markedly decrease malaria mortality, South Africa should continue providing WHO-recommended first-line antimalarial treatment free of charge to all individuals diagnosed with malaria within its borders. Many countries within the region have successfully extended malaria case management directly into communities through community health workers by capacitating them to test for malaria and immediately provide treatment for uncomplicated falciparum malaria. This extension of care directly into communities is seen as a critical step towards eliminating malaria within an endemic area. South Africa will therefore need to aim to deliver universal access to efficacious treatment down to the community level by 2021. As the country's low transmission intensity makes conducting therapeutic drug efficacy trials extremely challenging, South Africa should continue to monitor drug efficacy through the routine surveillance for validated molecular markers of antimalarial resistance.

Strategy 5.4. Ensure universal access to quality treatment for severe malaria by 2020.

To decrease the malaria fatality rate in the country, early diagnosis and prompt treatment must be prioritised. Intravenous artesunate, the parenteral antimalarial medicine currently recommended by the WHO for the treatment of severe malaria, must be first-line treatment for severe malaria at hospitals by 2020. An integrated sustainable system to ensure confidential inquiry into malaria deaths must be established at provincial level to identify avoidable factors contributing to deaths. The reports of the inquiries will be aggregated quarterly at district, provincial and national levels and reviewed by technical experts. Recommendations by the experts for improvement will be integrated into malaria case management training programmes for health care workers in the public and private sectors in both endemic and non-endemic provinces. Healthcare system failures identified will also be addressed through appropriate channels. Effective and efficient supply-chain management of anti-malarial drugs will ensure that recommended parenteral drugs are available at all facilities treating severe forms of the disease. Appropriate guidance on the effective management of severe malaria will be provided to healthcare workers at all public and private health care facilities via written guidelines, protocols and mentorship programmes.

Strategy 5.5. Administration of single low-dose primaquine to eligible population groups in line with national guidelines by 2020.

In an effort to halt secondary transmission and accelerate towards malaria elimination, South Africa should roll out the WHO-recommended gametocytocidal agent, single low-dose primaquine, within malaria endemic areas. As the drug is not registered in South Africa, implementation of the single low-dose primaquine policy will take place under a Section 21 waiver. Roll out of primaquine will be in phased manner, commencing in the endemic districts closest to malaria elimination during the 2018/2019 malaria season. It is envisaged that complete coverage within the malaria endemic districts will be achieved by 2020. Concurrently with the rollout of single low-dose primaquine, efforts will be made to register the drug to enable use without Section 21 authorisation.

Strategy 5.6. Explore optimal delivery of malaria chemoprophylaxis for travellers to malaria-endemic areas.

There is the strong need for advocacy for all individuals travelling to malaria-endemic areas to take pre-exposure chemoprophylaxis. The provision of chemoprophylaxis to travellers will help reduce both the malaria morbidity by preventing infection in non-immune individuals, and prevent onward transmission and potential re-establishment of local transmission in areas previously cleared of malaria. South Africa is committed to explore and implement the optimal mechanism for the delivery of chemoprophylaxis by 2020. Doxycycline is already available on the essential drugs list and should be explored as an option for chemoprophylaxis for non-pregnant adults and children over the age of 8 years within the public health sector. Atovaquone-proguanil products are currently very costly and therefore will not be considered as a free chemoprophylactic option within this strategic plan.

4.5. Epidemiological Milestones

As described previously, there are nine malaria endemic districts and 40 endemic sub-districts in South Africa as of 2018. To systematically eliminate malaria from South Africa and measure progress toward this goal, this strategic plan sets sub-district level targets for elimination based on current epidemiology below.

District Epidemiological Milestones toward Malaria Elimination 2023

1. By 2021, 20 sub-districts with ≤ 0.1 local cases per 1,000 population at risk in 2018 will reach zero local cases.
2. By 2022, an additional 10 sub-districts with $0.1 < 1$ local case per 1,000 population at risk in 2018 will reach zero local cases.
3. By 2023, the final 10 sub-districts with ≥ 1 local case per 1,000 population at risk in 2018 will reach zero local cases.

4.6. Policy Considerations

In moving toward elimination, there are policy issues that must be addressed by the NDOH and NMP. Currently, health care workers are not permitted to provide immediate malaria treatment at the community level following a positive diagnosis in the field. The NDOH must explore this and other policy changes that will serve to capacitate malaria programmes at

the provincial and district levels. The integration of PHC with malaria surveillance teams in the community and the border areas to provide treatment with ACTs at the community level is an important policy that needs to be implemented to stop the spread of parasites.

4.7. Logical Framework

The logical framework (Table 2) provides a conceptual framework for monitoring and evaluating the Malaria Elimination Strategic Plan. Further information on M&E is included in the corresponding Monitoring and Evaluation Plan,¹⁶ which appears as a separate document.

16 National Department of Health 2012, Republic of South Africa Malaria Elimination Monitoring and Evaluation Plan 2012-2018

Table 2: The logical framework for malaria elimination monitoring and evaluation

Objective	Indicator	Data Source	Frequency of Reporting	Responsible Person
Goal: To achieve zero local malaria transmission in South Africa by 2023	Number of local malaria cases	NMIS	Weekly / Monthly / Quarterly / Annually	National Malaria Manager, Provincial Malaria Managers
	Number of malaria deaths (local)	NMIS	Weekly / Monthly / Quarterly / Annually	National Malaria Manager, Provincial Malaria Managers
	Number of malaria deaths (imported)	NMIS	Weekly / Monthly / Quarterly / Annually	National Malaria Manager, Provincial Malaria Managers
	Local malaria cases per 1000 population at risk	NMIS	Monthly / Quarterly / Annually	National Malaria Manager, Provincial Malaria Managers
	Number of districts and sub-districts with zero local malaria cases	NMIS	Monthly / Quarterly / Annually	National Malaria Manager, Provincial Malaria Managers
Objective 1. Provide effective management, leadership and coordination for the optimal implementation of malaria elimination interventions at all levels by 2020	Proportion of budgeted funds released (from total required)	Provincial Malaria Programme	Quarterly / Annually	National Malaria Manager, Provincial Malaria Managers
	Proportion of funds spent from those released	Provincial Malaria Programme	Quarterly/ Monthly	National Malaria programme, provincial malaria managers
	Number of top 10 registered corporations that invest in malaria	Provincial Malaria Programme	Monthly / Quarterly / Annually	National Malaria Manager, Provincial Malaria Managers
	Proportion of vacant positions filled	Provincial Malaria Programme	Annually	National Malaria Manager, Provincial Malaria Managers
	Proportion of health sector workplans which contain malaria elimination	Provincial Malaria Programme	Annually	National Malaria Manager, Provincial Malaria Managers
	Number of functional operational cross-border committees with annual malaria elimination plans	Provincial Malaria Programme	Quarterly / Annually	National Malaria Manager, Provincial Malaria Managers
	Proportion of priority research issues addressed	Provincial Malaria Programme	Annually	National Malaria Manager, Provincial Malaria Managers

Table 2: The logical framework for malaria elimination monitoring and evaluation

Objective	Indicator	Data Source	Frequency of Reporting	Responsible Person
Objective 2. Strengthen and sustain the surveillance system so that 100% of malaria cases are reported into the MIS within 24 hours by 2020	Percent of facilities reporting weekly, including zero reporting in endemic districts	DHIS	Weekly	Provincial Malaria Managers / CDC Coordinators
	Annual blood examination rate per district (RDT/ microscopy)	MIS	Monthly	Provincial Malaria Managers
	Proportion of confirmed cases that have been correctly classified	MIS	Monthly	Provincial Malaria Managers
	Proportion of foci investigated and classified within 72 hours	MIS	Monthly	Provincial Malaria Managers
	Proportion of confirmed outbreaks responded to within 72 hours	MIS	Monthly	Provincial Malaria Managers
	Ratio of index cases to secondary detected cases	NMIS, DHIS	Weekly	Provincial Malaria Managers / CDC Coordinators
	Proportion provinces submitting monthly and quarterly progress reports	NMIS	Monthly / Quarterly / Annually	Provincial Malaria Managers
	Proportion confirmed malaria cases notified within 24 hours of diagnosis	MIS	Health facility to district and province in 24hrs; provincial reports weekly to national	Provincial Malaria Managers / CDC Coordinators
	Proportion malaria cases stratified by source of infection (local or imported)	MIS, DHIS	Health facility to district and province in 24hrs; provincial reports weekly to national	Provincial Malaria Managers / CDC Coordinators
	Proportion notified malaria cases investigated within 48 hours or 7 days of notification	NMIS, MIS	Weekly from District to province; Province reports monthly to National	Provincial Malaria Managers
	Proportion positive cases identified through active case detection	MIS	24 hours	Provincial Malaria Managers
	Proportion confirmed malaria cases mapped per district	MIS	Weekly	Provincial Malaria Managers
	Proportion active malaria transmission foci cleared	MIS	Annually	Provincial Malaria Managers

Table 2: The logical framework for malaria elimination monitoring and evaluation				
Objective	Indicator	Data Source	Frequency of Reporting	Responsible Person
	Proportion notified malaria cases in the national malaria database	MIS, DHIS, Notification Forms	Annually	National Malaria Manager
	Proportion facilities, districts reporting into DHIS2	NMIS, DHIS	Annually	Provincial Malaria Managers
Objective 3. Ensure that 90% of the population affected by malaria receives information education communication (IEC) messaging by 2023.	Proportion of population reached through malaria IEC on malaria prevention and early health-seeking behaviour interventions	NMIS, MIS, DHIS	Annually	Provincial Malaria Managers
	Number of targeted sessions with decision makers	Provincial Malaria Programme	Annually	Provincial Malaria Managers
	Number of community and social mobilisation engagements conducted	Provincial Malaria Programme	Annually	Provincial Malaria Managers
	Number of HP activities conducted during outbreaks	Provincial Malaria Programme	Annually	Provincial Malaria Managers
	Number of endemic provinces that conducted KAP studies	Provincial Malaria Programme	Annually	Provincial Malaria Managers
Objective 4. Protect all populations at risk to achieve at least 95% coverage with key vector suppression strategies and interventions for the period 2019-2023.	Proportion of targeted population at risk protected by IRS	NMIS, MIS, DHIS	Annually	Provincial Malaria Managers, Provincial Entomologists / VC
	Proportion of population covered by IRS in targeted transmission foci	MIS	Annually	Provincial Malaria Managers
	Proportion of districts / sub-districts submitting electronic entomological surveillance reports	NMIS, MIS, DHIS	Weekly / Monthly	Provincial Malaria Managers, Provincial Entomologists / VC
	Number of entomological assessments conducted during outbreaks	NMIS, MIS, DHIS	Annually	Provincial Malaria Managers, Provincial Entomologists / VC

Table 2: The logical framework for malaria elimination monitoring and evaluation

Objective	Indicator	Data Source	Frequency of Reporting	Responsible Person
Objective 5. Ensure universal access to diagnosis and treatment in endemic and non-endemic areas according to national guidelines for the period 2019-2023	Proportion of malaria cases confirmed by RDT or microscopy	NMIS, MIS, Facility Logs	Weekly	Provincial Malaria Managers, Facilities; CDC
	Proportion of confirmed, uncomplicated or asymptomatic malaria cases treated with recommended, first-line treatments	NMIS, MIS, Facility Logs	Weekly	Provincial Malaria Managers, Facilities; CDC
	Proportion of confirmed severe malaria cases treated with recommended first-line treatments	NMIS, MIS, Facility Logs	Weekly	Provincial Malaria Managers, Facilities
	Proportion of malaria deaths with complete malaria mortality audit report	NMIS, MIS, Facility Logs	Monthly	Provincial Malaria Managers, Facilities; CDC
	Proportion of endemic targeted sub-districts implementing test and treat at the household level	NMIS, MIS, CHW Training Records	Quarterly	Provincial Malaria Managers; CDC
	Proportion of health facilities reporting no stock outs (RDTs and anti-malarials)	NMIS, MIS	Quarterly	Provincial Malaria Managers; CDC





Chapter 5: Implementation Plan and Budget

5.1. Implementation Plan

5.1.1 Planning

The annual planning cycle is from April to March, in line with the fiscal year in South Africa. The National Malaria Elimination Strategy has been aligned to the outcome-based Medium-Term Strategic Framework (MTSF) of Government for 2019-2023. The malaria indicators in the National and Provincial APPs must therefore be based on the targets outlined in the Malaria Elimination Strategic Plan. Annual planning and review meetings will be conducted at every level once per year, and the NDOH will generate its annual operational plan based on the national review meeting. All malaria related operational plans and operational research at all levels must be based on the Malaria Elimination Strategic Plan requirements and targets.

National and provincial plans will also be used to inform budgeting. The NMP and provinces have submitted a budget to the Treasury Department bid for elimination based on the costs included here, as described in 5.2: Budget.

5.1.2 Implementation of the Malaria Elimination Strategic Plan

The national and provincial malaria elimination implementation plans describe the systematic approach provincial programmes will take toward elimination by 2023. All non-endemic provinces (Eastern Cape, Free State, Gauteng, Northern Cape, North West and Western Cape) must use this strategic plan to implement interventions that are appropriate for their respective epidemiological, entomological, and operational contexts. Within the Department of Health, the following units are expected to support the Malaria Directorate in implementation of the strategic plan where appropriate and as indicated in the implementation matrix: Health Promotion, Strategic Planning, Health Information, Epidemiology and Research, Hospital Services and

Facilities Management, Information Communication Technology, Medicine Regulatory Affairs, Pharmaceutical Economic Evaluations, District Health Information Services, and Environmental Health. It should be noted that this list is not exhaustive and other units, such as Legal Services, may be called upon whenever they are needed.

5.1.3 Partnerships

Proper implementation of the malaria elimination programme requires adequate funding, personnel, commodities and other resources. Such support may be received through collaboration with partners including other government departments (Environmental Affairs, Home Affairs, Agriculture, Water Affairs, etc), research institutions, community organisations, NGOs, development partners, and the private sector. Partnerships with neighbouring governments must be strengthened to address regional case importation (e.g. MOSASWA Cross-Border Malaria Initiative). Functional malaria elimination committees and advisory groups must also be in place to offer technical and management guidance to malaria programmes at all levels. The partners will all adhere to this strategic plan and the malaria Monitoring and Evaluation Plan.

The implementation plan matrix (Table 3) indicates partners that can support implementation on particular activities based on their interests and expertise. This list is not exhaustive but provides an indication of expected collaboration with the NDOH on elimination.

Table 3. The Implementation Plan									
Objective 1. Provide effective management, leadership and coordination for the optimal implementation of malaria elimination interventions at all levels by 2020									
Strategy	Activity	Responsible Group(s)	Partners	2019	2020	2021	2022	2023	
Strategy 1.1. Ensure there is an appropriately trained and skilled workforce in place to maximise the reach and impact of malaria elimination interventions	Activity 1.1.1. Ensure that malaria programmes are adequately staffed at all levels to achieve malaria elimination	NDOH, PDOH	E8, MOSASWA, CHAI, NICD, SAMRC	X	X	X	X	X	
	Activity 1.1.2. Ensure routine training and supervision of all staff at all levels	NDOH, PDOH	E8, MOSASWA, CHAI, NICD, SAMRC	X	X	X	X	X	
	Activity 1.1.3. Ensure that routine HR development and performance management is effectively undertaken	NDOH, PDOH		X	X	X	X	X	

Table 3. The Implementation Plan									
Objective 1. Provide effective management, leadership and coordination for the optimal implementation of malaria elimination interventions at all levels by 2020									
Strategy	Activity	Responsible Group(s)	Partners	2019	2020	2021	2022	2023	
Strategy 1.2. Strengthen partnerships and coordination to support the planning, execution and monitoring of elimination efforts	Activity 1.2.1 Conduct quarterly malaria workshops by thematic area	NDOH, PDOH	CHAI, NICD, SAMRC	X	X	X	X	X	
	Activity 1.2.2. Conduct MCP annual review and planning meetings	NDOH, PDOH	CHAI, NICD, SAMRC	X	X	X	X	X	
	Activity 1.2.3. Establish collaboration with relevant government departments	NDOH, PDOH		X	X	X	X	X	
	Activity 1.2.4. Establish a partnership forum with all malaria partners and ensure annual meetings	NDOH, PDOH	E8, CHAI, MOSASWA, NICD, SAMRC	X	X	X	X	X	
	Activity 1.2.5. Develop priority setting for malaria research which is communicated to relevant academics and research partners	NDOH, PDOH	NICD, SAMRC, Wits, UCT, UP	X	X	X	X	X	
	Activity 1.2.6. Integrate malaria planning and coordination with councils and community based structures	NDOH, PDOH, District Office		X	X	X	X	X	
Strategy 1.3. Ensure the timely and adequate supply of quality assured commodities and equipment required for malaria elimination	Activity 1.3.1. Develop an annual commodity quantification and forecast plan	NDOH, PDOH	CHAI	X					
	Activity 1.3.2. Strengthen stock management and reporting systems to include malaria	NDOH, PDOH		X					
Strategy 1.4. Mobilise adequate resources and maximise efficiencies of existing resources for malaria elimination	Activity 1.4.1. Mobilise resources to support the national strategic plan	NDOH	UCSF, CHAI, NICD, SAMRC	X					
Strategy 1.5. Ensure advocacy and communication at all levels	Activity 1.5.1. Strengthen advocacy to decision makers and opinion leaders	NDOH, PDOH			X	X	X	X	
Strategy 1.6. Strengthen cross-border and inter-district collaboration for malaria elimination	Activity 1.6.1. Establish cross border committees for supporting, planning, implementation and M&E in identified border districts	NDOH, PDOH, District Office	E8, CHAI, MOSASWA,	X					

Table 3. The Implementation Plan

Objective 1. Provide effective management, leadership and coordination for the optimal implementation of malaria elimination interventions at all levels by 2020

Strategy	Activity	Responsible Group(s)	Partners	2019	2020	2021	2022	2023
Strategy 1.7. Ensure accountability mechanisms are in place for delivering an effective malaria elimination programme	Activity 1.7.1. Establish and operationalise national and sub-national malaria elimination councils	NDOH, PDOH	E8, MOSASWA, CHAI, NICD, SAMRC	X				
Strategy 1.8. Ensure optimal epidemic preparedness and effective response for malaria at all levels	Activity 1.8.1. Review and update EPR thresholds at all levels	NDOH, PDOH	CHAI, NICD SAMRC	X		X		X
	Activity 1.8.2. Review and standardise EPR checklists, plans, and protocols	NDOH, PDOH	CHAI, NICD SAMRC	X		X		X
	Activity 1.8.3. Develop a coordinated response plan for malaria outbreaks	NDOH, PDOH	CHAI, NICD SAMRC	X	X	X	X	X

Objective 2: Strengthen and sustain the surveillance system so that 100% of malaria cases are reported into the malaria information system within 24 hours by 2020.

Strategy	Activity	Responsible Group(s)	Partners	2019	2020	2021	2022	2023
Strategy 2.1. Strengthen and maintain an integrated malaria information system for informed programme management, intervention and monitoring	Activity 2.1.1. Implementation of integrated information systems and related infrastructure on DHIS2 Platform	NDOH, PDOH	CHAI	X	X			
	Activity 2.1.2. Capacity development for improved uptake of integrated DHIS2 based information systems	NDOH, PDOH	CHAI, SAMRC			X	X	X
	Activity 2.1.3. Capacity development to improve data usage and analysis to support informed programme management and decision making	NDOH, PDOH	CHAI, NICD, SAMRC	X	X	X	X	X
	Activity 2.1.4. Geolocation of cases at household level in eliminating districts and foci clearing areas	NDOH, PDOH	CHAI, NICD, SAMRC	X	X	X	X	X

Objective 2: Strengthen and sustain the surveillance system so that 100% of malaria cases are reported into the malaria information system within 24 hours by 2020.

Strategy	Activity	Responsible Group(s)	Partners	2019	2020	2021	2022	2023
Strategy 2.2 Strengthen data management and review for informed programming based on high quality information	Activity 2.2.1. Improve data quality at collection and entry levels through development of protocols, regular monitoring, verification, reviews, and audits	NDOH, PDOH	CHAI, NICD, SAMRC	X	X			
	Activity 2.2.2. Capacity development to improve data usage and analysis to support informed programme management and decision making	NDOH, PDOH	CHAI, NICD, SAMRC	X	X	X	X	X
Strategy 2.3 Surveillance systems strengthening	Activity 2.3.1. Update national surveillance guidelines	NDOH	CHAI, NICD, SAMRC	X		X		
	Activity 2.3.2. Capacity development to strengthen surveillance systems	NDOH	CHAI, NICD, SAMRC					
	Activity 2.3.3. Conduct biannual meetings of provincial information officers and national surveillance personnel	NDOH	CHAI, NICD, SAMRC	X		X		X
Strategy 2.4 Strengthen passive case detection to ensure timely notification of all confirmed cases detected at all levels of the national health system	Activity 2.4.1. Ensure all confirmed cases are notified within 24 hours	NDOH, PDOH	CHAI, NICD, SAMRC	X	X	X	X	X
	Activity 2.4.2. Ensure correct completion of notification form to facilitate or improve case classification	NDOH, PDOH	CHAI, NICD, SAMRC	X	X	X	X	X
	Activity 2.4.3. Improve patient tracking by implementing/updating tools for key indicators (suspected cases, numbers tested, zero reporting) (draw from DHIS)	NDOH, PDOH	CHAI, NICD, SAMRC	X	X	X	X	X
	Activity 2.4.4. Improve data quality on new notification forms	NDOH, PDOH	CHAI, NICD, SAMRC	X	X	X	X	X

Objective 2: Strengthen and sustain the surveillance system so that 100% of malaria cases are reported into the malaria information system within 24 hours by 2020.

Strategy	Activity	Responsible Group(s)	Partners	2019	2020	2021	2022	2023
Strategy 2.5. Strengthen deployment of active case detection foci investigation and response activities appropriate to transmission setting	Activity 2.5.1. Conduct reactive surveillance in endemic districts within defined radius of index case	NDOH, PDOH	CHAI, NICD, SAMRC	X	X	X	X	X
	Activity 2.5.2. Conduct proactive surveillance in eliminating districts (stratify indicator by level of transmission)	NDOH, PDOH	CHAI, NICD, SAMRC	X	X	X	X	X
	Activity 2.5.3. Conduct case investigation within 48 hours and 7 days in endemic districts (stratify indicator by level of transmission)	NDOH, PDOH	CHAI, NICD, SAMRC	X	X	X	X	X
	Activity 2.5.4. Validate and verify case classification	NDOH, PDOH	CHAI, NICD, SAMRC	X	X	X	X	X
	Activity 2.5.5. Implement foci clearing in low transmission districts	NDOH, PDOH	CHAI, NICD, SAMRC	X	X	X	X	X
Strategy 2.6. Update risk stratification for informed deployment of stratified intervention packages	Activity 2.6.1. Update national risk map	NDOH, PDOH	CHAI, NICD, SAMRC	X		X		X
	Activity 2.6.2. Develop national modelled receptivity map at finest resolution available	NDOH, PDOH	CHAI, NICD, SAMRC	X	X	X	X	X
	Activity 2.6.3. Define population at risk at sub-district level	NDOH, PDOH	CHAI, NICD, SAMRC	X			X	

Objective 3: Ensure that 90% of the population affected by malaria receives information education communication (IEC) messaging by 2023

Strategy	Activity	Responsible Group(s)	Partners	2019	2020	2021	2022	2023
Strategy 3.1. Strengthen advocacy to decision makers and opinion leaders	Activity 3.1.1. Convene briefings with regional, national and political leadership	NMP, PMP, Health Promotion, Communication	CDC, Environmental Health	X	X	X	X	X
Strategy 3.2. Social and community mobilisation	Activity 3.2.1. Strengthen social mobilisation among all populations	NMP, PMP, Health Promotion, Communication	CDC, Environmental Health	X	X	X	X	X
	Activity 3.2.2. Develop and disseminate information, education and communication material on malaria prevention and treatment	NMP, PMP, Health Promotion, Communication	CDC, Environmental Health	X	X	X	X	X
	Activity 3.2.3. Develop and disseminate material on malaria prevention and treatment for mass media and social media outlets	NMP, PMP, Health Promotion, Communication	CDC, Environmental Health	X	X	X	X	X

Strategy 3.3. Behaviour change communication	Activity 3.3.1. Evaluate awareness and knowledge of malaria prevention and elimination in malaria endemic provinces	NMP, PMP, Health Promotion, Communication	MRC, NICD, UP, WITS, UCT	X	X	X	X	X
	Activity 3.3.2. Review and revise the malaria communication strategy	Communication	NMP, PMP, Health Promotion	X	X	X	X	X

Objective 4. Protect all populations at risk to achieve at least 95% coverage with key vector suppression strategies & interventions for the period 2019-2023								
Strategy	Activity	Responsible Group(s)	Partners	2019	2020	2021	2022	2023
Strategy 4.1. Implement targeted, timely, quality assured IRS to achieve 95% coverage year-on-year using at least 2 insecticide classes guided by susceptibility profiles	Activity 4.1.1. Draft, cost, and monitor IRS micro/action plans at the district/sub-district level annually to ensure timely implementation of IRS campaign.	NMP, PMPs	CHAI, NICD, SAMRC	X	X	X	X	X
	Activity 4.1.2. Procure effective insecticides and other commodities for IRS by May of each year.	NMP, PMPs		X	X	X	X	X
	Activity 4.1.3. Implement and monitor IRS operations.	NMP, PMPs	NICD, SAMRC	X	X	X	X	X
	Activity 4.1.4. Conduct quality assurance for IRS stratified by insecticide class and house structure type	PMPs, districts	NICD/Wits, SAMRC	X	X	X	X	X
	Activity 4.1.5. Plan for effective community mobilisation and engagement in vector control response	NMP, PMP, Health Promotion, Communication	SAMRC, NICD, UP, WITS, UCT	X	X	X	X	X
Strategy 4.2. Implement ongoing entomological surveillance & response by 2019.	Activity 4.2.1. Establish national and provincial databases for vector surveillance	NMP, PMPs	NICD/Wits, SAMRC	X				
	Activity 4.2.2. Conduct monthly routine vector surveillance and annual insecticide susceptibility tests at sentinel sites.	NMP, PMPs, districts, sub-districts	NICD/Wits, SAMRC, UP	X	X	X	X	X
Strategy 4.3. In response to outbreaks, conduct site-directed vector surveillance and control.	Activity 4.3.1. Conduct site-directed vector surveillance and control	PMPs, districts	NICD/Wits, SAMRC, UP	X	X	X	X	X

Objective 4. Protect all populations at risk to achieve at least 95% coverage with key vector suppression strategies & interventions for the period 2019-2023

Strategy	Activity	Responsible Group(s)	Partners	2019	2020	2021	2022	2023
Strategy 4.4. Conduct ongoing operational research in collaboration with partner institutions.	Activity 4.4.1. Assess new vector control tools and products	NICD/Wits, SAMRC, UP	NMP, PMPs	X	X	X	X	X
	Activity 4.4.2. Assess the intensity and operational significance of insecticide resistance at selected sentinel sites in endemic provinces.	NICD/Wits, SAMRC, UP	NMP, PMPs	X	X	X	X	X
	Activity 4.4.3. Identify the entomological drivers of residual transmission in selected districts.	NICD/Wits, SAMRC, UP	NMP, PMPs	X	X	X	X	X

Objective 5. Ensure universal access to diagnosis and treatment in endemic and non-endemic areas according to national guidelines for the period 2019-2023

Strategy	Activity	Responsible Group(s)	Partners	2019	2020	2021	2022	2023
Strategy 5.1. Ensure universal access to quality malaria diagnosis by 2021	Activity 5.1.1. Ensure adequate supply and use of malaria rapid diagnostic tests in all facilities in both endemic and non-endemic zones	NDOH	Pharmacy Supply	X	X	X	X	X
	Activity 5.1.2. Regular training and mentoring of all individuals on malaria diagnosis by RDT and/or microscopy according to national guidelines	Provincial Malaria Programmes	NICD, UCT, CHAI	X	X	X	X	X
	Activity 5.1.3. Establish a collaboration with pharmaceutical procurement to ensure lot testing of all procured RDTs.	NDOH	Pharmacy Supply; NICD	X	X	X	X	X
	Activity 5.1.4. Conduct periodic post-test evaluation of used RDTs.	Provincial Malaria Programmes & NICD		X	X	X	X	X
Strategy 5.2. Ensure microscopy and RDTs are regularly assessed and improved	Activity 5.2.1. Designate, capacitate and activate a team to perform proficiency testing and EQA for all cadres involved in malaria diagnosis.	NICD, UCT	Provincial Malaria Programmes	X	X	X	X	X

Objective 5. Ensure universal access to diagnosis and treatment in endemic and non-endemic areas according to national guidelines for the period 2019-2023

Strategy	Activity	Responsible Group(s)	Partners	2019	2020	2021	2022	2023
Strategy 5.3. Ensure universal access to quality treatment for uncomplicated malaria by 2021	Activity 5.3.1. Ensure adequate supply and use of recommended, first-line treatments for uncomplicated malaria in all facilities in both endemic and non-endemic zones	NDOH	Pharmacy Supply	X	X	X	X	X
	Activity 5.3.2. Roll out primaquine single dose for clearance of gametocytes in appropriate endemic areas.	NDOH	NICD, UCT	X	X	X	X	X
	Activity 5.3.3. Regular training and mentoring of all individuals involved in malaria treatment on treatment according to national guidelines.	Provincial Malaria Programmes	NICD, UCT, NICD; CHAI	X	X	X	X	X
	Activity 5.3.4. Complete routine drug resistance monitoring of recommended, first-line treatments.	Provincial Malaria Programmes & NICD		X	X	X	X	X
	Activity 5.3.5. Routinely review, announce changes, and disseminate updated national treatment guidelines.	NDOH	NICD, UCT,	X	X	X	X	X
Strategy 5.4. Ensure universal access to quality treatment for severe malaria by 2021	Activity 5.4.1. Ensure adequate supply and use of recommended, first-line treatments for severe malaria in all facilities in both endemic and non-endemic areas	NDOH	Pharmacy Supply	X	X	X	X	X
	Activity 5.4.2. Regular training and mentoring of all individuals involved in treatment for severe malaria (e.g., hospital staff) on treatment according to national guidelines.	Provincial Malaria Programmes	NICD, UCT; SA SAMRC,; CHAI	X	X	X	X	X
	Activity 5.4.3. Conduct malaria mortality audits for every malaria death.	Provincial Malaria Programmes	NDOH	X	X	X	X	X

Objective 5. Ensure universal access to diagnosis and treatment in endemic and non-endemic areas according to national guidelines for the period 2019-2023								
Strategy	Activity	Responsible Group(s)	Partners	2019	2020	2021	2022	2023
Strategy 5.5. Administration of single low-dose primaquine to eligible population groups in line with national guidelines by 2020	Activity 5.5.1. Support advocacy for policy change to enable community health workers to test for malaria and treat uncomplicated or sub-clinical malaria within communities	NDOH	Provincial Malaria Programmes; CHAI	X				
	Activity 5.5.2. Regular training and mentoring of all community health workers on case management procedures according to national guidelines.	Provincial Malaria Programmes	NICD, UCT, SA SAMRC, CHAI		X	X	X	X
	Activity 5.5.3. Coordinate with Programme Management & Surveillance to ensure adequate supply, and appropriate transportation and storage of malaria commodities by community health workers	NDOH	Pharmacy Supply		X	X	X	X
	Activity 5.5.4. Conduct operational research to optimise case management by community health workers.	Provincial Malaria Programmes	NDOH, NICD, SAMRC, UCT, UP, CHAI	X	X	X	X	X
Strategy 5.6. Explore optimal delivery of malaria chemoprophylaxis for travellers to malaria endemic areas.	Activity 5.6.1. Conduct operational research to identify optimal populations, medications, and avenues to deliver malaria chemoprophylaxis.	NDOH	Provincial Malaria Programmes, NDOH, NICD, SAMRC, UCT, UP, CHAI	X	X	X	X	X
	Activity 5.6.2. Establish access points for chemoprophylaxis (e.g., travel clinics) in selected public health care facilities in both endemic and non-endemic zones.	Provincial Malaria Programmes	NDOH, NICD, SAMRC, UCT, UP, CHAI	X	X	X	X	X
	Activity 5.6.3. Regular training and mentoring of health care professionals at selected access points on basic health services and malaria chemoprophylaxis according to national guidelines.	Provincial Malaria Programmes	NICD, UCT, CHAI		X	X	X	X

ABBREVIATIONS: CDC – Communicable Disease Cluster; CHAI – Clinton Health Access Initiative; DHIS – District Health Information System; IOM – International Organization for Migration; SAMEC – South African Malaria Elimination Committee; NHLS – National Health Laboratory Service; NICD/Wits – National Institute for Communicable Diseases/University of the Witwatersrand; NMP – National Malaria Programme; PHC – Primary Health Care; PMP – Provincial Malaria Programme; SA MRC – South Africa Medical Research Council; SARN – Southern African Roll Back Malaria Network; UCT – University of Cape Town; UP – University of Pretoria; WHO – World Health Organization

5.2. Budget

5.2.1 Total Budget for Elimination

To move toward elimination, the malaria budget must increase substantially to incorporate the human resources, technology and other resources needed to effectively reduce transmission. Table 4 describes the total budget required to implement this strategic plan through 2023. To ensure sustainability of the elimination programme, resources should ideally come from the Department of Health of South Africa.

The total cost of this strategic plan is just over 2 billion Rands. Elimination costs were generated from a comprehensive financial expenditure and budgeting review undertaken in each of the malaria-affected provinces, including Limpopo, Mpumalanga, KwaZulu-Natal, Gauteng and North West. Based on this review, a financial gap was identified for each of these provinces, as well as for the National Malaria Programme based on this Strategic Plan and implementation plans for elimination.

5.2.2 Financial Resource Management

Funds for malaria are mobilised from Government at the national and provincial levels following fiscal year cycles from April to March. Given that malaria is a vertical programme within the National Department of Health, funds are allocated directly to the National and Provincial Malaria Programmes. All procurement except for drugs and rapid diagnostic tests is handled through the programmes. The Pharmaceutical units procure drugs and diagnostic kits but consult with the Malaria Directorate on recommended specifications for RDTs. Collaboration with the Pharmaceutical Directorate and the Provincial Heads of Pharmaceutical units is key to effective projection of supplies and follow-up on any potential stock-outs.

Once per year, audits on APP indicators are conducted and, as malaria is one of indicators in the APP, the malaria programme is also audited at all levels. Audits are conducted by both internal NDOH auditors and externally by the Auditor General.

Table 4. Total Budget by intervention area and objective for the three endemic provinces, by financial year.								
Thematic Area	Objective	Objective Description	FY 2019/2020	FY 2020/2021	FY 2021/2022	FY 2022/2023	FY 2023/2024	Totals by Category
Programme Management	1	Provide effective management, leadership and coordination for the optimal implementation of malaria elimination interventions at all levels by 2020	274 865 517	326 538 602	325 810 170	343 729 729	362 634 864	1 633 578 883
Surveillance	2	Strengthen and sustain the surveillance system so that 100% of malaria cases are reported into the MIS within 24 hours by 2020	4 652 759	3 362 247	3 435 868	3 448 704	3 679 264	18 578 841
Health Promotion	3	Ensure that 90% of the population affected by malaria receives information education communication (IEC) messaging by 2023.	7 856 115	5 962 190	9 396 285	5 711 939	9 356 985	38 283 515
Vector Control	4	Protect all populations at risk to achieve at least 95% coverage with key vector suppression strategies and interventions for the period 2019-2023.	81 759 239	107 493 537	70 390 605	66 163 658	68 847 277	394 654 316
Case Management	5	Ensure universal access to diagnosis and treatment, and roll out malaria chemoprophylaxis, in endemic and non-endemic areas according to national guidelines for the period 2019-2023	15 307 040	9 454 504	10 181 330	10 523 099	11 406 404	56 872 377
Other Costs			13 548 835	14 294 021	15 080 192	15 909 603	16 784 631	75 617 281
Total (all figures are in ZAR)			397 989 505	467 105 101	434 294 450	445 486 732	472 709 426	2 217 585 213





Malaria

A cure is the steps we take in the context of a condition. The term can refer specifically to a drug, surgery, or other medical condition, or more broadly to the state of being cured. The word is often used in the context of a person's health, as in "the cure for malaria" or "the cure for cancer".

Chapter 6: Monitoring and Evaluation

The Malaria Elimination Monitoring and Evaluation Plan (2019) describes all M&E processes, indicators and targets that will track South Africa's progress toward elimination (Table 5).

To monitor progress, data will be regularly collected, analysed, reviewed and used to inform programme management. In addition to routine data collection through the passive and active surveillance system, detailed and standardised provincial reporting will enable tracking of progress. A number of specific indicators have been chosen to demonstrate commitments from National and Provincial Malaria Programmes to the goal of malaria elimination.

Historically, data collection typically occurred at the facility level, where both a paper-based case notification and an electronic case notification (MalariaConnect/ NMC app) were generated. Before the end of 2019, these systems will be upgraded and streamlined into a new system upon DHIS2 infrastructure. This new system is designed to incorporate not only patient-level case reporting from facilities, as it had historically occurred on various provincial-level malaria information systems, but also adding active and reactive case detection data, foci/case investigation data, vector control data, and health promotion data, all into a single system. In this new National MIS, data flow will be simpler and cleaner, and allow for efficiency in integrating all data sources required to reach malaria elimination. Data collection and sharing within provinces and with the NDOH will be streamlined and standardised, enabling all parties to rapidly act through data-driven decisions (Figure 3).

Evaluation of the elimination targets is undertaken internally through national and provincial malaria programmes, as well as by SAMEC, the advisory committee consisting of experts in epidemiology, case management, vector control, surveillance, health promotion, programme management and other relevant areas. The 2019-2023 Strategic Plan will be reviewed at its midpoint in winter of 2021, following a malaria

programme review to assess progress against the targets set within the plan, as well as the efficacy and efficiency of its strategies and activities.

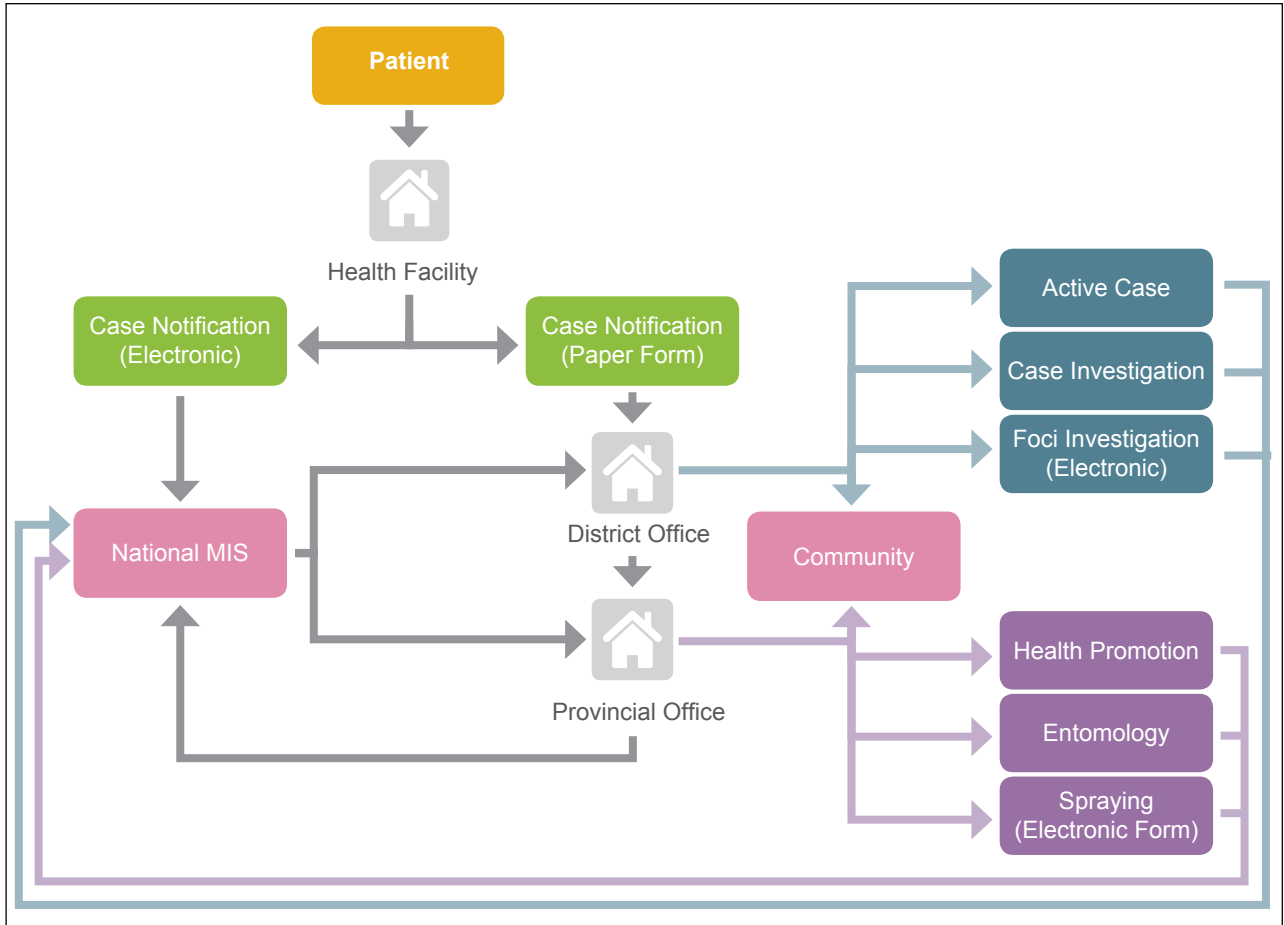


Figure 3: Proposed data flow for malaria at all levels and across systems utilising the new MIS based on DHIS2.

Table 5. Indicators for Monitoring and Evaluation, by Objective								
Item		Indicator	Data Source	Frequency of Reporting	Responsible Person	Operational Definitions	Explanatory Definition	Assumptions
Goal: To achieve zero local malaria transmission in South Africa by 2023	1	Number of local malaria cases	NMIS	Weekly / Monthly / Quarterly / Annually	National Malaria Manager, Provincial Malaria Managers	No calculation required	Local malaria case: Parasitologically-confirmed malaria case that is identified to be locally transmitted	a) Immediate detection of imported cases to prevent introduced cases b) 100% of the population has knowledge and practice of malaria prevention interventions
	2	Number of malaria deaths	NMIS	Weekly / Monthly / Quarterly / Annually	National Malaria Manager, Provincial Malaria Managers	No calculation required	Confirmed death: Death resulting from a primary malaria diagnosis at time of death	c) All transmission foci are cleared
	3	Local malaria cases per 1000 population at risk	NMIS	Monthly / Quarterly / Annually	National Malaria Manager, Provincial Malaria Managers	(n) Number of confirmed local malaria cases (d) Total population at risk	Local malaria case: Parasitologically-confirmed malaria case that is identified to have been locally transmitted Population at risk: Individuals who live in malaria-endemic areas in KwaZulu-Natal, Limpopo, and Mpumalanga	d) A survey will be conducted to re-evaluate current population at risk (estimated at 10% of the total population) e) As national incidence declines to the point where all districts are in the pre-elimination or elimination phase, incidence rate (3) will be less relevant and absolute numbers of confirmed cases will be monitored instead (1).
	4	Number of districts and sub-districts with zero local malaria cases	NMIS	Monthly / Quarterly / Annually	National Malaria Manager, Provincial Malaria Managers	No calculation required	Local malaria case: Parasitologically-confirmed malaria case that is identified to have been locally transmitted	RDTs are working and accurate information is provided by the infected person/s

Table 5. Indicators for Monitoring and Evaluation, by Objective								
Item		Indicator	Data Source	Frequency of Reporting	Responsible Person	Operational Definitions	Explanatory Definition	Assumptions
Objective 1. Provide effective management, leadership and coordination for the optimal implementation of malaria elimination interventions at all levels by 2020	1.1	Proportion of budgeted funds released (from total required)		Quarterly / Annually	National Malaria Manager, Provincial Malaria Managers	(n) Budgeted funds released (d) Total funds required	Effective leadership and Management: Programme aligned to WHO GTS and accordingly monitored with the requisite budgets	Appropriately skilled staff in place to drive and manage programme implementation.
	1.2	Proportion of funds spent from those released		Annually		(n) Funds spent (d) Total funds released	Funds: Malaria funding both from donor and equitable share	Enabling environment in place to effective expenditure; e.g. SCM, HR and finances
	1.3	Number of top 10 registered corporations that invest in malaria		Monthly / Quarterly / Annually	National Malaria Manager, Provincial Malaria Managers	No calculation required	Corporations: private sector funding partners	Sound business plan in place and advocacy strategy
	1.4	Proportion of vacant positions filled		Annually	National Malaria Manager, Provincial Malaria Managers	(n) Number of vacant positions filled (d) Total number vacant positions	Vacant posts: government funded posts that are not occupied	Support from HR is secured to ensure positions are filled
	1.5	Proportion of health sector workplans which contain malaria elimination		Annually	National Malaria Manager, Provincial Malaria Managers	(n) Number of health sector workplans which contain malaria elimination (d) Total number of health sector workplans	Health sector workplans: All Government Departments and key stakeholders including malaria in the workplans	Buy-in from multiple stakeholders

Table 5. Indicators for Monitoring and Evaluation, by Objective								
Item		Indicator	Data Source	Frequency of Reporting	Responsible Person	Operational Definitions	Explanatory Definition	Assumptions
	1.6	Number of functional operational cross-border committees with annual malaria elimination plans		Quarterly / Annually	National Malaria Manager, Provincial Malaria Managers	No calculation required	Cross-border committees: operational level committees at the district level that interact with each other on malaria related issues	MOU in place for cross-border committees to be established
	1.7	Proportion of priority research issues addressed		Annually	National Malaria Manager, Provincial Malaria Managers	(n) Number of priority research issues addressed (d) Total number research issues	Research Issues: Operational research to inform malaria policy and strategies	Capacity exist among research partners to undertake the relevant research
Objective 2. Strengthen and sustain the surveillance system so that 100% of malaria cases are reported into the MIS within 24 hours by 2020	2.1	Proportion of facilities reporting weekly, including zero reporting	DHIS	Weekly	Provincial Malaria Managers/ CDC Coordinators	(n) Number of public and private facilities reporting on malaria indicators each week (d) Total number of public and private facilities	Public health facility: Government-funded health facilities Private health facility: Privately-funded health facility	The national level is able to track reporting from lower levels to national 2. A national information system is in place 3. All provinces use the national system to standardise reporting 4. All 52 districts report weekly

Table 5. Indicators for Monitoring and Evaluation, by Objective								
Item		Indicator	Data Source	Frequency of Reporting	Responsible Person	Operational Definitions	Explanatory Definition	Assumptions
								<p>5. Capacity for GIS mapping is in place at the district, provincial and national levels</p> <p>6. Definitions and processes for collecting and monitoring these indicators will be aligned to the National Surveillance Guidelines for Malaria Elimination</p> <p>7. Determination of case classification (local or imported) can be derived from passive and/ or active case detection</p>
	2.2	Annual blood examination rate per district (RDT/ Microscopy)	DHIS2	Monthly	Provincial Malaria Managers	<p>(n) Total number of blood smears collected /RDTs</p> <p>(d) Total population covered during surveillance</p>	<p>Annual blood examination rate:</p> <p>An index of operational efficacy of the programme.</p>	Capacity and funding exists for undertaking blood examination at the field level.
	2.3	Proportion of confirmed cases that have been correctly classified	MIS	Monthly	Provincial Malaria Managers	<p>(n) Number of confirmed cases that have been correctly classified</p> <p>(d) Total number of confirmed malaria cases</p>	Confirmed case: Parasitologically diagnosed with RDT and/ or microscopy and correctly classified (local or imported)	Financial and HR capacity in place to conduct case investigation for case classifications

Table 5. Indicators for Monitoring and Evaluation, by Objective

Item	Indicator	Data Source	Frequency of Reporting	Responsible Person	Operational Definitions	Explanatory Definition	Assumptions
2.4	Proportion of active malaria transmission foci cleared	DHIS2	Annually	Provincial Malaria Managers	(n) Number of active malaria transmission foci cleared (d) Total number of active malaria transmission foci	Focus: A defined and circumscribed locality situation in a currently or former malaria endemic area and containing the continuous or intermittent epidemiological factors necessary for malaria transmission	Cooperation from partners and communities to undertake foci clearing at the sub district level.
2.5	Proportion of foci investigated and classified within 72 hours	DHIS2	Monthly	Provincial Malaria Managers	(n) Number of foci investigated and classified within 72 hours (d) Total number of malaria transmission foci		
2.6	Proportion of confirmed outbreaks responded to within 72 hours	MIS	Monthly	Provincial Malaria Managers	(n) Number of health facility-level, district and provincial-level outbreaks that are responded to within 72 hours of identification (d) Total number of health facility-level, district and provincial-level outbreaks	Outbreak: Occurrence of cases of disease in excess of what would normally be expected in a defined community, geographical area, or season	Funding is available to undertake relevant responses for foci clearing and collaboration with relevant stakeholders

Table 5. Indicators for Monitoring and Evaluation, by Objective								
Item		Indicator	Data Source	Frequency of Reporting	Responsible Person	Operational Definitions	Explanatory Definition	Assumptions
	2.7	Ratio of index cases to secondary detected cases	NMIS, DHIS	Weekly	Provincial Malaria Managers/ CDC Coordinators	(n) Number of secondary cases (d) Index case	Index case: the first identified case in an outbreak	1. The national level is able to track reporting from lower levels to national
	2.8	Proportion provinces submitting monthly and quarterly progress reports	NMIS	Monthly / Quarterly / Annually	Provincial Malaria Managers	(n) Number of public and private facilities reporting on malaria indicators each week (d) Total number of public and private facilities	Public health facility: Government-funded health facilities Private health facility: Privately-funded health facility	2. A national information system is in place 3. All provinces use the national system to standardise reporting 4. All 52 districts report weekly
	2.9	Percentage confirmed malaria cases notified within 24 hours of diagnosis	MIS	Health facility to district and province in 24hrs; provincial reports weekly to national	Provincial Malaria Managers/ CDC Coordinators	(n) Number of confirmed malaria cases notified within 24 hours of diagnosis (d) Total number of malaria cases notified	Confirmed case: Case that is parasitologically confirmed as malaria by RDT and/or microscopy	5. Capacity for GIS mapping is in place at the district, provincial and national levels 6. Definitions and processes for collecting and monitoring these indicators will be aligned to the National Surveillance Guidelines for Malaria Elimination

Table 5. Indicators for Monitoring and Evaluation, by Objective

Item	Indicator	Data Source	Frequency of Reporting	Responsible Person	Operational Definitions	Explanatory Definition	Assumptions
2.10	Proportion malaria cases, stratified by source of infection (local or imported)	MIS, DHIS	Health facility to district and province in 24hrs; provincial reports weekly to national	Provincial Malaria Managers/ CDC Coordinators	(n) Number of confirmed malaria cases that are identified as local/imported (d) Total number of confirmed malaria cases	Local case: Malaria case for whom infection originated within South Africa Imported case: Malaria case for whom infection originated outside South Africa, as determined by travel history	7. Determination of case classification (local or imported) can be derived from passive and/ or active case detection
2.11	Proportion notified malaria cases investigated within 48 hours or 7 days of notification	NMIS, MIS	Weekly from District to province; Province reports monthly to National	Provincial Malaria Managers	(n) Number of confirmed malaria cases that are investigated within 48 hours or 7 days of notification (d) Total number of confirmed malaria cases	Fully investigated: An investigation following the case investigation protocol defined by each province and the National Surveillance Guidelines for Malaria Elimination for South Africa	
2.12	Proportion positive cases identified through active case detection	MIS	24 hours	Provincial Malaria Managers	(n) Number of positive cases identified through active case detection (d) Total number of positive cases identified by both passive and active case	Active case detection: Active search for additional malaria infections in the community Passive case detection: Detection and reporting of malaria cases from the health facility	

Table 5. Indicators for Monitoring and Evaluation, by Objective								
Item		Indicator	Data Source	Frequency of Reporting	Responsible Person	Operational Definitions	Explanatory Definition	Assumptions
	2.13	Proportion confirmed malaria cases mapped per district	MIS	Weekly	Provincial Malaria Managers	(n) Number of confirmed malaria cases mapped per district (d) Total number of confirmed malaria cases per district	Mapped: GPS coordinate of case's residence captured by surveillance officers and mapped using a geographical information system (GIS) as part of the PMIS	
Objective 3. Ensure that 90% of the population affected by malaria receives information education communication (IEC) messaging by 2023.	3.1	Proportion of population reached through malaria IEC on malaria prevention and early health-seeking behaviour interventions	NMIS, MIS, DHIS	Annually	Provincial Malaria Managers	(n) Number of people reached through IEC on malaria prevention and early health-seeking behaviour interventions (d) Targeted population	IEC: Information Education and Communication. Health promotion messaging to target malaria affected population on behaviour modification	Financial resources are in place to undertake IEC campaigns.
	3.2	Number of targeted sessions with decision makers		Annually	Provincial Malaria Managers	No calculation required	Decision makers: They include traditional leaders, politicians	Willingness of decision makers to engage with malaria officials
	3.3	Number of community and social mobilisation engagements conducted		Annually	Provincial Malaria Managers	No calculation required	Community Social mobilisation engagement: Meetings with communities to share malaria IEC	Permission obtained from village leaders in the community
	3.4	Number of HP activities conducted during outbreaks		Annually	Provincial Malaria Managers	No calculation required	Health promotion activities: malaria messaging using appropriate media; e.g. radio, print, dialoguing and pamphlet distribution	Support obtained from the District Outbreak Response units.

Table 5. Indicators for Monitoring and Evaluation, by Objective								
Item		Indicator	Data Source	Frequency of Reporting	Responsible Person	Operational Definitions	Explanatory Definition	Assumptions
	3.5	Number of endemic provinces that conducted KAP studies		Annually	Provincial Malaria Managers	No calculation required	KAP = knowledge, attitude and practices studies	Funding available to undertake KAP studies.
Objective 4. Protect all populations at risk to achieve at least 95% coverage with key vector suppression strategies and interventions for the period 2019-2023.	4.1	Proportion of targeted population at risk protected by IRS	NMIS, MIS, DHIS	Annually	Provincial Malaria Managers, Provincial Entomologists / VC	(n) Number of people protected by IRS (d) Total population at risk	Population at risk: The total population living in malaria endemic areas with ongoing local transmission	
	4.2	Proportion of population covered by IRS in targeted transmission foci	MIS	Annually	Provincial Malaria Managers	(n) Number of people protected by IRS in targeted transmission foci (d) Total population in targeted transmission foci		
	4.3	Proportion of districts/ sub-districts submitting electronic entomological surveillance reports	NMIS, MIS, DHIS	Weekly / Monthly	Provincial Malaria Managers, Provincial Entomologists/VC	(n) Number of provinces submitting electronic entomological surveillance reports (d) Total number of provinces required to submit electronic entomological surveillance reports	Progress reports: Reports on progress made	

Table 5. Indicators for Monitoring and Evaluation, by Objective								
Item		Indicator	Data Source	Frequency of Reporting	Responsible Person	Operational Definitions	Explanatory Definition	Assumptions
	4.4	Number of entomological assessments conducted during out-breaks	NMIS, MIS, DHIS	Annually	Provincial Malaria Managers, Provincial Entomologists/VC	No calculation required		
Objective 5. Ensure universal access to diagnosis and treatment in endemic and non-endemic areas according to national guidelines for the period 2019-2023	5.1	Proportion of malaria cases confirmed by RDT or microscopy	NMIS, MIS, Facility Logs	Weekly	Provincial Malaria Managers, Facilities; CDC	(n1) Number of malaria cases confirmed by RDT (n2) Number of malaria cases confirmed by microscopy (d) Total number of confirmed malaria cases		
	5.2	Proportion of confirmed, uncomplicated or asymptomatic malaria cases treated with recommended, first-line treatments	NMIS, MIS, Facility Logs	Weekly	Provincial Malaria Managers, Facilities; CDC	(n) Number of confirmed uncomplicated or asymptomatic cases treated with first-line treatments (f) Total number of confirmed uncomplicated & asymptomatic malaria cases		

Table 5. Indicators for Monitoring and Evaluation, by Objective								
Item		Indicator	Data Source	Frequency of Reporting	Responsible Person	Operational Definitions	Explanatory Definition	Assumptions
	5.3	Proportion of confirmed severe malaria cases treated with recommended first-line treatments	NMIS, MIS, Facility Logs	Weekly	Provincial Malaria Managers, Facilities	(n) Number of confirmed severe malaria cases treated with first-line treatments (d) Total number of confirmed severe malaria cases		
	5.4	Proportion of malaria deaths with complete malaria mortality audit report	NMIS, MIS, Facility Logsw	Monthly	Provincial Malaria Managers, Facilities; CDC	(n) Number of malaria deaths with complete malaria mortality audit report (d) Total number of malaria deaths		
	5.5	Proportion of endemic targeted sub-districts implementing test and treat at the household level	NMIS, MIS, CHW Training Records	Quarterly	Provincial Malaria Managers; CDC	(n) Number of endemic targeted sub-districts implementing test and treat at the household level (d) Total number of endemic sub-districts targeted for test and treat at the household level		
	5.6	Proportion of health facilities reporting no stock outs (RDTs and antimalarials)	NMIS, MIS	Quarterly	Provincial Malaria Managers; CDC	(n) Total number of health facilities reporting no stock outs (RDTs and antimalarials) (d) Total number of health facilities		





Chapter 7: Conclusion

South Africa's multifaceted Malaria Elimination Strategic Plan, which is informed by international and local expertise as well as existing evidence-based research, provides a rigorous roadmap for malaria elimination in South Africa. At the national level, the strategic plan will be used by the national malaria programme to identify key programmatic and financial gaps and review, monitor and evaluate programmatic success and progress toward the elimination goal. Provincial malaria programmes will use the strategic plan to guide implementation for elimination. The strategic plan may also be used to identify areas of support required from government and partners.

The malaria elimination strategic plan is not a static document. As understanding of malaria elimination and South Africa's unique epidemiological environment evolves through research and evaluation, the elimination strategy will be revised accordingly. South Africa's elimination success depends on using adaptive and innovative approaches to implement high-impact interventions.

Annexure 1: Malaria Directorate Organogram

Figure 1. Structure of the National Vector Borne Diseases Control Programme

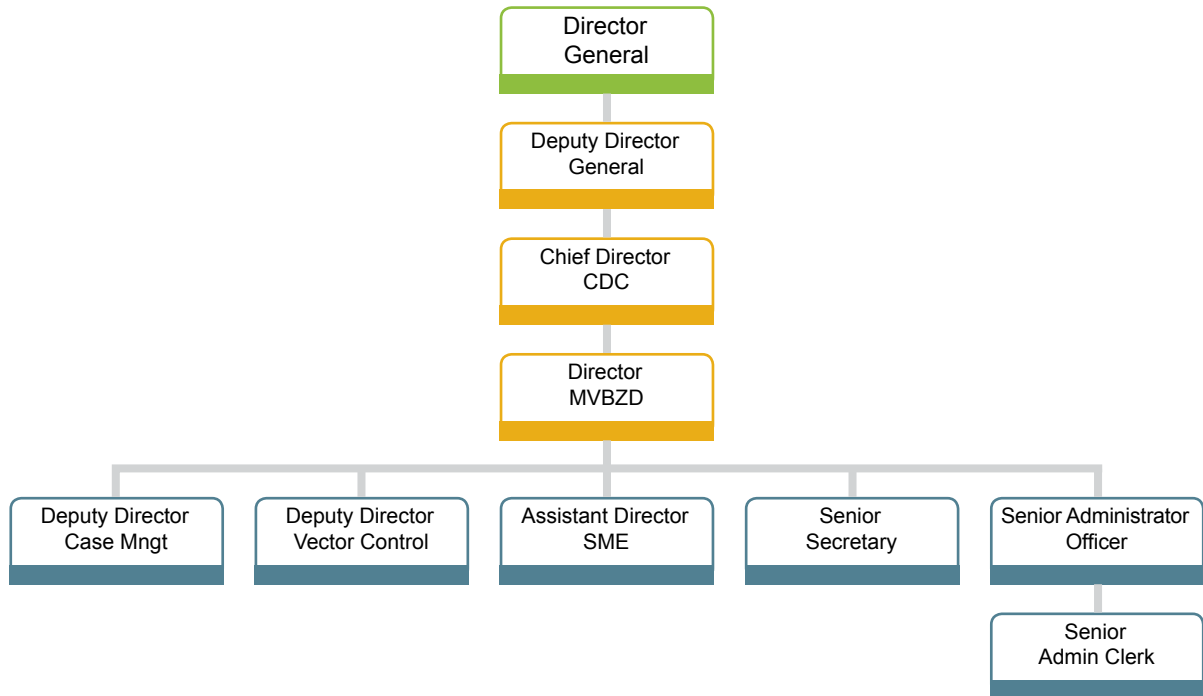


Figure 2. Malaria Programme Structure at the Provincial Level



Annexure 2: Municipality-level Overall Incidence Rates, 2018

		Municipality Incidence Rates							
		Medium		Low		Very Low			
		<i>Greater than 1 per 1,000 population at risk</i>		<i>Between 1 and 0.1 per 1,000 population at risk</i>		<i>Less than 0.1 per 1,000 population at risk</i>			
Province	Municipality	Municipality	Rate	Municipality	Rate	Municipality	Rate		
Limpopo	Capricorn			Blouberg	0.40	Lepele-Nkumpi	0.81		
				Polokwane	0.05	Elias Motsoaledi	0.02		
	Greater Sekhukhune			Makhuduthamaga	0.02	Fetakgomo	0.12	Molemole	0.01
				Mopani	Musina			10.11	
	Greater Letaba			7.61					
	Thulamela			4.54					
	Greater Giyani			4.71					
	Collins Chabane			2.89					
	Vhembe			Ba-Phalaborwa	2.70				
				Makhado	1.63				
				Maruleng	1.27				
	Waterburg			Greater Tzaneen	1.11				
				Lephalale	5.56			Mogalakwena	0.06
								Mookgopong	0.02
					Bela-Bela	0.01			
Mpumalanga	Ehlanzeni	Bushbuckridge	1.54	Nkomazi	0.44				
				Mbombela	0.34				
				Thaba Chweu	0.16				
KwaZulu-Natal	Umkhanyakude			Jozini	0.53	Nongoma	0.005		
				Umlabuyalingana	0.23	Abaqulusi	0.004		
				uPhongolo	0.11	The Big 5 Hlabisa	0		
	Uthungulu Zululand					Mtubatuba	0		
						Mfolozi	0		
						Ulundi	0		

Annexure 3: Key Term Definitions

Case detection, active: Process of case-finding by visiting at monthly intervals all houses in a designated area and taking blood specimens to detect additional malaria infections in the community.

Case detection, passive: Detection of malaria cases among patients who on their own initiative went to a health post to get treatment, usually for a febrile disease.

Case, imported: A case, the origin of which can be traced to a known malarious area outside the country in which the case was diagnosed.

Case, locally transmitted: A case, the origin of which from local transmission cannot be disproved. It includes delayed first attacks of *P. vivax* due to locally acquired parasites with a long incubation period.

Case, induced: A case, the origin of which can be traced to a blood transfusion or other form of parenteral inoculation, but not to normal transmission by a mosquito.

Case, introduced: A case in which it can be proved that the infection is a first step (first generation) of local transmission subsequent to a proved imported case, i.e. in which the mosquito was infected from an imported case.

Case investigation: Gathering enough information to allow classification of a malaria case by origin of infection. It includes, but is not limited to, administration of a standardised questionnaire to a person diagnosed with a malaria infection.

Case, malaria (as defined in elimination programmes): A person in whom, regardless of the presence or absence of clinical symptoms, malaria parasites have been confirmed by quality-controlled laboratory diagnosis.

Case notification (compulsory): Reporting of detected cases of malaria by all medical units and medical practitioners (public and private) to the Health Department.

Endemic: Applied to malaria when there is a constant measurable incidence of cases and mosquito-borne transmission in an area over a succession of years.

Epidemic: Occurrence of cases in excess of the number expected in a given place and time period.

Focus: A defined and circumscribed locality situated in a currently or former malarious area and containing the continuous or intermittent epidemiological factors necessary for malaria transmission. Foci can be classified as residual active, residual non-active, cleared up, new potential, new active, endemic or pseudo-foci.

Gametocytes, person carrying: Person who has malaria gametocytes in the peripheral blood, making him or her potential source of infection.

Geographical reconnaissance: The operation that provides the basis for the choice of field centres and depots, for detailed schedules and itineraries of spraying and surveillance personnel, for the final deployment of transport, and for the numerical control of the completeness of the work accomplished or reported. It includes collection of information on the number, type, location and means of access to all houses and field shelters, as well as on communications, health units, vehicle repair facilities, population movements and other relevant factors.

Incubation period: The time between infection (by inoculation or otherwise) and the first appearance of clinical signs, of which fever is the most common.

Intensity of transmission: Rate at which people in a given area are inoculated with malaria parasites by mosquitoes (usually expressed by the annual entomological inoculation rate).

Malaria elimination: A reduction to zero of the incidence of infection caused by human malaria parasites in a defined geographical area as a result of deliberate efforts. Continued measures to prevent re-establishment of transmission are required.

Malaria-free: An area where there is no continuing local mosquito-borne malaria transmission and the risk of acquiring malaria is limited to introduced cases only.

Malaria incidence: The number of newly diagnosed malaria cases during a specified time period in a specified population.

National foci register: Centralised computerised database of all malaria foci in a country.

National malaria case register: Centralised computerised database of all malaria cases registered in a country, irrespective of where and how they were diagnosed and treated. It allows detailed analysis and synthesis of epidemiological information and trends, to guide the malaria elimination programme.

Parasite strain: Sub-type of parasites with similar properties. Properties that are strain-specific include immune response in the human host, infectiousness for a given species of vectors and anti-malarial drug resistance.

Population at risk: Population living in a geographical area where locally-acquired malaria cases occurred in the current and/or previous year. The measurement unit for elimination milestones among populations at risk is a political unit corresponding to approximately 75 000–150 000 people (e.g. a district).

Receptivity: The abundant presence of anopheline vectors and the existence of other ecological and climatic factors favouring malaria transmission.

Re-establishment of transmission: Renewed presence of a constant measurable incidence of cases and mosquito-borne transmission in an area over a succession of years. An indication of the possible re-establishment of transmission would be the occurrence of three or more introduced and/or locally transmitted malaria infections in the same geographical focus, for two consecutive years for *P. falciparum* and for three consecutive years for *P. vivax*.

Relapse: Renewed manifestation (of clinical symptoms and/or parasitaemia) of malaria infection separated from previous manifestations of the same infection by an interval greater than that related to the normal periodicity of the paroxysms. The term is used mainly for renewed manifestation due to the survival of hypnozoites (exo-erythrocytic forms) of *P. vivax* or *P. ovale*.

Sensitivity (of a test): The proportion of true positives among all the positives it detects.

Surveillance: The component of the malaria programme aimed at the discovery, investigation and elimination of continuing transmission, the prevention and cure of infections, and the final substantiation of claimed elimination.

Vigilance: A function of the public health service during the programme for prevention of re-introduction of transmission, consisting of watchfulness for any occurrence of malaria in an area in which it had not existed or from which it had been eliminated, and the application of necessary measures against it.

Vulnerability: Either proximity to malarious areas or resulting from the frequent influx of infected individuals or groups and/or infective anophelines.

CONTRIBUTORS:



**NATIONAL INSTITUTE FOR
COMMUNICABLE DISEASES**

Division of the National Health Laboratory Service



**World Health
Organization**



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