Solomon Islands

Strategic Plan for Malaria Control and Elimination

2021-2025

National Vectorborne Disease Control Programme

Ministry of Health and Medical Services

June 2020

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EXECUTIVE SUMMARY

Since 1992, the Solomon Islands has made great progress in reducing the burden of malaria. Intensive malaria control strategies and technical support in the mid-990s, including the widespread availability of insecticide treated bed nets and a resumption of targeted IRS had a major impact on malaria transmission. These interventions continued throughout the 1990s and into the first decade of the 2000s. Cases continued to decline (except for the period 1998-2004, when many aspects of health service delivery were disrupted by the ethnic tensions that mainly affected Guadalcanal and Malaita Provinces).

Global Fund support started in 2003-04 and from 2011-2015 the Country received extensive Australian aid support. The combination of financial support resulted in a decrease in the Annual Parasite Incidence (API) from over 200 per thousand in 2003 to just below 30 per 1,000 in 2014. Since 2015, the API has increased reaching 107 in 2019.

The burden of malaria is variable in the Solomon Islands. Four provinces contributed approximately 86% of the malaria burden in the Country in 2019: Central Islands (10.5%), Guadalcanal (27.1%), Honiara (15.2%), and Malaita (33.1%). The malaria caseloads, in the other six provinces (Choiseul 0.7%, Isabel 0.5%, Makira 4.2%, Rennell-Bellona 0%, Temotu 2.5%, and Western 6.0%) attributed to the overall national malaria burden were marginal (14%).

API has been increasing rapidly in Central Islands Province, which in 2019 was the highest in the Country at 380.1 per 1,000 followed by Malaita with an estimated API of 127.1 and a group of three other provinces with very similar transmission risk (Temotu, Honiara and Guadalcanal), each with an API around 80 per 1,000.

That resurgence has derailed what before 2015 was a path to malaria elimination by 2030. That is no longer realistic, so during the period covered by this Strategic Plan, the priority will be to make the investments necessary to turn the Programme around, to return to the pre-2015 API levels and continue from there to zero cases by 2034.

This Plan envisions four steps to that goal:

1. By the end of 2021, elimination-ready surveillance will be fully developed and operational in all low burden provinces and then expanded in phases to cover all provinces by 2025.

2. By 2025 the national API will be reduced to pre-2015 levels of 30 per thousand, and at least two provinces will have reached zero indigenous cases.

3. After the end of 2030, there will be zero indigenous cases of malaria.

4. By the end of 2034, the Country will be certified malaria-free.

A preliminary malaria elimination plan has been developed that lays out the basic components of the long-term elimination strategy. The Plan needs to be fully developed, but during the period

of this grant, the basic elements for elimination will be put in place through significant investments in four key components: vector control, case management, surveillance and response, and behaviour change communications that will be combined with critical investments to strengthen the enabling environment.

Vector control will consist of three-yearly mass distributions of LLINs to achieve universal coverage and higher levels of net usage together with a continuous distribution of LLIN to maintain universal coverage. In addition, high-quality IRS with non-pyrethroid insecticide will be used to rapidly reduce incidence in outbreak areas.

Case management will focus on maintaining high quality assured diagnosis by RDT or microscopy. RDTs will be available at all health facilities while quality microscopy will continue to be available at health centres and hospitals to support patient management and later, during elimination to validate any low-density parasitemias.

National Malaria Treatment Guidelines were updated in 2017. There is no evidence of reduced effectiveness of any of the currently used treatment regimens. Stockouts of drugs and other supplies occur, but the frequency has been greatly reduced due to the introduction of the mSupply system.

Treatment of *P. vivax* with primaquine even though it is in the Treatment Guidelines continues to be below the level needed to decrease reported cases. This situation will improve with the rollout of G6PD point-ofcare testing within the period of the proposed grant.

Creation of an elimination-ready case-based surveillance system will be a key component of the malaria elimination plan. Operational research will develop the necessary protocols and provide training to staff at all levels so that as provinces reach low enough levels of transmission, they can begin to do routine case investigations, take appropriate remedial measures, and do the necessary follow-up in line with the 2-4-7 model. Cases will be reported within two days, investigated within four days and appropriate remedial measure taken with a week.

The malaria surveillance system will be integrated into and support the further development of the general health information system that uses an expanded DHIS2 platform. This plan includes investments in upgrading the DHIS2 system and increasing the rate of reporting by improving communications with the more remote health facilities that lack an internet connection.

Entomological surveillance will focus on monitoring vector behaviour and insecticide resistance.

This Plan supports the implementation of an effective behaviour change communication strategy that will focus on improving the regular use of LLINs, acceptance of IRS in the targeted outbreak areas and promoting a higher level of treatment seeking behaviour that will be important when someone in the household has a fever. It includes plans to combine inputs from the health promotion unit of the MHMS together with targeted community interventions that will cement behaviours compatible with elimination.

The VBDCP has been part of the reorganisation of the MHMS that started in 2015; it aims to finalise the change from a vertical to a programme that is fully integrated into the health system. The change process has taken responsibility away from the national level and placed it on provinces to manage resources and implement strategies. However, there is still confusion about what the provinces need to do and how to do it. This plan recognises the need to strengthen both the provincial and health zone levels by providing some basic managerial and technical training as well as some specific financial management support that will bring those two levels of the health system up to what is needed to support malaria elimination. It includes harmonised planning, improved financial management, and increased supervision.

The total budget for this NSP is $**12,376,370**. The following table breaks it down by objective.

Summary of NSP Budget by Objective (USD)

NSP Objectives	y1	y2	y3	y4	y5	5 Yr Total	3 yr Total
Vector Control	1,020,899	925,186	933,891	1,033,685	268,437	4,182,099	2,879,977
Surveillance and Monitoring	706,000	755,000	772,500	705,000	692,000	3,632,009	2,233,500
Operational Research	347,200	80,133	101,007	157,151	102,309	787,800	528,341
Enabling Environment	1,443,918	-	-	-	-	1,443,918	1,443,918
Case Management (NSP)	910,895	884,169	959,929	820,049	659,990	4,235,032	2,754,993
BCC/IEC	1,614,048	456,357	465,236	1,804,123	504,436	4,844,201	2,535,641
Grand Total	**6,042,961**	**3,100,846**	**3,232,563**	**4,520,008**	**2,227,173**	**19,125,060**	**12,376,370**

Global Fund financing will continue to be on a payment for services (a.k.a. cash on delivery) basis, but the role of co-funding is not clear. The Solomon Islands Government has not come up with additional funding for the NVBDCP, and the amount of funds that will come from the two main partners (UNDP and WHO) has not been confirmed.

The Global Fund regular allocation to support the first three years of the NSP is USD$8,031,136. After a long period of consultation between stakeholders the Solomon Islands request based on the priorities in the NSP totals USD$12,376,370 made up of USD$8,132,936 from the regular allocation and US$1,173,434 from MEMTI. There is no PAAR request.

The MEMTI request includes a set of activities to propel the NVBDC towards elimination including the following.

1. Defining an elimination-ready surveillance system that will be part of and, at the same time, strengthen the overall health information system. It will initially involve six low burden health zones. We have chosen to make this an operational research activity that includes a TA, training, system design for the DHIS2, and development of SOPs.

2. Building up critical infrastructure that will strengthen malaria elimination and other health activities at the health zone level. This includes refurbishing or building houses for staff, constructing sheds, and providing reliable transportation so that malaria

operations, as well as outreach by other programmes, can take place in a timely, efficient manner.

3. Improving communications at health facilities that do not have internet connections by providing high-frequency radios. This will allow timely reporting and real-time support for treatment.

4. Solving some of the significant financial management problems at the provincial level that have, for a long time handicapped malaria field operations as well as other programmes by posting expatriate consultants to three provinces. There has been significant improvement in getting funds from the central level out to provinces, but the provincial managers have not been doing a good job using the funds as intended. This will be a cross-cutting intervention that was developed by DFAT to link with its broader support to provinces but was never funded. The total cost for three consultants for three years is slightly more than $2 million so we are proposing cofunding 50:50 with DFAT.

Summary of Global Fund Request by Module and Allocation

	MEMTI	Regular Allocation
Case classification	528,341	
Case management		2,774,993
RSSH governance and planning	75,000	
RSSH Management info and ME		352,000
RSSH: Financial management systems	1,665,000	
RSSH: Health Products Management systems	616,931	
RSSH: Integrated service delivery and quality improvement	826,988	
Vector control	461,175	4,965,943
RSSH Laboratory Systems		40,000
Grand Total	4,173,435	8,132,936

ACRONYMS AND ABBREVIATIONS

ABER	Annual blood examination rate
ACSM	Advocacy, communication and social mobilisation
ACT	Artemisinin-based combination therapy
ACTMalaria	Asian Collaborative Training Network for Malaria
AFI	Annual P falciparum incidence rate
AHC	Area Health Centre
An	Anopheles
AOP	Annual Operational Plan
API	Annual parasite incidence
APLMA	Asia-Pacific Leaders Malaria Alliance
APMEN	Asia Pacific Malaria Elimination Network
ARI	Acute respiratory infection
AVI	Annual P vivax incidence rate
CHC	Community Health Centres
CHE	Current health expenditure
CIP	Central Islands Province
COD	Cash on delivery (performance-based financing system)
CRVS	Civil Registration and Vital Statistics (system)
DHIS-2	District Health Information System (version 2)
DHS	Demographic and Health Survey (2015)
DP	Development partner
EQA	External quality assurance
G6PD	Glucose-6-phosphate dehydrogenase
GDP	Gross domestic product
GPPOL	Guadalcanal Province Palm Oil Limited
GTS	WHO Global Technical Strategy for Malaria 2016–2030
HCC	Honiara City Council
HIS	Health information system
HIU	Health Information Unit (MHMS)
HPU	Health Promotion Unit
HRP	Histidine-rich protein
HSSP	Health Sector Support Program
iCCM	Integrated community case management
IEC	Information, education and communication
IRS	Indoor residual spraying (with insecticide)
ITN	Conventional insecticide-treated bed net
JCU	James Cook University
LLIN	Long-lasting insecticide treated bed nets
LSM	Larval source management
M&E	Monitoring and evaluation
MCMR	Malaria Case Management Record

MDG	Millennium Development Goal
MEMTI	Malaria Elimination in Melanesia and Timor-Leste Initiative
MHMS	Ministry of Health and Medical Services
MIS	Malaria Indicator Survey of (2011)
MLR	Malaria Laboratory Register
MPR	Malaria Programme Review
NAC	National Advisory Committee (for Malaria Elimination)
NAP	Nurse Aide Posts
NCD	Non-communicable disease
NHSP	National Health Strategic Plan
NMS	National Medical Store
NRH	National Referral Hospital
NSO	National Statistics Office
NVBDCP	National Vector Borne Disease Control Program
OOP	Out-of-pocket (expenditure)
OPD	Outpatient department
OPM	Office of the Prime Minister
Pf	Plasmodium falciparum
PFM	Public financial management
PHD	Provincial Health Director
PHESU	Public Health Emergency and Surveillance Unit
PHO	Provincial Health Office
PIC	Pacific Island country
PMC	Provincial Malaria Coordinator
PNG	Papua New Guinea
POC	Point-of-care (e.g. testing)
PQ	Primaquine
PR	Principal Recipient (Global Fund)
PSM	Procurement and supply management
Pv	Plasmodium vivax
QA	Quality assurance
RAM	Rotarians Against Malaria
RAMSI	Regional Assistance Mission to the Solomon Islands
RDP	Role Delineation Policy
RDT	Rapid diagnostic test
RHC	Rural Health Centre
SBCC	Social and behaviour change communication
SBD	Solomon Islands dollar
SDG	Sustainable Development Goal
SIG	Solomon Islands Government
SINU	Solomon Islands National University
SLMS	Second level medical store
SMS	Short message service
SOP	Standard operating procedure

STG	Standard treatment guideline
TB	Tuberculosis
THE	Total health expenditure
UCSF	University of California San Francisco
UHC (program)	Universal health coverage
UHC (facility)	Urban Health Centre
USD	United States dollar
WHO	World Health Organization
WHOPES	World Health Organization Pesticide Evaluation Scheme

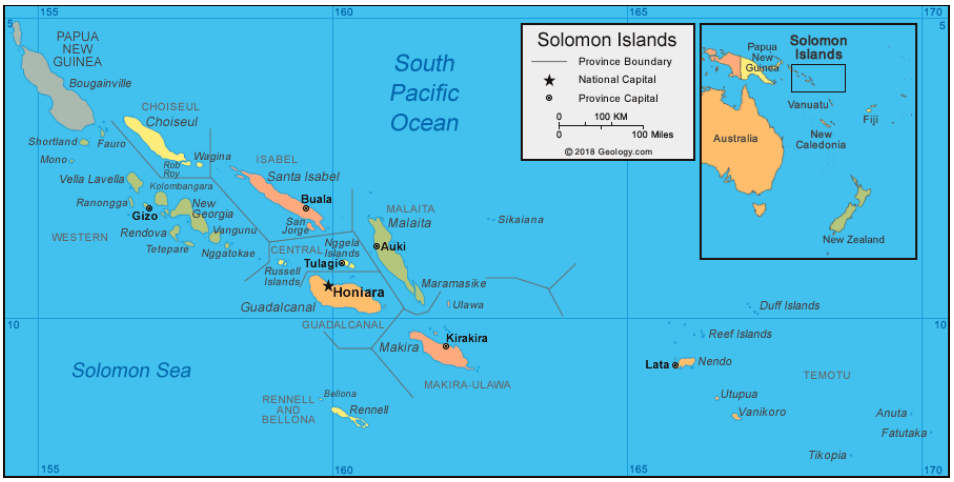
BACKGROUND

1 General background and country profile

The Solomon Islands is a lower middle-income country comprising six major islands and over 900 smaller volcanic islands, coral atolls and reefs located in the South Pacific, east of Papua New Guinea and north of Vanuatu. The land area of just 28,896 km2 is spread across an area of ocean measuring more than 1.5 million km2.

The country encompasses the capital territory, Honiara, and nine provinces (Central Islands, Choiseul, Guadalcanal, Isabel, Makira, Malaita, Rennell-Bellona, Temotu and Western.

Figure 1- Map of Solomon Islands



The population is dispersed throughout more than 8,000 villages on 350 inhabited islands and speaks over 80 distinct languages. About 80 % of the population resides in rural areas – mainly in coastal villages. Village populations range from a few dozen on the small, outer islands, to up to a few thousand inhabitants in the contiguous population areas on the larger islands. The household size averages six people.

There has not been a national population census since 2009. In 2018, based on revised National Statistics Office projections from the 2009 census, the estimated total national population was 667,044 and is expected to reach 764,412 by 2025.

Almost 24% of the population resides in Malaita and 22% in Guadalcanal – the two most populated provinces – while the greater urban area of Honiara City Council houses around 13% of the total population. Honiara is a common transit point for people travelling between provinces and islands.

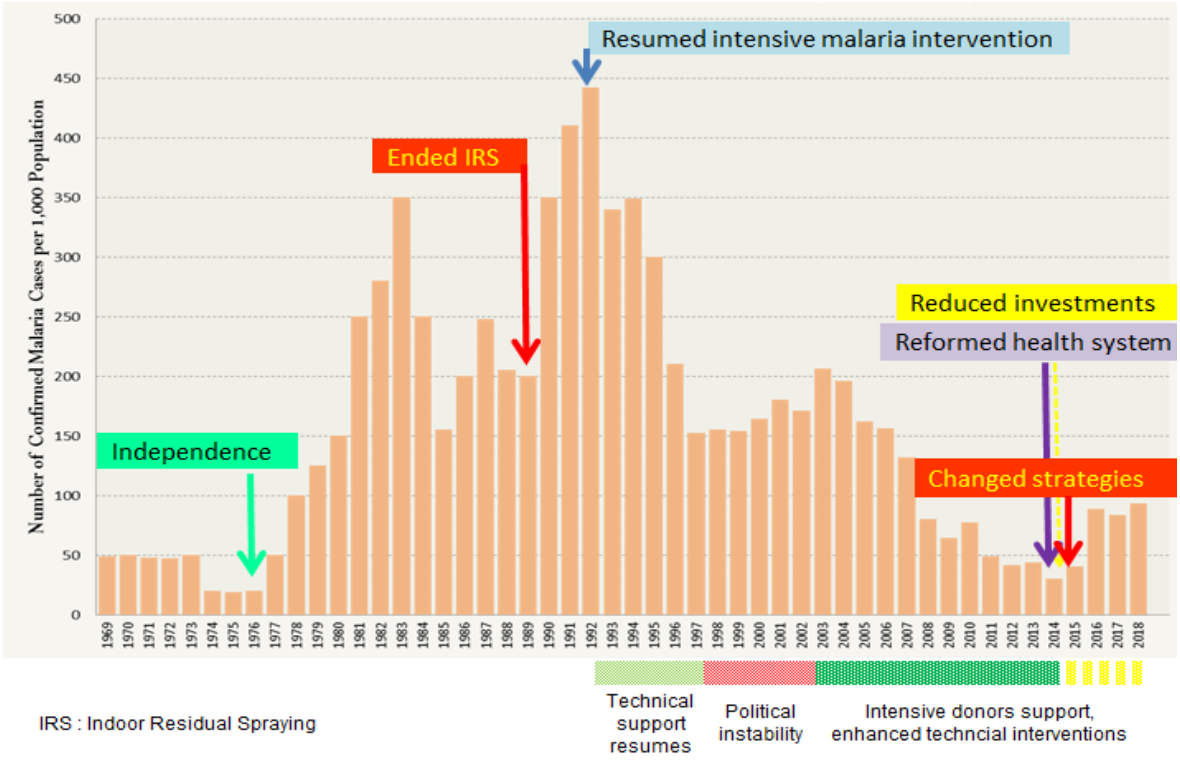
At the other end of the population spectrum, Rennell-Bellona (Renbel) is the least populated province with less than 1% of the total population.

1.1 Malaria in the Solomon Islands

The Solomon Islands is one of the most highly malaria endemic countries in the Asia-Pacific region. Two species of malaria are commonly present: *Plasmodium falciparum* and *P. vivax*, although other species are occasionally reported. Historically, *P. falciparum* has accounted for at least two-thirds of all confirmed cases. *Anopheles farauti* is the principal mosquito vector of malaria.

Figure 2 illustrates a clear history of the positive (and negative) effects of malaria interventions, development partner support, and other factors, and their impact on malaria transmission and disease burden.

Figure 2- Annual Parasite Incidence per 1,000 Population, Solomon Islands, 1969-2018



In the 1970s prior to achieving independence from Great Britain, the Solomon Islands came close to eliminating malaria with fewer than 20 cases per 1,000 people.

After 1988, when indoor residual spraying (IRS) ceased, cases climbed, reaching an all-time high of almost 450 cases per 1,000 in 1992. That same year incidence in Honiara reached an unbelievable 1,072 per 1,000.

Since then, the Solomon Islands has made great progress in reducing the burden of malaria. Intensive malaria control strategies and technical support were reintroduced in the mid-1990s, including the widespread availability of insecticide treated bed nets and a resumption of targeted IRS. These interventions continued throughout the 1990s and into the first decade of the 2000s when cases continued to decline (except for the period 1998-2004, when many aspects of health

service delivery were disrupted by the ethnic tensions that particularly affected Guadalcanal and Malaita Provinces).

Global Fund support started in 2003-04. From 2011-2015 the country received extensive Australian aid support. The combination of financial support resulted in a decrease of the Annual Parasite Incidence (API) from over 200 per thousand in 2003 to just below 30 per 1,000 in 2014 – a level that triggered a reorientation of the Programme towards elimination.

Since 2015, the API has increased, reaching 107 in 2019 (Figure 3). The same trend has been seen in the test positivity, and annual blood examination rates (Figure 4) indicating incidence data accurately reflects the malaria situation.

Figure 3 - Trend of Annual Parasite (all species and P. falciparum including mixed infection) Incidence per 1,000 persons in the Solomon Islands (2003-2019)

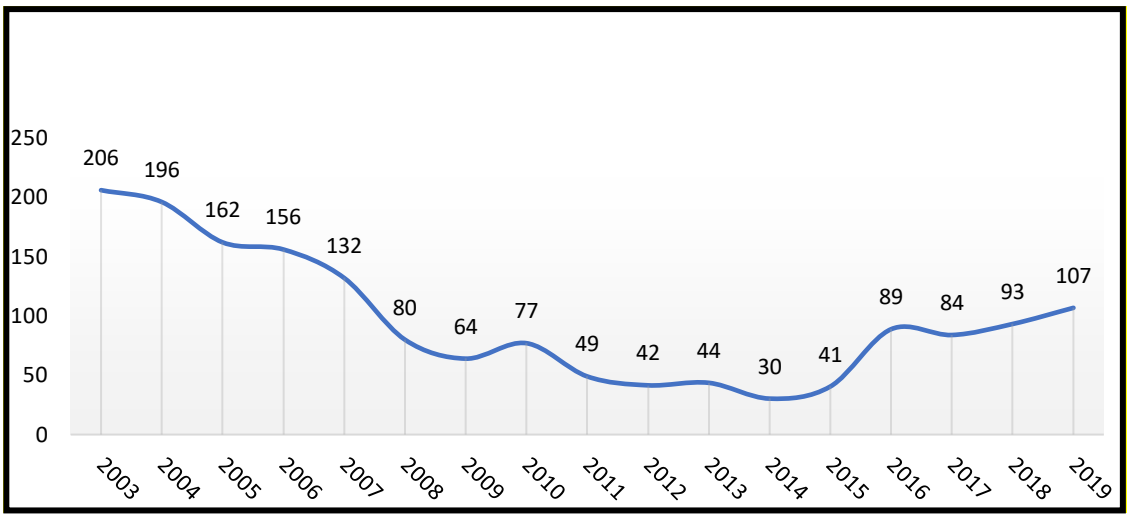
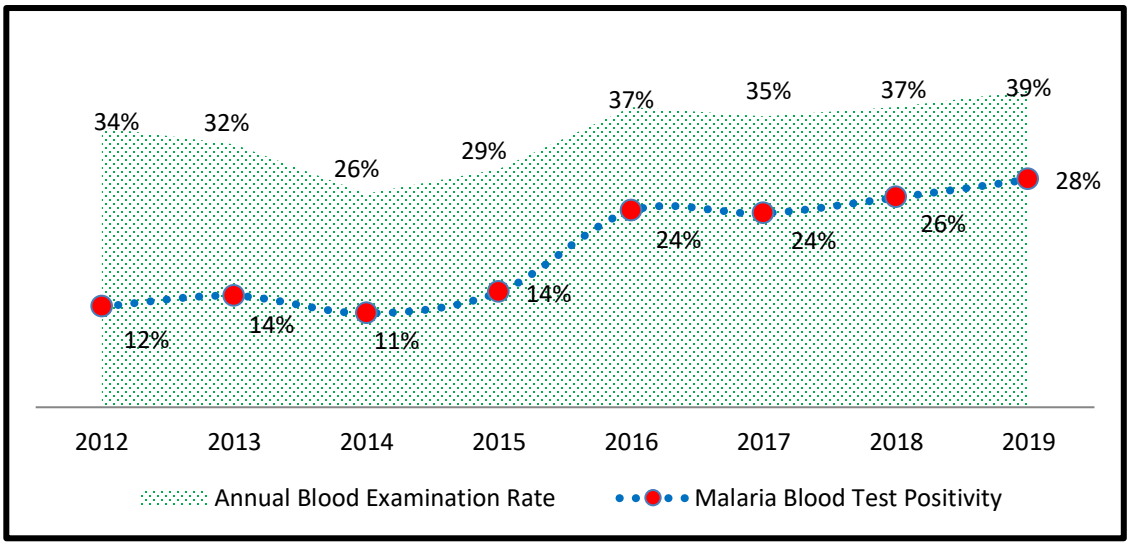


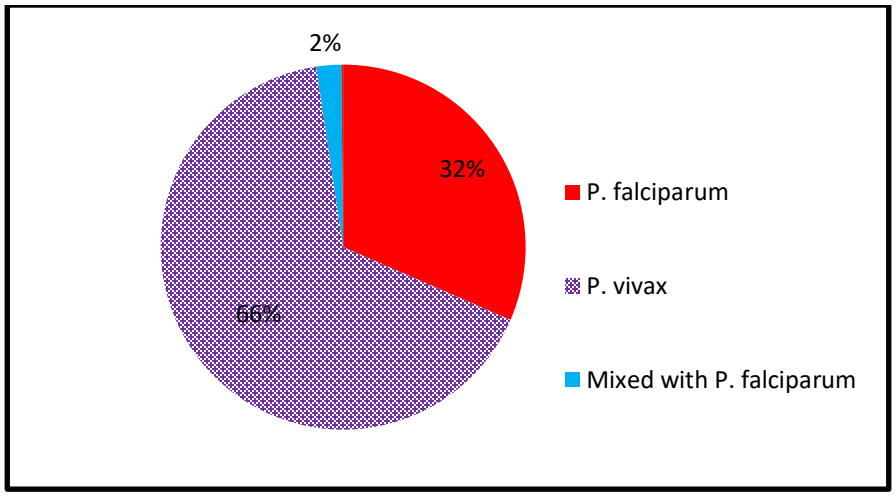
Figure 4 - Annual Malaria Test Positivity and Annual Blood Examination Rates in Solomon Islands – 2012-2019



1.2 Malaria parasite species

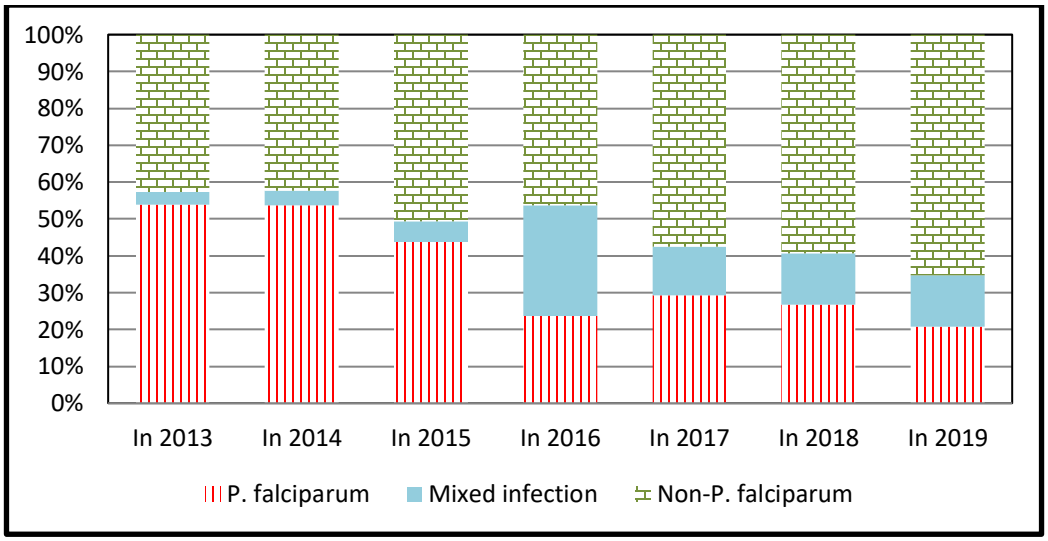
Four human malaria species have been reported in the Solomon Islands, of which two are predominant: *P. falciparum* and *P. vivax*; the other two species (*P. malariae* and *P. ovale*) are rarely reported. The most recent validated data from 2019 indicate that falciparum malaria accounted for 32% of reported confirmed cases; vivax malaria for 66%; and falciparum-containing mixed infection accounted for 2% (Figure 5).

Figure 5 - Microscopic Confirmed Cases by Species, 2019
Total Confirmed Cases N=16,789



The proportion of *P. vivax* is steadily increasing. Figure 6 shows that the proportion of cases due to *P. falciparum* alone or mixed infections declined steadily from more than 55% in 2016. Since then, the proportion of *P. falciparum* declined to 35% in 2019.

Figure 6 - Trend of Species Distribution by Year, Nationwide (2013-2019)

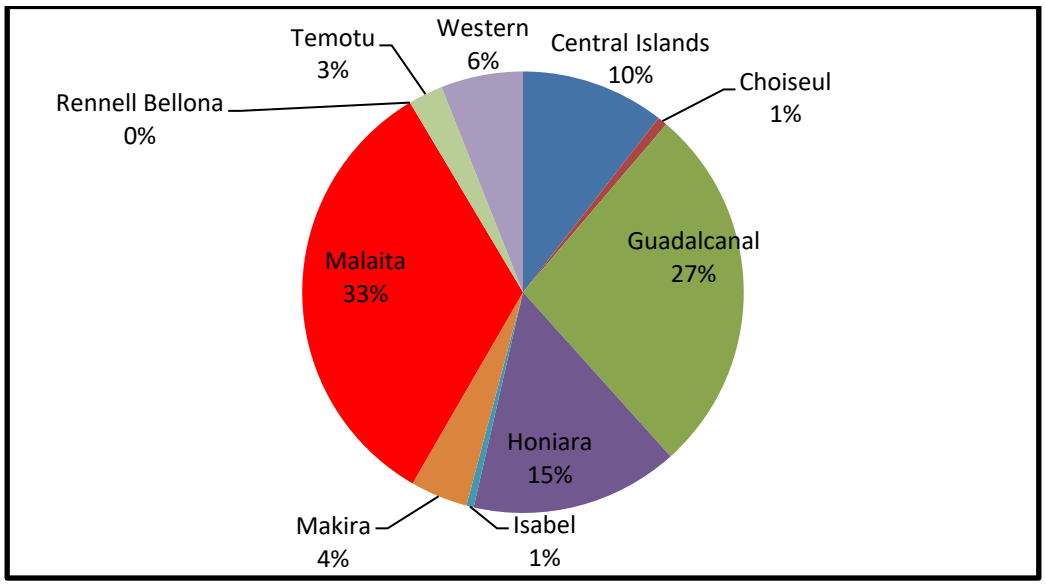


1.3 Malaria by province

Historically, malaria is endemic in all areas in the country, except Rennell-Bellona province (where there are no vector mosquitoes).

The burden of malaria is variable; four provinces contribute approximately 86% of the malaria burden in the country in 2019 (Figure 7). Those provinces are Central Islands (10.5%), Guadalcanal (27.1%), Honiara (15.2%), and Malaita (33.1%). The malaria caseloads, in the other six provinces Choiseul (0.7%), Isabel) (0.5%), Makira (4.2%), Rennell-Bellona (0%,) Temotu (2.5%), and Western (6.0%) attributed to the overall national malaria burden, are marginal (14%). This burden distribution in 2019 remained significant in Malaita and Guadalcanal due to their population size.

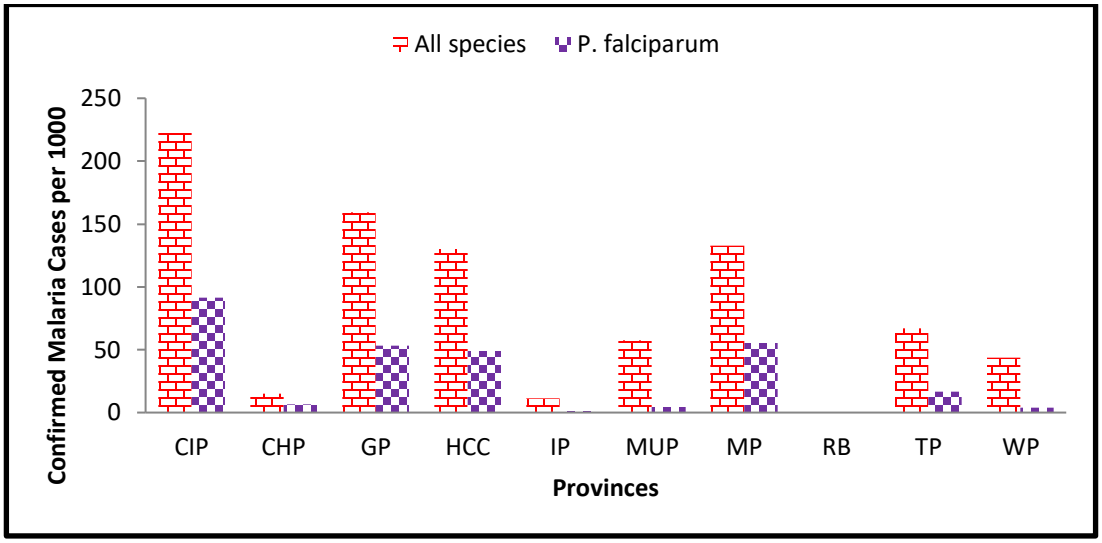
Figure 7 - Proportion of Confirmed Cases by Province - 2019



API has been increasing rapidly in Central Islands Province, which is now the highest in the Country at 380.1 per 1,000 based on validated (recounted) individual case records held at the Provincial Health Office (PHO). It is followed by Malaita with an estimated API of 127.1 and a group of three other provinces with very similar transmission levels (Temotu, Honiara and Guadalcanal), each with an API around 80 per 1,000; Temotu has increased sharply since 2017 (Figure 8). API has remained unchanged at just over 50 per 1,000 in Makira but has doubled since 2017 in Western and Isabel. Choiseul's API has halved to 11.2 per 1,000 and it has overtaken Isabel as the province with the lowest malaria endemicity (apart from Renbel); it will potentially be the first province to reach elimination.

Malaita has had an almost 20% reduction in caseload and API, and its proportion of the total number of cases nationally has decreased from almost one-half (45.3%) to about one-third (33.6%). It is followed by CIP (35% increase in caseload, 19.5% of the national burden), Guadalcanal (32% increase, 18.9% of the national burden), and Honiara (15% increase, 12.2% of national burden). The caseload in Makira, which fell by 82% from 2016 to 2017, is almost unchanged in 2018 (4.8% of the national burden of infection).

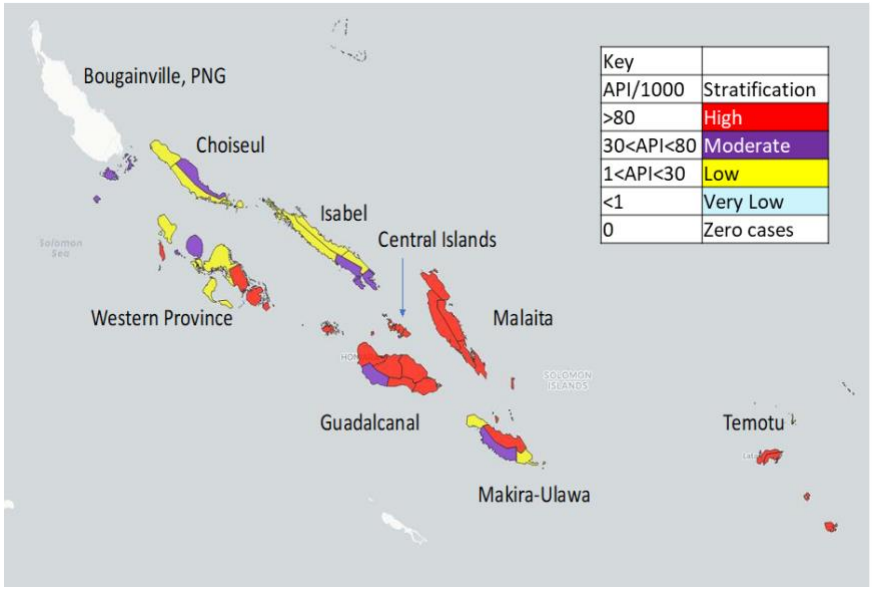
Figure 8 - Annual Parasite Incidence by Province in 2019



1.4 Risk stratification

The Country has been stratified based on 2019 data in terms of high, medium and low burden using API (Figure 9). The 24 health zones with high malaria burden are mainly in the central part of the Country such as health zones of Central Islands (6), Guadalcanal (5), Honiara (3), Makira (2), Malaita (4), Temotu (3), and Western (1). The eight health zones with moderate malaria burden are in different health zones of Choiseul (1), Guadalcanal (1), Isabel (2), Makira (1), and Western (3). The 12 health zones with low malaria burden are in different health zones in Choiseul (2), Isabel (3), Makira (2), Malaita (1), Temotu (2), and Western (2). One health zone, in Renbel province, is a non-malaria transmission or malaria-free area.

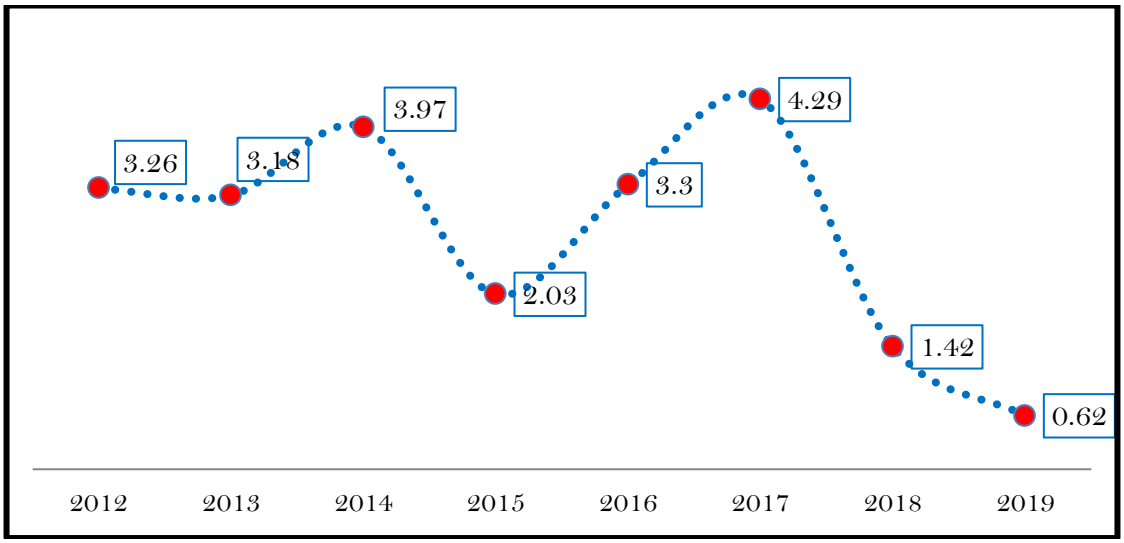
Figure 9 – Map Showing Risk Stratification by health zone, based on 2019 Data



1.5 Malaria mortality

In 2003, the malaria mortality rate was very high, at 15 deaths per 100,000 persons. Since then, there has been a continuing downward trend to around 2-3 deaths per 100,000; in 2018 and 0.62 in 2019. It represented just four confirmed malaria deaths (Figure 10). Malaria no longer features among the top 10 causes of death and accounts for less than 1% of all-cause mortality in the Solomon Islands.

Figure 10 - Trend in malaria mortality rate per 100,000, Solomon Islands, 2003-2018



Source: Health Core Indicator Report, Solomon Islands, to 2016; DHIS-2 from 2017

1.6 Factors contributing to the increase in malaria incidence

The increase in reported cases since 2015 is due to a combination of factors, the most critical of which are:

- There is still confusion within the Ministry about roles and responsibilities following the reorganisation that began in 2015. The management of the malaria control programme has changed. Responsibility for implementation has been shifted from the national level that now has primarily a coordinating, supervisory role, putting it on the provincial health directors who are not trained to manage operations and do not know how to analyse epidemiological data. (See section 2.2 below)

- The integration has meant that important functions that were part of the National Vector Borne Disease Control Programme, such as health promotion and supply chain management, have been handed over to other units of the MHMS. This means that NVBDCP must rely on other parts to the MHMS for implementation of what was previously part of its core function.

- After the distribution of bed nets in 2016, and the following round in 2018 and 2019, the number of malaria cases has continued to increase, suggesting a reduced impact of the nets (Figure 2 above). It is likely that a combination of a shortage of nets in households, coupled with low net usage, as identified in the recent MPR[1], is a major factor in the resurgence.

- The combination of LLIN with selective IRS reduced transmission from the peak in 1992 of 450 cases per 1,000 to 30 per thousand in 2014 (Figure 2). However, once IRS was withdrawn, cases immediately began to increase, suggesting that the LLINs alone are unable to reduce transmission.

- The proportion of *P. vivax* cases has increased to 59% in large part due to the lack of the use of primaquine to prevent relapses. Until primaquine use increases, relapses will continue to inflate the total number of reported cases.

- Following the introduction of the new, more sensitive RDTs in 2014, both the API and ABER, increased suggesting that the new RDTs led to better diagnosis and more cases; however, after 2016, both the API and ABER levelled off, but reported cases continued to increase, suggesting a real increase in transmission.

- There may be a natural increase in transmission in at least three provinces (Central Islands Province, Malaita, and Temotu) that has elevated the number of cases detected and treated. It is, however, difficult to measure without survey data.

There have also been programmatic changes that may be contributing to the resurgence, including a new line listing reporting form and better compliance with treatment guidelines.

2 **Malaria programme organisation**

2.1 National level

The health system reforms embodied in the Role Delineation Policy (RDP)[2] are based on the devolution and integration of previously vertical programmes at the provincial level, accompanied by the transfer of more responsibility to PHOs.

Before the RDP, the National Vector Borne Disease Control Programme (NVBDCP) functioned as a vertical programme directly involved in programme implementation down to the peripheral level. The change to a fully integrated programme has meant the role of the NVBDCP at the national level has shifted to policy and guideline development, oversight of financial allocations, technical support for central health system functions like procurement and supply management (PSM) of malaria commodities, advocacy, and quality assurance (QA) and monitoring. MHMS corporate services now fulfil other central health system functions like information management

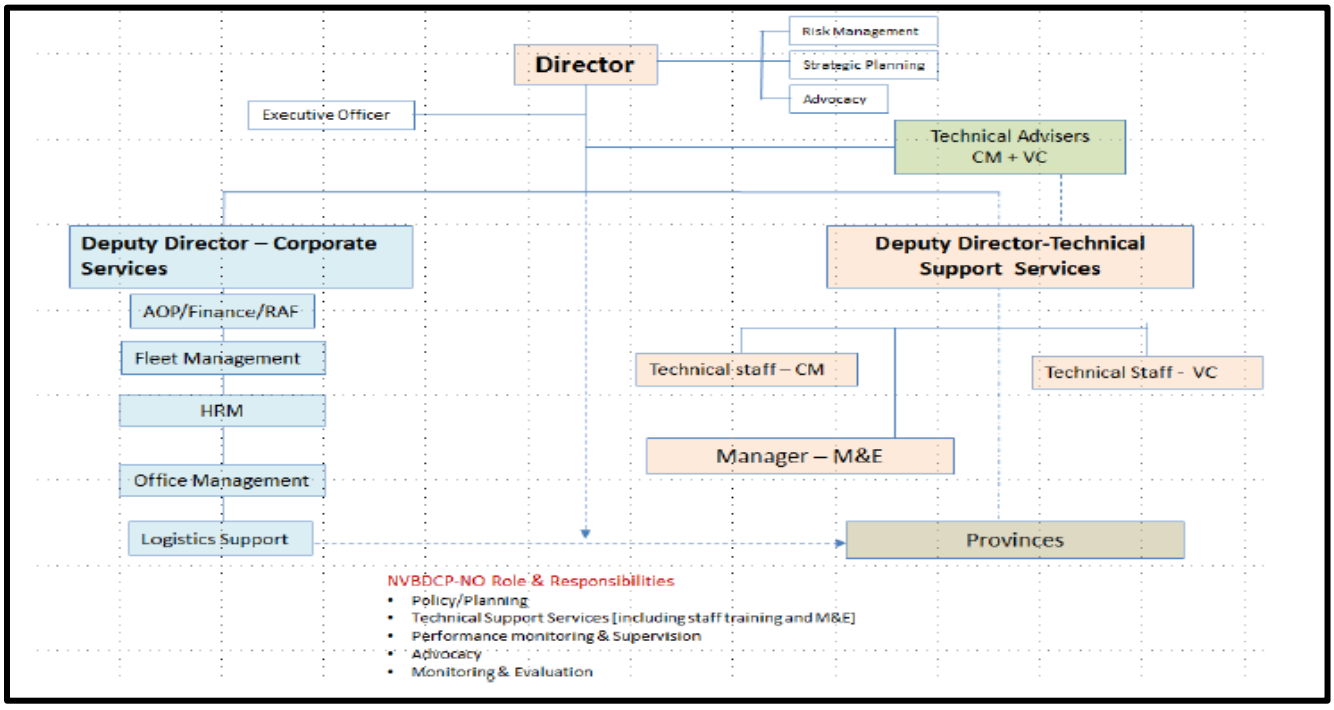
[1] Malaria Programme Review, 2018
[2] Government of Solomon Islands, Ministry of Health and Medical Services, Role Delineation Policy, 2015

and human resources, and PHOs are now responsible for local management and programme implementation.

The current NVBDCP structure at the central level is shown in Figure 12. All 18 full-time NVBDCP positions are currently occupied and funded by the recurrent government budget. A clear succession plan has not been established, raising concerns about the future of programme leadership as senior members of the team approach or move beyond the official retirement age.

The NVBDCP is due to become a subset of the Environmental Health Directorate (changing reporting lines from an Under-Secretary to the Director); that reform is yet to be implemented and is not shown in Figure 11

Figure 11- Organisational structure of the Solomon Islands NVBDCP



2.2 Provincial level

The provincial team consists of the Provincial Malaria Coordinator and the Provincial Malaria Information Officer, plus a Malaria Field Officer in each health zone, but because of the lack of housing in many health zones, the Malaria Field Officer stays in the provincial office or in Honiara. The province is responsible for developing an annual operational plan (AOP) that should align with the National Health Strategic Plan (NHSP) and the national malaria plan.

Provincial malaria staff now report to the PHD rather than the NVBDCP and are responsible for managing all Programme interventions and supervising all aspects of service delivery; once the RDP is fully implemented, this reporting line will be through the provincial Manager of Public Health Programmes.

Recent NVBDCP reviews of programme operations in selected high-burden provinces (CIP and Malaita) found that PHD capacity to manage and coordinate implementation was still limited and that this may have been a factor in reduced LLIN distribution, or the quality of distribution and post-distribution monitoring. The most recent NVBDCP annual report suggests that the capacity of the PHO and PHD to assume their delegated functions needs to be built. The Malaria Programme Review (MPR) of 2018 specifically recommended that PHDs and Programme Managers be trained on malaria elimination and enhanced control strategies (according to local epidemiology and burden).

There is some evidence from the 2019 Global Fund programme validation that the situation has improved in Malaita, with optimised LLIN distribution, supporting a reduction in API in 2018, including targeted high transmission zones.

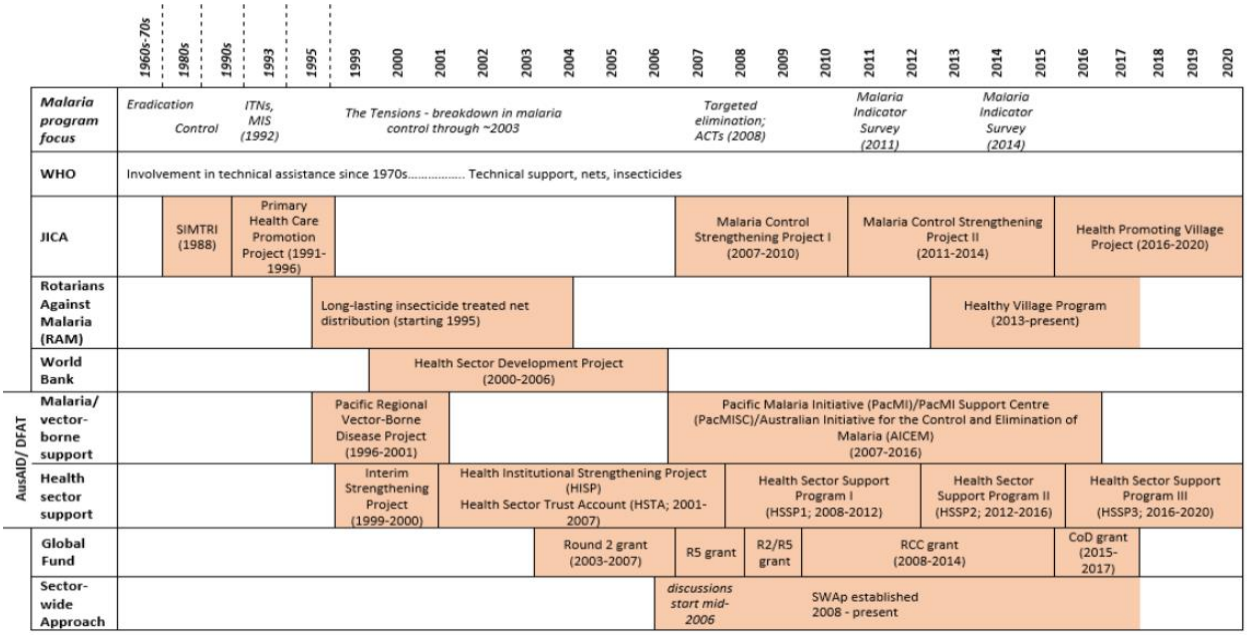
3 Malaria Financing

Financing for malaria control and elimination includes funding from the Government and donors for the health system (e.g. health workers, PSM systems, referral system, facilities, utilities and maintenance), as well as specific SIG and donor financing for the NVBDCP. VBDC-specific funding includes central level staffing, the supply of diagnostics, treatments and LLINs (as these are centrally procured and supplied with donor support) and some other operational expenses.

3.1 Donor financing

Figure 12 summarises the historical timeline of DP support for malaria in the Solomon Islands. Investments in the malaria programme from various sources were substantial from 2003 until around 2015, peaking in 2010.

Figure 12 - Timeline of selected DP contributions to malaria programme, The Solomon Islands, 1960s to date



Source: Burkot and Gilbert (2017) Discussion Paper: Reducing malaria in Solomon Islands – lessons for effective aid

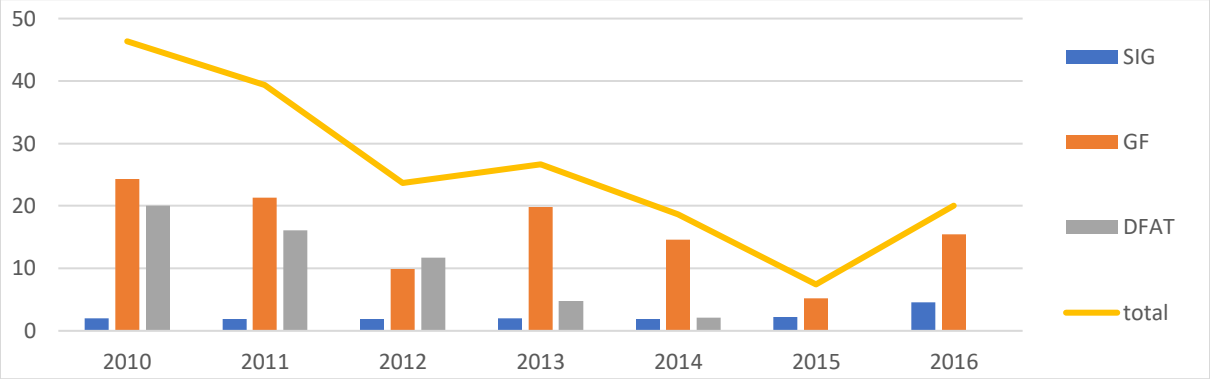
Overall, donor expenditure for malaria has declined since peaking in 2010. DFAT funding specifically for the NVBCDP has ended, although support continues through the HSSP for Provincial Malaria Grants.

The Global Fund has been the major donor to the NVBDCP since 2003-04. In 2015, the Global Fund grant shifted from a regional grant using parallel management and monitoring systems under a regional Principal Recipient (PR), to a hybrid performance-based grant known as the Cash on Delivery (COD) model, with the SIG/MHMS as PR. The grant has two components: procurement of commodities and TA directly by the Global Fund; and operational funds (the COD component), which are advanced by the Government and reimbursed by Global Fund provided specified performance targets are met. The Solomon Islands, like other Global Fund recipients, are also required to demonstrate that overall health financing and government financing for malaria are increasing.

The Global Fund remains the largest donor, contributing 51% of the expected 2020 programme budget (USD 2.2 million, SBD 18.2 million), followed by DFAT through HSSP support (SBD 4.7 million), government funds (SBD 3.1 million), and WHO (SBD 1.2 million).

The following Figure summarises NVBDCP expenditure by source of funds since 2010.

Figure 13 - Expenditure for the NVBDCP from 2010-2016 in SBD millions, Solomon Islands



Source: Ruest et al. (2018)

Implementation rates for donor financing have been historically low, although there is evidence to suggest this has improved in the last two years. The expenditure rate for the 2015-2017 COD grant was 54% and, for the 2018-20 grant, is currently 70%; however, approximately 25% of the previously accrued unspent COD funds remain unspent.

Implementation for the Provincial Malaria Grants in 2019 was 74% to the end of the third quarter, compared to 57% across the MHMS; however, implementation of off-system (or non-appropriated) donor funds is much lower (20%).

DFAT's support to HSSP is due to be renewed in 2020 when the current phase of funding ends. The design process for renewed Australian funding will take place during 2020; it is possible that it may look similar in design and value to the current phase.

No other major changes to external financing for health or malaria are anticipated.

3.2 Domestic financing

Government budget allocations for the NVBDCP increased from 2015 to 2018 but decreased in 2019, as shown in (Figure 14). It is expected to remain consistent with 2019 in 2020.

Figure 14 - Solomon Islands government budget allocations to the NVBDCP, 2014-2019

	2014	2015	2016	2017	2018	2019
Budget	2,013,984	2,100,000	4,646,060	2,027,935	2,439,058	2,307,072
Staffing	1,887,398		2,000,000	1,887,110	1,919,893	2,107,072
Other	126,586		2,646,060	140,825	300,000	200,000
% MHMS	0.69%	0.49%	0.94%	0.60%	0.62%	0.54%
Actuals	1,400,000		4,727,705	2,095,955		

Source: compiled from SIG budget documents

Note: The Government budget for NVBDCP is allocated to staffing of NVBDCP and provincial malaria teams; the 'Other' funding is used to support their annual leave fares.

The current (2020) malaria financing context is discussed in Section 8.7, along with the financing strategy for the new NMSP.

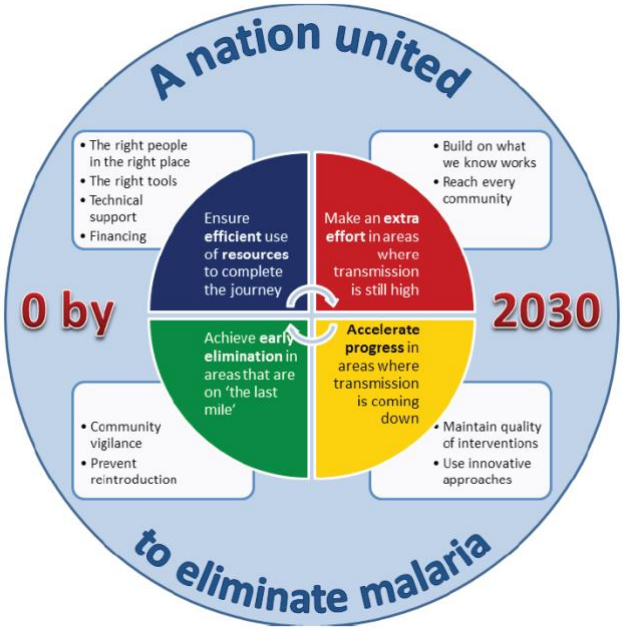
THE ROAD MAP

In 2009, Solomon Islands was one of the ten founding countries in the Asia Pacific Malaria Elimination Network (APMEN). In 2016, following recognition of the programmatic challenges and the revised trajectory of malaria API (Figure 3), the Solomon Islands pulled back from a formal commitment to malaria elimination to refocus its efforts on intensified control; it nevertheless retained its membership of APMEN.

In November 2018, with WHO and APMEN support, the Office of Prime Minister and Cabinet convened a high-level meeting of whole-of-Government, whole-of-society and development partners to re-examine the path to malaria elimination for the Solomon Islands. The principal outcome of the meeting was the *Solomon Islands Roadmap for Malaria Elimination*, which re-committed the country to malaria elimination, province-by-province, with a broad vision of achieving zero locally transmitted cases by 2030 and WHO certification three years later.

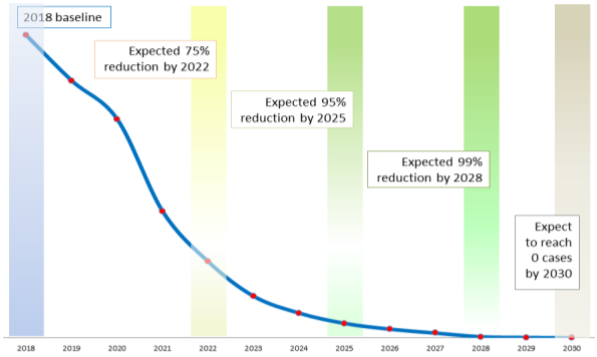
The principles underpinning the *Roadmap* are shown in Figure 15.

Figure 15 - Principles underpinning the Solomon Islands Road Map for Malaria Elimination



Relative to a 2018 baseline, the *Roadmap* envisioned malaria incidence to decline as shown in Figure 16 but given the increase in cases seen since 2015, the intermediate targets are no longer considered to be realistic, but the target of zero cases by 2030 is still considered attainable.

Figure 16– Projected rate of decline in API and intermediate goals in the Roadmap



Source: WHO background paper for the Solomon Islands Road Map for Malaria Elimination

THE STRATEGY

Based on the vision of the *Roadmap*, the *Solomon Islands National Strategic Plan, 2021-2025* seeks to define precisely what interventions will be required, and the associated costs needed to move towards elimination.

1 Programme Goals

During the period covered by this strategic plan, the overall priority will be to make the investments necessary to turn the Programme around, to return to the pre-2015 API levels and continue from there to zero cases by 2030.

- By the end of 2021, elimination-ready surveillance will be fully developed and operational in at least six low-burden health zones and then expanded in phases to cover all provinces by 2025.
- By 2025 the national API will be reduced to pre-2015 levels of 30 per thousand (Figure 2), and at least two provinces will have reached zero indigenous cases.
- After the end of 2030, there will be zero indigenous cases of malaria.
- By the end of 2034, the Country will be certified malaria-free.

2 Basic Objectives

- To maintain high LLIN coverage, increase usage, and carry out targeted IRS to bring down malaria cases in outbreak areas.
- To maximise access to and utilisation of early laboratory-confirmed diagnosis and appropriate treatment for malaria.
- To maximise programme impact through partnership and improved financial management.
- To achieve elimination criteria in pre-elimination provinces and reach and maintain API <1/1,000 in provinces already designated for elimination (Choiseul and Isabel)
- To move towards malaria elimination (in line with the Government's commitment to national elimination by 2035.
- To support the Ministry of Health in strengthening health systems nationwide.

3 Plan for Malaria Elimination

A preliminary plan to move the country to malaria elimination is appended as a separate document. It is only meant to be a framework. A more detailed, costed plan for the provinces targeted for elimination will be developed and published before the end of 2021.

4 Vector Control

Strategic Objective: To achieve and maintain universal coverage with LLINs and to implement high-quality IRS with a non-pyrethroid insecticide in outbreak areas to rapidly reduce malaria transmission and to limit secondary transmission in identified foci.

Vector control is the principal preventive intervention to reduce malaria transmission. Over the past decade, the two main vector control interventions have been LLIN and IRS.

Household-based LLIN distribution has been continuously implemented since the transition from conventional insecticide-treated bed nets in the early 2000s. The strategy assumes an effective LLIN lifespan of three years, with mass distribution on a three-year cycle nationwide (which took place most recently in 2010, 2013, and 2016).

There is ample evidence that IRS, when included as part of an overall strategy, is effective in the Solomon Islands (see Figures 1 and 2 above). In the 1970's IRS as a single vector control strategy effectively brought the incidence down to below 20 per thousand. Once it was withdrawn, cases rapidly increased. Similarly, annual, single-cycle preventive IRS was applied in selected high malaria burden areas until 2015. The annual operational household coverage ranged from 24,000 to 35,000 households, or 20% to 35% of all households nationwide. IRS was discontinued after the 2015 cycle due to financial constraints and technical and operational challenges.

The results from household-based surveys of LLIN-based control interventions are summarised in Figure 17. The standard indicator of households with at least one net is high in surveys after 2007 (75%-91%); however, the coverage and use indicators are all exceptionally low. The situation may have improved since then, but clearly, nets are not effective in some areas leading to outbreaks. New indicator surveys are needed to measure the current situation accurately, but a full malaria indicator survey is considered to be too expensive.

Figure 17 - Selected indicators of vector control interventions from national surveys, 2007-2015

Indicators	Sub-groups	DHS 2007	Census 2009	MIS 2011	DHS 2015
Households with at least one mosquito net	Any nets	48.5%	75.1%	91.0%	86.5%
	LLIN	-	-	91.0%	85.9%
Average number of nets per household	Any nets	-	-	3.5	2.6
	LLIN	-	-	3.5	2.5
Households with at least one net for every two persons who stayed in the household last night	Any nets	-	-	-	58.1%
	LLIN	-	-	-	56.3%
De facto population with access to an ITN in the household	All	-	-	-	71.2%
Slept under LLIN last night	Under-five	-	-	70.9%	69.5%
	Pregnant women	-	-	58.7%	63.2%
	All	-	-	52.1%	56.8%
ITNs were used by anyone the night before the survey	All	-	-	-	66.1%
Households with IRS in the past 12 months	All	-	-	53.7%	27.7%
	Urban	-	-	-	28.9%
	Rural	-	-	-	27.5%
Households with at least one ITN and/or IRS in the past 12 months	All	-	-	95.1%	88.0%
	Urban	-	-	-	76.6%
	Rural	-	-	-	90.3%

4.1 Implement rolling three-yearly mass distribution of LLINs to achieve universal coverage in target areas.

The next round of mass distribution will take place in 2021 covering all age groups and communities at a ratio of one bed net per 1.4 individuals except in high transmission zones in and around Honiara, where the ratio will be increased to 1 net per person to ensure full saturation of the target population. For the previous mass distribution, the number of nets needed was based on the estimated population of each village and calculated based on the ratio of 1 net per 2 people. The resulting number of nets were then delivered to each village and left for the village leaders to distribute to the households. With that system, there was no way to check on the number of nets that actually reached each household and therefore no way to determine if each household had sufficient nets. As emphasised in the last MPR, this method does not ensure that each household has sufficient nets and is probably a big part of the reason that we see the LLINs not working since 2015. This has to change. Starting in 2021, nets will be delivered to each household by the malaria staff together with a community worker who will make sure that each household has sufficient nets and that the occupants know about using the nets. Community groups will, therefore, be organised and funded to assist in the distribution to ensure that all households get sufficient nets.

Honiara and selected surrounding health zones will be saturated with LLIN with the goal of reducing the role of Honiara as the single biggest source for the constant reintroduction of cases to other provinces/islands due to the constant movement of people back and forth between the provinces and Honiara. Unless the "melting pot effect" in Honiara and surrounding areas can be reduced it will be difficult to reverse the current upward trend in reported cases nationally that is the main obstacle to elimination (and prevention of re-introduction in areas that are already close to elimination). Only the settlement areas within Honiara and surrounding health zones will receive the additional nets. This represents a bold response but is evidence-based. Cost of the additional nets will be significant, but IRS in the same parts of the town has been tried before and was only marginally successful. Hence, more aggressive use of LLINs is a viable option for getting the Programme back on track.

The projected LLIN requirements for the next three cycles of mass distribution based on the current phased system and without the nets needed for saturation in and around Honiara are shown in Table 1.

Procurement of vector control supplies and equipment will continue through the Global Fund's pooled procurement platform or equivalent mechanisms. It will ensure that the programme receives WHO Pesticide Evaluation Scheme (WHOPES) pre-qualified LLINs and WHO approved insecticides for IRS.

A buffer stock of 5% of distributed LLINs will be reserved for emergencies (e.g. natural disasters) and distribution as part of the response to outbreaks. These will be stored at the central level and strategic points around the Country.

The NVBDCP will work with Provincial Health Offices and communities to coordinate the distribution, promotion, and collection of information on LLIN coverage and use. Tracking of LLIN distribution through DHIS-2 will continue to expand to all provinces to assist in future

operational planning. Small-scale tracking surveys and follow-up at health zone level, as used in East Malaita, will continue to monitor utilisation and the condition of bed nets, and to guide top-up activities.

All distributions of LLINs will be coupled with intensified locally appropriate behaviour change communication (BCC) to promote community mobilisation and maximise high and correct LLIN utilisation and care.

Outcome targets will be set at least 90% access, and 80% of the population regularly use nets.

Table 1- Projected LLIN requirements by Province
based on a three-yearly cycle of distribution

Province	Yr1-2021	Yr 2-2022	Yr 3-2023	Yr 4-2024	Yr 5-2025
Central Islands	23603	3540	3540	24545	3682
Choiseul	26845	4027	4027	28734	4310
Guadalcanal	150578	22587	22587	166493	24974
Honiara	92345	13852	13852	97804	14671
Isabel	25695	3854	3854	27241	4086
Makira	40187	6028	6028	42648	6397
Malaita	115598	17340	17340	118298	17745
Renbel	3108	466	466	3358	504
Temotu	18190	2729	2729	18702	2805
Western	71752	10763	10763	75265	11290
National	78684	79800	79800	82540	83245
ANC clinics - pregnant women	21200	21600	21600	22880	22880
Boarding houses and Schools	20000	20000	20000	20000	20000
Emergency stockpile 5% of annual distribution	37484	38200	38200	39660	40365
Total LLIN Distribution	646585	164985	164985	685628	173708

4.2 Implement continuous LLIN distribution to maintain universal coverage amongst vulnerable and key risk populations.

Distribution channels will be established to address population growth plus any LLIN attrition in-between mass distributions. LLIN stockpiles will be established at the provincial level and at health facilities to supply these continuous distribution channels. LLINs will be provided to:

- Every pregnant woman attending ante-natal care (ANC) services (one net per pregnancy). As well as maximising LLIN coverage for infants, this approach reportedly has a positive impact on ANC attendance levels.

- Anyone indicating they have lost or damaged their net.

- All confirmed cases, in case they do not already have access to an LLIN.
- Students at boarding institutions will be issued single-size LLINs at the beginning of each school year.
- Newly arrived families in a community, if they have not brought nets with them

A significant number of students take the nets home with them even though nominally the nets belong to the school. The Programme has been reluctant to continually issue new nets because of the cost, but students come from all over the country bringing with them parasites; without nets or enough nets at the boarding houses (coupled with an effective diagnosis and treatment strategy appropriate to the setting), the transmission is likely to continue in the dormitories. At the end of the school year or during breaks, students take the parasites back home with them, resulting in spikes in cases in some areas immediately after the students return home. This is an issue where boarding schools are located in high burden areas, and students return to low burden or malaria-free areas. Ensuring that the students have nets will, therefore, become increasingly important as a way to block re-introduction to malaria-free areas of the Country.

4.3 Implement high-quality IRS with non-pyrethroid insecticide to rapidly reduce incidence in outbreak areas.

IRS will be implemented in outbreak areas as a way to rapidly bring down malaria transmission. There are currently 24 high-burden health zones (based on 2019 data) that meet the definition of outbreaks[3] and hence fall within WHO guidance for the use of IRS.[4] Only health zones in Central Islands and Malaita province will be sprayed which have a total of about 35,000 houses. Spraying will be done at the end of 2021 and the end of 2022 so that the insecticide will be on the walls of houses before the peak transmission season (February to May).

IRS will eventually be part of the response to malaria foci, but that will not happen until there is an elimination-ready surveillance system that investigates cases, identifies foci, and establishes protocols for effective response is in place.

4.4 Implement alternative vector control tools and personal protection measures as appropriate among at-risk, high-exposure populations.

The NVBDCP will try several measures to improve malaria prevention through source reduction in communities where control with anti-adult interventions may not be fully effective due to early outdoor biting and other entomological or human behavioural factors.

Coastal communities will be mobilised to clear drainage ditches and streams to speed water flow and reduce mosquito breeding. Where the pools and breeding sites are large, the NVBDCP will work with the appropriate national and provincial authorities to destroy or modify the pools and

[3] Outbreak is defined as: A case or a greater number of cases of locally transmitted infection than would be expected at a particular time and place

[4] World Health Organization, 2019, Guidelines for vector control. p 45.

lagoons drawing on previous experience with pipelines and other measures that eliminated breeding sites by changing the salinity of coastal lagoons on Guadalcanal. Where breeding sites are not able to be addressed by drainage or other modifications, the programme will assess the use of larvicides. Historically larviciding together with the clearance of streams was successfully applied in Honiara. Similar applications will be considered in other urban and semi-urban areas.

A unique combination of malaria prevention measures may be implemented in logging camps, plantations, and mines. Formal memoranda of understanding with the companies involved will be drafted to support this, following the principles of public-private collaboration described in the *Roadmap*.

5 Malaria case management

Strategic Objective: To achieve and maintain quality-assured testing of 100% of suspected malaria cases and prompt treatment and care of 100% of confirmed malaria cases as specified in the 'Solomon Islands Malaria Case Management Guidelines (2018)'

Providing universal and timely malaria case management is a key component of malaria control and elimination strategies. Quality-assured diagnosis by RDT or microscopy and prompt, effective treatment of all malaria cases according to updated national malaria treatment guidelines are the mainstays of case management in the Solomon Islands.

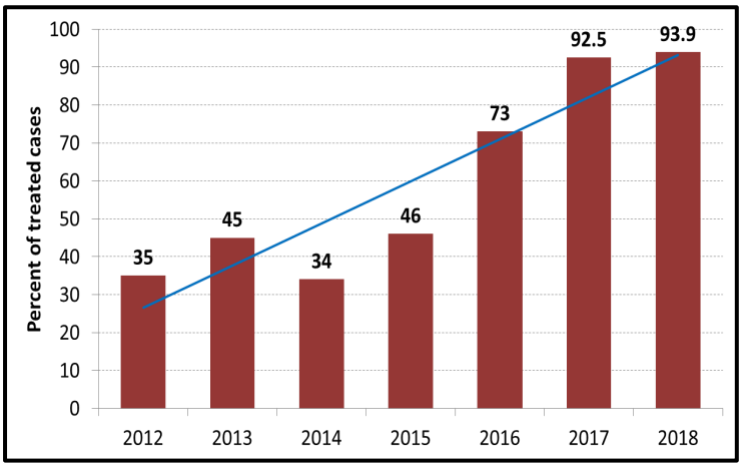
The national case management guidelines seek to ensure that malaria diagnosis and treatment will be available in every health facility in every community. It will build on the current high levels of access to correct, evidence-based diagnosis and treatment in line with the principles of universal health care.

Both microscopy and RDT are used for malaria blood test confirmation. All health facilities have malaria RDT available, regardless of whether a microscopy service is in place or not.

Private medical practitioners (that are only in Honiara and Auki) will be enlisted to fully engage with the programme. They will continue to have access to subsidised RDTs and malaria medicines in return for full compliance with the national malaria treatment guidelines and regular reporting through the malaria case management register (MCMR).

The coverage and quality of malaria diagnostic and treatment services have improved significantly in recent years (Figure 18).

Figure 18 - Proportion of treated malaria cases that received a parasitological test (microscopy or RDT), Solomon Islands, by year, 2012-2018



5.1 Maintain quality-assured diagnosis by RDT or microscopy

Case management training and supervision will continue to stress the importance of timely detection of all possible malaria cases, in high-burden as well as in elimination and prevention of re-establishment areas. Any individual presenting with a fever/history of fever must be suspected as a case of malaria and be promptly tested, regardless of any other known or suspected febrile illness. If the malaria test is negative, malaria treatment should not be administered to the patient unless other possible causes of illness have been adequately considered and ruled out (with patient referral to a higher-level health facility if appropriate).

5.2 Ensure universal access to RDTs

The programme aims to achieve and maintain 100 per cent availability of RDTs at all levels of the health system.

A new type of malaria RDTs was introduced in the Solomon Islands in 2016 that are highly sensitive to both *P. falciparum* and *P. vivax*. These new RDTs have a high level of acceptance among health workers (and increasingly high acceptance by patients) and will continue to be used.

5.3 Maintain quality microscopy services, including alignment with the RDP

Microscopy has historically been the 'gold standard' for malaria diagnosis in the Solomon Islands. In the past, there was an extensive network of microscopy points, including community-based microscopists that provided high-quality diagnoses throughout the country. That network has progressively been dismantled as the number of cases has declined, and RDTs have become universally available. Currently, there are 86 functioning microscopy points down from 106 when the network was fully deployed.

The programme recognises that high-quality microscopy will still be needed as the Country approaches elimination, specifically for patient management at hospitals and other health

facilities and for detection of infections that may be below the threshold of RDTs. Additionally, the RDP has taken the bold step of limiting malaria microscopy services to the hospital and AHC level. All other health facilities will have a regular supply of RDTs.

5.4 Ensure the quality of diagnostic services

It is essential that where microscopy remains in hospitals and AHCs, the quality will be maintained through regular supervision, refresher training when needed, repair or replacement of microscopes, and a steady supply of stain and other reagents. International standard certification for microscopists will be done in cooperation with the Australian Defence Force Malaria and Infectious Disease Institute (formerly the Australian Army Malaria Institute), WHO, and the Asian Collaborative Training Network for Malaria (ACTMalaria) based in the Philippines.

The programme will continue to strengthen its slide validation and supervisory outreach activities at national and provincial levels, steadily increasing access and coverage of AHC-based microscopists to external QA to at least quarterly. In addition, the plan under the previous Strategy to establish a slide bank and reference laboratory at the national level will be revived.

Likewise, it is imperative to assure the quality of RDTs that are procured through the GF procurement mechanism. The programme will continue to have each additional batch of RDTs checked through the WHO/Find regional quality testing and assurance programme.

The treatment guidelines address the problem of improper use and reading of RDTs by requiring regular updates and training for health workers. Both the health workers and patients must trust the RDTs the same as they did with microscopy in the past.

5.5 Ensure effective rational treatment nationwide according to the National Malaria Treatment Guidelines (NMTGs).

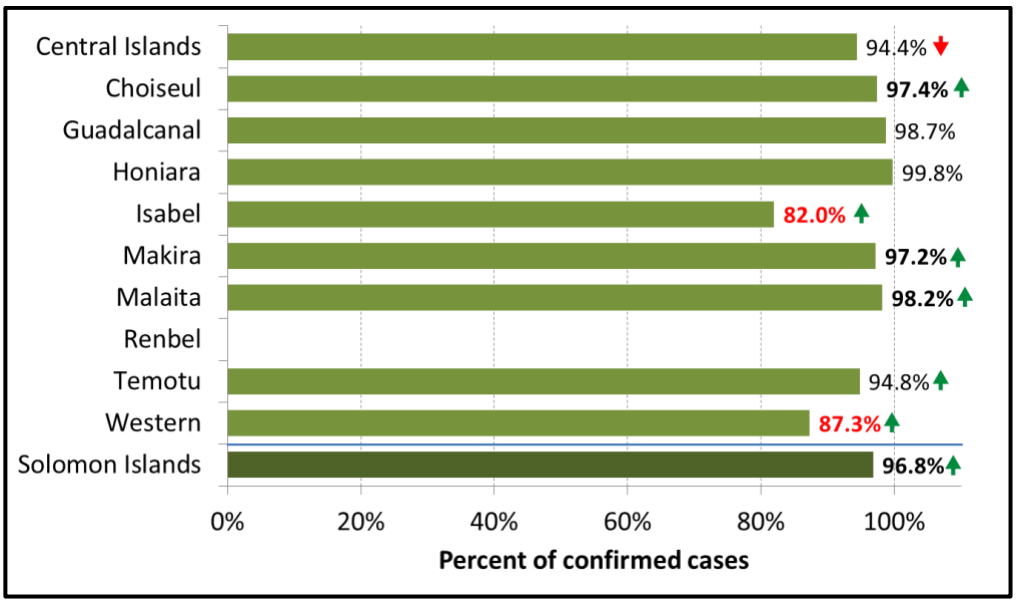
Ensuring the prompt provision of effective treatment for all confirmed cases of malaria according to the latest NMTGs[5] is essential, not only to secure rapid clinical recovery in infected individuals but also to reduce onward transmission within the population. The use of artemisinin-based combination therapy (ACT) is essential for schizontozidal treatment for all *Plasmodium* species. In addition, it is important to provide primaquine treatment (single dose) for *P. falciparum* cases as a means of targeting gametocytes and hence reducing onwards transmission, and to provide primaquine treatment (14-day or 8-week regimen) for *P. vivax* cases to target sporozoites and to ensure radical cure by targeting relapsing hypnozoite parasite stages.

Subject to progress with licensure and affordability, short course tafenoquine may be considered to replace PQ during the period of this NSP.

[5] Solomon Islands Government, National Vectorborne Disease Control Programme, National Malaria Treatment Guidelines, 2017

Overall, there has been significant improvement at the national level of the proportion of cases treated as per the *Guidelines* (Figure 19). Compliance has improved in all provinces – the increase in Choiseul, reflecting further orientation towards an elimination phase strategy.

Figure 19 - Proportion of Cases with a Confirmed Diagnosis by Province. 2018



At the facility level, case management of uncomplicated and severe malaria will continue to be strengthened through improved supervisory outreach with specific involvement of the National Programme and technical partners like WHO as required. Access to treatment for malaria will be maintained through the Programme working with the National Medical Stores and financing partners like the Global Fund to ensure accurate quantification, and with PHOs and other disease control programmes like tuberculosis to ensure timely, effective distribution of drugs and diagnostics.

As malaria incidence falls, elimination plans in selected provinces will look to include illnesses other than malaria in their case management strategies. Piloted interventions with Integrated Community Case Management (iCCM) of patients presenting with fever or other compatible symptoms may be considered in selected areas and facilities. It will bring in interventions such as treatment of diarrhoea and acute respiratory infections as part of the community-based treatment packages to detect and manage febrile illness, as recommended in WHO regional and global strategies. This will require health worker and community reorientation beyond health facility catchment areas.

Stock management and distribution systems remain key constraints to health workers being able to follow the recommended treatment guidelines. Supervisory outreach and refresher training of health workers are also not yet undertaken with sufficient regularity or consistency, and Programme review activities have revealed some residual misconceptions about correct treatment – especially in the absence of G6PD point-of-care testing.

5.6 Roll out G6PD point of care testing

The reluctance of clinicians to prescribe primaquine for the radical cure of *P.vivax* will remain an obstacle to malaria elimination into the foreseeable future until an alternative to 8-aminoquinolones is found. In the interim, to mitigate for this, the program will implement a phased stratified rollout of screening tests for G6PD, beginning with qualitative POC G6PD RDTs (e.g., CareStart G6PD, BinaxNow G6PD) and a quantitative POC G6PD analyser. Test characteristics important for the stratified allocation to health facility type of G6PD Screening tests include cost, heat stability, and ease of use. The programme envisages in full elimination mode all health facilities will be equipped with quantitative POC G6PD analysers.

The MHMS, National Medical Stores and the NVBDCP will work with external agencies to fund the procurement of the new G6PD POC tests and their progressive introduction into selected provinces and health facilities, including those providing neonatal care. Pre-elimination and elimination areas will be prioritised. The tests will be introduced to all health facilities in those provinces and health zones, and nurses will be trained on-site in administering the test, interpreting the result, and providing treatment as per the national treatment *Guidelines*. In provinces that are still focusing on malaria burden reduction, G6PD rapid tests will be introduced at provincial hospitals first, followed by AHCs and finally all other peripheral health facilities. A refresher education campaign focusing on the areas of the *Guidelines* relating to *P. vivax* infection and G6PD will be integrated with POC test rollout, regardless of the prevalent malaria burden.

Test results will be recorded in patients' health record books and also in the health facility register, so the results are available to clinicians, in order to guide their choice of treatment in case of future *P. vivax* infection. The programme will also work with the national Health Information Unit to explore the feasibility of a centrally maintained register of individuals' G6PD status within DHIS-2.

G6PD tests will be routinely carried with survey teams in elimination provinces when conducting focused screening and treatment in response to transmission foci. Promotional campaigns will be conducted by the NVBDCP and Health Promotion Unit (HPU) during community outreach, educating them on what is being tested, why, how, and the implications for safer treatment; individuals will be encouraged to know their G6PD status, and to look after their health record books for future reference.

6 **Surveillance and Response**

Strategic Objectives:

- Establish case-based surveillance in low-burden health zones.
- Strengthen reporting and outbreak response in high-burden health zones.
- Monitor drug resistance,
- Strengthen entomological surveillance and carry out regular insecticide resistance monitoring,

As the programme moves toward elimination, it will need to have in place an elimination-ready surveillance system. As the country approaches elimination, surveillance will evolve from a support activity to become a key intervention equal in importance to vector control or case management.

The surveillance system will be built around the national health information system (DHIS2) that is utilised by all MHMS programmes. Fully functional malaria surveillance will be a model that other health programmes can follow thereby strengthening the whole health system.

For case-based surveillance, the timeliness of the response is key to halt transmission, so a '2-4-7' criteria will be adopted. It will require that individual cases in low-burden zones be reported within two days, that full investigations be completed within four days, and that appropriate responses will be mounted as early as possible, but within seven days.

6.1 Build an elimination-ready surveillance system

Starting in selected low burden health zones, a model for case-based surveillance in line with WHO principles and guidelines will be formulated through an operational research process that will explore the use of innovative protocols and tools that will be incorporated into a fully formulated and costed national malaria elimination plan. Staff will be trained, protocols will be defined, forms will be designed and field-tested, and reporting mechanisms put in place to have a fully operational surveillance system in low-burden zones up and running by the end of 2023. Key concepts and interventions to be included in an elimination-ready surveillance system are discussed in the accompanying Elimination Plan (Annex 1).

Where possible and appropriate, the approach to building elimination-ready surveillance systems will leverage the substantial funds and collaborative training opportunities that are becoming available for integrated surveillance of fever, acute respiratory tract infection (ARI) and influenza-like illness (ILI) as part of evolving approaches to COVID-19 preparedness and response. Any individual presenting with a fever or history of fever must be suspected as a case of malaria and must be tested promptly, regardless of any other known or suspected febrile illness.

Beginning in 2021 with Choiseul and Isabel and Western Province, two health zones will be selected in low \-burden areas for developing the elimination-ready surveillance system, Transition of other provinces to the new surveillance system will take place in phases as health zones reach the level of having an incidence of ten or fewer new cases per mont-.

6.2 Expand and strengthen the capacity to respond to outbreaks.

Outbreak response preparedness will be established in high- and medium burden areas. In low-burden areas approaching elimination, protocols for response to imported cases and/or active foci will be developed. It will involve training and the provision of equipment and supplies. A 3% buffer stock of LLINs, insecticide, RDTs and drugs will be maintained at national and provincial levels to deal with outbreaks, active foci, and natural disasters.

In high-burden areas, historical aggregate case data for villages or health zones will be used to set a threshold to monitor spikes in cases. Together with local knowledge and feedback from

zonal malaria, officers will support outbreak detection. Response efforts will be supported by Provinces and NVBDCP when required.

6.3 Monitor drug resistance.

The NMCP will monitor antimalarial drug resistance in line with the latest WHO guidelines and with technical support from WHO. First-line treatment efficacy will be monitored through therapeutic efficacy studies (TES) conducted at sentinel sites.

In areas of very low malaria transmission, the number of cases is not sufficient to provide statistical significance for TES studies. Where surveillance for elimination is piloted and implemented, drug resistance will be monitored in all malaria cases through integrated drug efficacy surveillance (iDES).

6.4 Conduct Entomological surveillance.

Entomological surveillance will include a periodic assessment of the vector species present; their abundance and seasonality; vector behaviour (i.e., time and place of biting, resting and host preference); and insecticide susceptibility status and underlying resistance mechanisms (if feasible, and with technical support through the Australia-funded JCU project) to predict susceptibility to interventions.

Routine monitoring of the coverage and impact of interventions will include the physical condition of LLINs, the actual use of nets and their perceived usefulness by end-users, and the residual effectiveness of the impregnated insecticides.

The data generated will be used to inform decisions on the selection of insecticides and timing of spraying activities, contribute to bed net replacement strategies and cycles, and guide the development and deployment of tools including BCC activities. In areas of elimination and prevention of re-establishment, entomological surveillance in specific foci will allow health zonal officers to monitor receptivity and target spraying and vector control measures.

6.5 Monitor insecticide resistance

It is expected that core vector control interventions will remain effective in most areas of the Solomon Islands. However, the emergence of physiological resistance of mosquitoes to insecticides and the combination of vector and human behaviour that sustains continued transmission would present major challenges to the achievement of *Roadmap* and NSP targets. If left unchecked, insecticide resistance could lead to substantial increases in malaria incidence and the reappearance of malaria-related mortality over the medium to longer term, with reversal of the public health gains achieved.

The programme will review its current plans for monitoring and managing insecticide resistance to ensure that robust strategies are in place. A TA was planned for 2020 to draw up a resistant monitoring plan, but that will probably not happen because of the COVID-19 pandemic. The first approach to managing resistance will be to use insecticides with different modes of action for LLINs and IRS. Vector behaviour that compromises the effectiveness of core interventions will be addressed through operational research and the use of new tools (if available and affordable).

7 Behaviour Change Communication (BCC)

Strategic Objective: Implement health promotion activities to support the enabling environment for malaria control and elimination, to strengthen knowledge, attitudes and practices amongst populations at risk, and to promote community-led engagement.

The NVBDCP (through surveys, field observations, programme monitoring and evaluation, programme reviews, and feedback from health workers) has identified key behavioural factors in the population that impede and reduce the effectiveness of programme interventions, including low bed net utilisation and improper care; exposure to outdoor biting vectors through night-time activities; diagnosis and treatment-seeking behaviour when fever or other symptoms suggestive of malaria occur; compliance with treatment (in particular, completion of 14 days of PQ for radical cure of P. *vivax* or mixed infection); and attendance for follow-up testing within two months of completion of treatment. The *Strategy* aims to encourage the population to accept Programme interventions addressing malaria prevention, diagnosis and treatment, and the health system orientation and the information needed by the community to support proper malaria surveillance and response.

7.1 Use comprehensive behavioural change communications to support interventions and promote malaria elimination

The NMCP in cooperation with the MHMS Health Promotion Unit will support malaria control and elimination efforts through comprehensive behaviour change communication (BCC), community mobilisation and advocacy. Community service organisations will be mobilised to support and help deliver messages at the village level, specifically during net distribution campaigns and in villages that will be sprayed.

Additional behavioural factors relate specifically to health workers (e.g. awareness of patients with atypical presentations or risk factors for malaria, including travel history from an elimination area to a high-burden area) and community leaders (e.g., to harness communities, civil society organisations, youth groups, and church congregations).

8 Programme Management

Strategic Objective: To strengthen Malaria Programme leadership, management and implementation capacity at national, provincial and local levels to plan, implement, and report on high impact malaria interventions in a timely manner

The NVBDCP has responsibility for all aspects of malaria-related technical components: policy and guideline development; technical support to PHOs, staff in the health zones and at lower-level facilities, quality assurance for vector control and clinical services; monitoring; and advocacy strategies.

8.1 Provide Technical leadership

The NVBDCP has responsibility for all aspects of malaria-related technical components: developing and updating programme policies and guidelines; technical support to PHOs, staff in the health zones and at lower-level facilities, quality assurance for vector control (including

entomological surveillance, and monitoring and managing insecticide resistance); quality assurance for diagnostic and clinical services (including therapeutic efficacy studies); forecasting, PSM and distribution of commodities (discussed below); commissioning periodic external programme reviews; strengthening information systems and support, and managing the information (including data analysis, data interpretation, monitoring and information sharing); and advocacy strategies.

High-level technical support will be provided by a full-time WHO Technical Officer whose terms of reference will include operational support at the field level facilitating the implementation of the malaria elimination plan and eventual transition to a malaria-free status

8.2 Support harmonised planning, budgeting, and timely mobilisation of funds

More energetic harmonisation between national and provincial health planning processes under the health reforms will be reflected in collaborative planning processes and an annual malaria technical meeting.

Through the planning and budgeting cycle, the Programme, provincial partners and the MHMS Finance Division will develop an integrated malaria AOP and budget for the coming year (national and for each province), ready for inclusion in national health budget submissions and Provincial Malaria Grants). The Programme will continue to work with Finance to ensure effective disbursement of funds and for financial monitoring.

The Programme will also look for opportunities to harmonise available resources across different programmes for outreach and logistics support. As much as possible, this will include harnessing resources for COVID-19 responses to strengthen – rather than risk undermining – integrated malaria and other disease surveillance systems, case management within broader systems of primary care, and PSM. It will also enable community-based activities (e.g., LLIN distribution, IRS, case investigation, management of foci) to continue uninterrupted but with appropriate safeguards, even if transmission of COVID-19 is detected in the Solomon Islands.[6]

8.3 Support development of human resources

There is a shortage of trained cadres for delivery of good quality services which has affected the implementation of key services. The Programme will support the MHMS further to develop human resources at the national and provincial level; this will include skills related to organisational and malaria-relevant programme development and quality assurance and to boost capacity to generate, manage, and analyse core data.

The programme will continue to seek scholarship opportunities for PMCs to attend the Diploma of Applied Parasitology and Entomology Programme in Malaysia.

A management training course along the lines of the Management of Malaria Field Operations that has been organised for many years in Thailand and elsewhere in the Region will be designed

[6] WHO, 2019. *Q&A: Malaria and COVID-19*. Available from: https://www.who.int/emergencies/diseases/novel-coronavirus-2019/question-and-answers-hub/q-a-detail/malaria-and-the-covid-19-pandemic

and implemented locally at the Solomon Islands National University that will have two objectives: (1) improve management capacity at the provincial level for planning and implementing malaria elimination interventions, including the collection and use of data; and (2) to do specific malaria elimination training like what has been done in the Greater Mekong Sub Region to train malaria field staff on malaria elimination focusing on elevating surveillance to become a key intervention in line with the development of an elimination-ready surveillance system described in Section 6.1 above and to develop the new set of skills that will be required for the implementation of the Malaria Elimination Plan.

The resumption of quality-assured IRS will require sound technical leadership at the national level. An external adviser with experience organising and implementing IRS will be brought in to aid in the implementation process.

As several programme leaders and managers start to draw closer to retirement age, a programme-specific workforce and succession plan will be developed to support sustainable human resources capacity and consolidate career structures at the national and sub-national level, in line with the RDP.

8.4 Support effective monitoring and timely reporting of critical data.

The programme is responsible for ensuring timely and effective monitoring and reporting at both provincial level (data analysis and utilisation) and national level (for tracking, and to guide intervention). Case management outcomes and vector control activities and coverage will be monitored through routine operational data gathered via the national health information system (DHIS-2) and the MCMR.

National managers will also assist provincial health and malaria teams to collate, compile, and interpret monthly malaria and health service delivery data from the provincial DHIS-2 dashboard, as well as monitor provincial trends for selected indicators.

8.5 Promote health system reform.

The NVBDCP will continue its 'pathfinder' role in strengthening provincial management, primary health care, and integrated outreach services. Many health systems functions at a provincial level can benefit from the broader range of enhanced malaria control activities – especially those associated with malaria elimination. The programme will promote and advocate integration during the Annual Health Conference and periodic scheduled reviews; the annual malaria technical meeting provides a forum for provincial case studies to be presented and relevant approaches adopted in other provinces. During provincial monitoring visits, opportunities for integrating outreach activities across programmes and activities, training, diagnostic services, health information, commodities management, health care provision at the community level, and supervision will all be explored.

8.6 Conduct an external review.

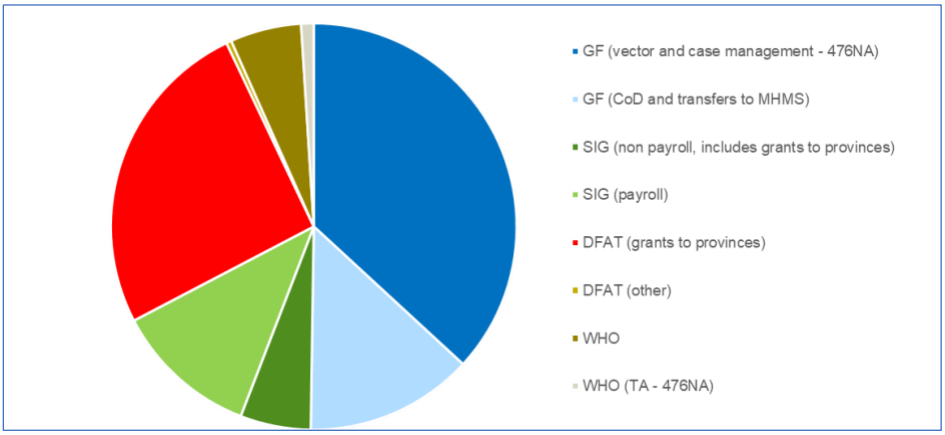
An independent review of the programme will be conducted in early 2023 to assess progress and, if necessary, change elements of the strategy, to ensure the country is on the trajectory to achieve zero cases by 2030.

8.7 Budget and financing strategy.

8.7.1 Current malaria financing context.

Figure 20 shows the composition of projected malaria funding for the Solomon Islands for 2020; just over half of the malaria budget will come from the Global Fund, either through off shore (pooled) procurement or COD payments. The total budget envelope is SBD 18.2 million (USD 2.2 million), or SBD 11.2 million in-country expenditure if Global Fund off-shore procurement is excluded.

Figure 20- Projected all-sources malaria budget (SBD 18.2 million), by source, Solomon Islands, 2020



At a time when health financing in the Solomon Islands is under increasing pressure, the NSP seeks the most efficient ways to use available resources while addressing the very ambitious agenda set by the *Roadmap*.

8.7.2 Budget overview for the NSP

The programme has undertaken a detailed costing and budget prioritisation exercise in relation to the NMSP.

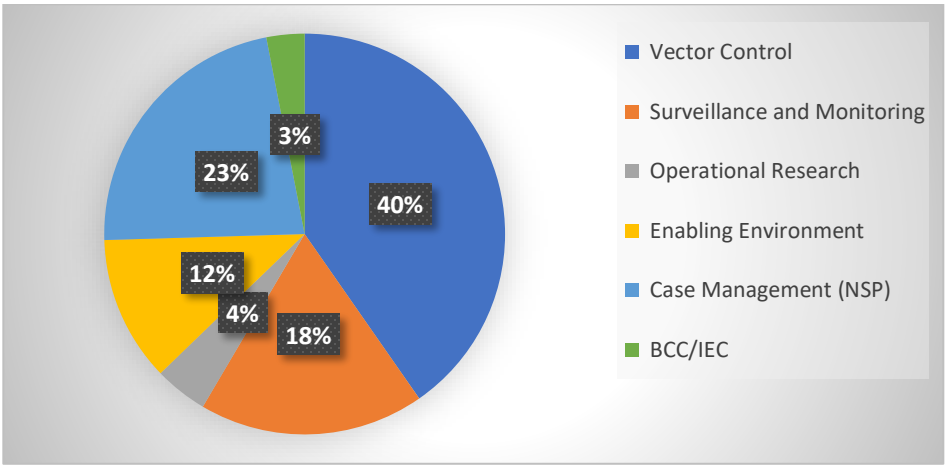
The cost of implementation is estimated at USD$18,994,060 across the full five years of the *Strategy*, and USD$12,295,370 for the first three years (2021-23). Vector control is allocated 40% of the whole-of-strategy budget, case management 12%, surveillance and monitoring 18%, and BCC 3%, and the enabling environment 12% (including human resources, short- and long-term technical assistance and, M&E costs).

Table 2 summarises the costing by objective for the NSP by year it shows the proportionate allocation to each thematic for the full five years of the plan.

Table 2 - Budget Summary by Objectives and Year, Solomon Islands NSP 2021-25

NSP Objectives	2021	2022	2023	2024	2025	5 Yr Total
Vector Control	1,020,899	925,186	933,891	1,033,685	268,437	4,182,099
Surveillance and Monitoring	706,000	755,000	772,500	705,000	692,000	3,632,009
Operational Research	347,200	80,133	101,007	157,151	102,309	787,800
Enabling Environment	1,443,918					1,443,918
Case Management (NSP)	910,895	884,169	959,929	820,049	659,990	4,235,032
BCC/IEC	1,614,048	456,357	465,236	1,804,123	504,436	4,844,201
Grand Total	6,042,961	3,100,846	3,232,563	4,520,008	2,227,173	19,125,060

Figure 21 - Budget by Strategic Objective in the National Malaria Strategic Plan, Solomon Islands, 2021-25.



If the *Strategy* can be fully funded, the programme will seek opportunities for technical efficiency in the way services are delivered, including through collaborative planning and implementation with other public health programmes at the provincial and more peripheral levels. This will strengthen the cost-benefit to the national health system of a significant ongoing investment in malaria.

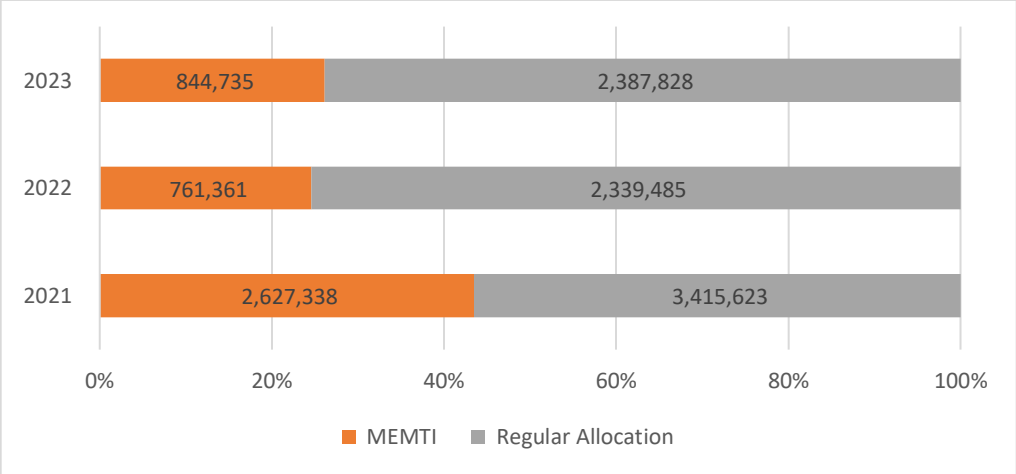
8.7.3 Global Fund allocation

The Global Fund has made a malaria allocation to the Solomon Islands of USD 8,031,136 of the total NSP budget of USD$ 12,376,370 for the period of the grant

Table 3 – Summary of Global Fund Request by Module and Year

Funding Request by GF Modules	Yr - 2021	Yr 2 - 2022	Yr 3- 2023	3 year Total 2021-2023
RSSH Human resources for health, including community helath workers		5,000	65,000	70,000
RSSH Laboratory Systems	10,000	30,000		40,000
RSSH governance and planning	25,000	25,000	25,000	75,000
RSSH Management info and ME	55,000	120,000	55,000	230,000
RSSH Management info and ME	61,000		61,000	122,000
Case classification	347,200	80,133	101,007	528,341
RSSH: Financial management systems	555,000	555,000	555,000	1,665,000
RSSH: Health Products Management systems	616,931	-	-	616,931
RSSH: Integrated service delivery and quality improvement	826,988	-	-	826,988
Case management	910,895	904,169	959,929	2,774,993
Vector control	2,634,948	1,381,544	1,410,627	5,427,118
Total				12,376,370

Figure 22 – Proportion of Funding Request by Year and Allocation



A detailed budget showing the proposed utilisation of Global Fund resources is included in Annex 1.

8.7.4 MEMTI

The Malaria Elimination will support the sub-national approach to elimination interventions in selected provinces of the Solomon Islands in Melanesia and Timor-Leste Initiative (MEMTI), a new funding stream introduced by the Global Fund for the 2021-23 funding cycle. The approach has been informed by a malaria-focused health system *Landscape Analysis* and impacts modelling, and a MEMTI *Financing Options* scoping exercise – both commissioned by the Global Fund.[7,8]

MEMTI is an innovative financing mechanism rather than conventional malaria-specific funding. It was designed to:

- Help countries to move away from a 'business as usual' approach
- Significantly accelerate progress towards the elimination of malaria
- Address broader health system barriers to malaria elimination
- Act as a catalyst for new investment in malaria and malaria-relevant health, system interventions, or function synergistically with existing investments (whether malaria-specific or broader health-system strengthening related).

No up-front MEMTI allocation has been earmarked for any of the eligible countries. The Global Fund will assess the quality of the overall funding requests and the alignment of MEMTI-relevant content in the submission with the principles described above, including the availability of Government or donor co-financing for elimination-relevant aspects of the NMSP or Global Fund funding request.

The SIG has not yet made any policy commitments (e.g., raising or borrowing additional funds) in response to the recommendations of the *Landscape Report* or other communications from the Global Fund about MEMTI. Moreover, the *Financing Options* paper concluded that the original MEMTI funding model – especially the mobilisation of additional SIG or donor financing alongside MEMTI – was unlikely and probably not feasible due to: the current macro-economic conditions in the Solomon Islands; the diversion of Government and donor financing to preparedness and response to COVID-19; and the likely impact of the pandemic on domestic finances (and therefore aid budgets) in donor countries.

The *Landscape Analysis* identified eight critical areas of the health and malaria systems for priority investment for malaria elimination; most have been integrated into some form into this

[7] Malaria Elimination Initiative (University of California, San Francisco), Nossal Institute for Global Health (University Of Melbourne), 2020. *A landscape analysis to assess the technical, operational and financial feasibility of malaria elimination in Papua New Guinea, Solomon Islands, Timor-Leste and Vanuatu*

[8] Ian Anderson, Manuel Hetzel, and Luis Segura. MEMTI discussions in PNG: findings and key recommendations. 31 March 2020.

NSP – i.e., they have been adapted where necessary to match the more detailed in-country implementation scenarios that emerged during strategic planning:

- More formally devolve authority for malaria activity planning and implementation at PHO level, build capacity among provincial staff to effectively assume delegated functions, and further integrate supervision and community outreach activities across public health programmes.

- Assist selected elimination provinces (e.g., those with an API < 10 per 1,000 and/or a total number of cases < 1,000 per year) to develop and implement provincial elimination strategies; this could potentially be enhanced through the placement of technical assistance (e.g., with surveillance, planning and logistical skills) within the national programme and possibly also in selected provinces (e.g. though health volunteer programs).

- Further strengthen financial management processes to improve timeliness and access to funds and establish a consistent mechanism to transfer funds from the PHO to health zones, taking into account the anticipated expansion of banking services in rural areas.

- Improve the timeliness and use of surveillance data as progress is made towards elimination, and establish an active case surveillance and response system, which could be further facilitated by improved internet connectivity, activation of the SMS module within DHIS-2, and direct data entry at facilities.

- Strengthen and standardise stock reporting and feedback mechanisms across provinces and consider increasing buffer stocks at health facilities and provincial levels, given the complex distribution logistics. Explore the interoperability and syncing of *mSupply* and DHIS-2 systems.

- PHOs, health zone staff, and facility-based staff should work in partnership at the local level with provincial government officials, communities, and church organisations to develop and implement sustainable models of community engagement, based on the principles articulated in the *Roadmap*. At the national level, a genuine inter-sectoral mechanism to monitor and coordinate the implementation of the *Roadmap* still needs to be established.

- Maintain high levels of treatment of clinical malaria and LLIN coverage while adding to this the radical cure of *P. vivax* cases to shift from a control to an elimination trajectory.

- Improve case detection to accelerate and maintain elimination

Several additional areas for potential MEMTI funding emerged during strategic planning:

- Supporting the increase in LLIN coverage from one net per two persons to one net per person in high transmission health zones

- Support for the introduction of G6PD POC testing in selected health zones in low transmission settings (and potentially for piloting tafenoquine for radical cure of *P vivax* infection, subject to licensure and availability)

- Optimised interventions in support of provincial elimination strategies, including enhanced surveillance and use of IRS as part of the outbreak response.

8.7.5 Utilisation of the MEMTI funding stream within the costed Strategy

The VBDCP has costed a range of activities within the NMSP as relevant to the overall purpose of MEMTI and is requesting a total of USD$3,639,753 under this funding stream. These activities are summarised in Tables 4 and 5, below, and presented in detail in the detailed budget (Annex 2). The proposed activities include a range of elimination relevant RSSH investments that will be bolstered by parallel development partner investments in health systems, either nationally or in selected 'pre-elimination' provinces (Choiseul, Isabel and potentially Western).

Table 4 – Summary of MEMTI Requests by Module

Module	MEMTI
Case classification	528,341
RSSH governance and planning	75,000
RSSH: Financial management systems	1,665,000
RSSH: Health Products Management systems	616,931
RSSH: Integrated service delivery and quality improvement	826,988
Vector control	461,175
RSSH Human resources for health, including community health workers	60,000
Grand Total	**4,233,435**

Table 5 - Summary of the Funding Request Showing Breakdown by MEMTI and Regular Allocation

	MEMTI	Regular Allocation
Case classification	528,341	
Case management		2,774,993
RSSH governance and planning	75,000	
RSSH Management info and ME		352,000
RSSH: Financial management systems	1,665,000	
RSSH: Health Products Management systems	616,931	
RSSH: Integrated service delivery and quality improvement	826,988	
Vector control	461,175	4,965,943
RSSH Laboratory Systems		40,000
Grand Total	**4,173,434**	**8,132,936**

The largest allocations within the requested MEMTI funds are for

1. Solving some of the significant financial management problems at the provincial level that have, for a long time has handicapped malaria field operations as well as other programmes by posting expatriate consultants to three provinces. There has been significant improvement in getting funds from the central level out to provinces but the provincial managers have not been doing a good job using the funds as intended. This will be a cross-cutting intervention that was developed by DFAT to link with its broader support to provinces but was never funded. The total cost for three consultants for three years is slightly more than $2 million so we are proposing cofunding 50:50 with DFAT.

2. Defining an elimination-ready surveillance system that will be part of and, at the same time, strengthen the overall health information system. It will initially involve six low burden health zones. We have chosen to make this an operational research activity that includes a TA, training, system design for the DHIS2, and development of SOPs.

3. Building up critical infrastructure that will strengthen malaria elimination and other health activities at the health zone level. This includes refurbishing or building houses for staff, constructing sheds, and providing reliable transportation so that malaria operations, as well as outreach by other programmes, can take place in a timely, efficient manner.

4. Improving communications at health facilities that do not have internet connections by providing high-frequency radios. This will allow timely reporting and real-time support for treatment.

9 Enabling environment

Strategic Objective: To progressively strengthen the enabling environment and the underlying health system, in line with the Role Delineation Policy for the health sector and the Solomon Islands Roadmap for Malaria Elimination.

The ability of the Solomon Islands to achieve elimination depends specifically on the strength of the overall health system. It heavily depends on the ability of the health system for many critical functions, including delivering funds on time to provinces and health zones so that time-dependent field operations, such as LLIN distribution and IRS, can occur in a timely manner. It is also dependent on the health information system to collect, transmit, analyse, and act on a wide range of epidemiological and operational data, including data on positive cases, data on deaths, stocks of antimalarial drugs, rapid diagnostic tests, number of nets distributed, and the number of houses sprayed. Human resources are also a significant portion of the overall health system, as is infrastructure, including; buildings, vehicles, and communications. The Malaria programme was once called the Ministry of Malaria because of its fiscal autonomy and vertical structure. Now, with reforms within the MHMS, resources are shared with other Programmes, and other programmes have to share resources with the Malaria Programme: it has to be a two-way street.

In analysing the needs of the NVBDCP as it moves towards elimination in terms of the overall health system and what the programme can contribute to strengthening the system, it is clear that

the greatest need on both sides is at the health zone level. It is at the Area Health Centre where the nurses manage primary care and where the Malaria Programme bases its distribution of LLINs, IRS operations and as it moves toward elimination and its case-based surveillance.

Health zones in areas of both high and low transmission will be selected for strengthening. In low transmission zones that are on the path to elimination, health system support must exist for rapid reporting, case investigations, and response to malaria cases and foci. In areas of high transmission where the objective is burden reduction, the health system also needs to support rapid reporting, ensuring the diagnostic tests and medications are available for treating malaria patients. Additionally, the health system needs to support LLIN distribution and IRS, both of which rely heavily on logistical support and outbreak response.

It is not possible for the NVBDCP and its partners, including the Global Fund, to solve every problem faced by the health system. However, by carefully selecting health zones and tailoring the type and level of support needed, the programme can provide examples of best practices, which can be replicated elsewhere.

9.1 Promote increased political commitment to elimination

Political leadership and engagement will be strengthened through more active management of the *Roadmap.* This more than just an MHMS role and requires partnership with a wide range of stakeholders, led by the Prime Minister's Office via the multi-sectoral National Advisory Committee (NAC). Inter-provincial coordination will be strengthened through the annual technical meeting, improved opportunities for cross-border visits and collaboration, and provincial representation on the NAC.

9.2 Expand and improve the workforce and provide technical assistance

VBDCP needs to provide training for two groups of staff. (1) Provincial staff need to understand the complexities of planning and managing malaria control/elimination activities at their level and (2) VBDCP and health staff at the provincial and health zone levels need to understand what malaria elimination means, how it is different from malaria control, and what it means for them in terms of their roles and responsibilities. It is proposed that a course on managing malaria field operations (MMFO) similar to what has been offered for many years at Mahidol University in Thailand by the Asian Collaborative Training Network for Malaria (ACTMalaria) be established at the Solomon Islands National University that is more tailored to the Pacific context and that emphasises skills needed for malaria elimination. A Solomon Islands-based course would be a regional course that could eventually take participants from PNG and Vanuatu.

The strengthening of technical assistance at the central and provincial level will be an important feature of this NSP. It will start with the re-establishment of a malaria-specific WHO Technical Officer position at the national level. It will rapidly extend to include field technical support staff (engaged through relevant volunteer programmes or in conjunction with academic partners) in at least two elimination provinces.

The programme will request DFAT, JICA, WHO and any other relevant partners for volunteer-based technical support for poorly performing provinces. Professional volunteers will be placed in selected provinces, and health zones staff will bolster implementation. The volunteers will be

tasked with providing day-to-day technical support for management, planning, and operations. Volunteers will be appropriately trained with the technical skills needed to achieve outcomes specified by the NSP, aligning with indicators produced by the National Malaria Team.

9.3 Improve information management

The programme is responsible for ensuring timely and effective monitoring and reporting at both provincial level (data analysis and utilisation) and national level (for tracking, and to guide intervention). Case management outcomes and vector control activities and coverage will be monitored through routine operational data gathered via the national DHIS-2 health information system, and the monthly malaria line listing form, the Malaria Case Management Record. National managers will assist provincial health and malaria teams to collate, compile, and interpret their monthly malaria and health service delivery data from the provincial DHIS-2 dashboard and monitor provincial trends for selected indicators. Additional modules required for malaria elimination or outbreak response will be integrated into the DHIS-2 system.

9.4 Promote a sustainable model of community engagement

Community involvement has always been a weak component of the NVBDCP. It is going to become critical as the programme moves towards elimination. The programme proposes to address the problem by (1) Adopting a model of community engagement similar to Citizens Voice and Action;[9] (2) Sponsoring a workshop that brings together key players to motivate activities in support of malaria elimination; and (3) Forming and supporting national and provincial-level malaria elimination committees. (4) Under the umbrella of Healthy Islands/Healthy Villages directly support LLIN distribution and IRS operations.

9.5 Undertake regular transmission risk stratification,

As better data on malaria incidence by island, village, or community becomes available, the programme will move towards micro-stratification of transmission risk at those more local levels. It will provide specific and focused guidance for better targeting interventions and potentially improved cost-effectiveness.

9.6 Improve Reporting.

A significant problem that has been identified by the VBDCP as well as by the overall national health information system is the lack of timely and complete reporting from health facilities, especially those in remote areas where there is no cell coverage. As the Malaria Programme approaches elimination, the real-time reporting of malaria cases and foci become more and more critical. Currently, it can take up to a month for reports to be entered in the DHIS2 system, so any sort of rapid response in line with the 2-4-7 timeline is not possible. As cell coverage expands, this will become less and less of a problem, but over the next three to five years, it is not going to change. The MHMS proposes to provide high-frequency radios to selected health facilities that are capable of transmitting data as well as voice communications for use by all health programmes, particularly in areas where rapid notification and response is required. The

[9] https://www.unicef.org/policyanalysis/rights/files/Day_1_Citizen_VoiceandAction-World_Vision.pdf

radios and peripheral equipment will be one contribution by the VBDCP to the overall health system that can make a significant difference.

9.7 Streamline Financing.

The single biggest challenge facing the programme as identified by the recent Malaria Programme Review[10] and the GF Landscape Review is that operational funding does not reach the Health Zones on time or often not at all so planned activities cannot be carried out on time. The recent Landscape Analysis[11] "proposed to more formally devolve authority for malaria activity planning and implementation to PHOs, build capacity among provincial staff to assume delegated functions effectively, and further integrate supervision and community outreach activities across public health programmes by providing training to Provincial Health Officers and other key provincial staff on managing malaria field operations. (See Section 9.2)

The programme also proposes to collaborate with DFAT to post locally recruited financial advisors in selected provinces to supervise and support financial management processes. The same advisors could supervise volunteers posted to selected provinces as proposed above.

9.8 Strengthen procurement and supply management and logistics.

The programme will continue to build on its good relationship with the National Medical Stores to support accurate quantification and timely procurement. The plan does not propose to directly fund strengthening of the supply chain management system as this is adequately supported by other partners. The Programme will continue to work through the Global Fund pooled procurement mechanism for core vector control and case management commodities.

9.9 Improve Information management.

The programme will also continue to work closely with the Health Information Unit on elimination-focused enhancements to DHIS-2 and related reporting systems. It will include the progressive introduction of mobile phone (SMS) based reporting and communication modules to support the 2-4-7 strategy in elimination areas and will contribute to timely and effective monitoring and reporting, including provincial-level data analysis and utilisation and enhanced national-level tracking.

9.10 Expand/Upgrade Infrastructure.

9.10.1 Upgrade/construct housing for health staff.

The Government's General Orders require that every health worker be provided with housing at his/her assigned post. This requirement states that in rural areas including at Area Health

[10] Solomon Islands Governemnt Ministry of Health and Medical Services, "Solomon Islands Malaria Programme Review," (Honiara2018).
[11] Nossel Insitute for Global Health at the University of Melbourse Malaria Elimination Initiative at the University of California, and the World Health Organization,, "A Landscape Analysis to Assess the Technical, Operational, and Financial Feasibiity of Malaria Elimination in Papua New Guinea, Solomon Islands, Timor-Letse, and Vanuatu," (San Francisco: University of California San Francisco, 2020).

Centres where no government or rental housing exists, the health workers have to live elsewhere, usually in the larger towns. It is a significant handicap that the Malaria Programme and other health programmes have been faced with for many years. It makes little sense to have staff assigned to rural areas if they spend most of their time sitting in the town, as is now the case. For the Malaria Programme, the Technicians are the front line. They work under the direction of the nurses to report cases, coordinate follow-up, and in elimination, zones carry out preliminary case investigations and implement responses. These tasks that will become increasingly important as the country moves towards elimination.

The VBDCP, together with its partner Rotarians Against Malaria (RAM), proposes to upgrade/repair existing structures and where appropriate build simple multi-family houses in selected health zones so that the malaria technician, nurse, and where applicable a volunteer can live. Additionally, existing housing will be upgraded/repaired. The new structures will be similar to houses constructed with the help of RAM a few years ago in Guadalcanal and Central Islands Provinces. They come as prefabricated units that are assembled with the help of Rotarian Volunteers. It becomes the responsibility of the occupants to pay rent that will go towards maintaining the houses. Prior experience has been very positive with these sorts of houses.

9.10.2 Refurbish or construct storage sheds.

Sheds exist at some health facilities that are used by the NVBDCP for LLINs, IRS supplies, and equipment, as well as general storage by the health facility. More are needed. It is going to be increasingly crucial at health zones where IRS will be implemented due to a large amount of equipment and insecticides that need to be safely stored. Facilities need the capacity to receive and store LLINs before a mass distribution, as well as nets for continuous distribution between mass campaigns. In rural areas, no such storage facilities exist.

It has been a long-standing problem for the Malaria Programme. Having a multi-purpose shed that can serve the needs of a health facility for malaria as well as other programmes is therefore essential.

The NVBDCP, together with its partners, including the Global Fund, propose to provide multi-purpose sheds or make modifications/upgrades of existing sheds at selected health facilities. As with the houses, Rotary Against Malaria has, in the past, provided prefabricated sheds to some key facilities, primarily in Guadalcanal and Central Islands Provinces. Provision of sheds based on demonstrated need, primarily in the more remote areas that can be used by all health programmes is proposed.

9.10.3 Strengthening key logistics by purchasing boats, outboards, and vehicles.

Reliable shared transport is a long-standing and urgent need for all health programmes throughout the country, but the need is most critical at the health zone level. In the larger towns, vehicles, boats, and outboard engines can be leased for activities such as LLIN distribution or IRS campaigns, however, in the more remote areas, no such facilities exist. LLINs cannot be distributed without a vehicle or boat, nurses cannot do any sort of outreach without transport, and supplies cannot be moved to where they are needed. A health facility where the staff never leave because there is no, or limited transport is severely handicapped. Transportation is, therefore, a

key component of health-system strengthening which cannot be overlooked. Health zones that are significantly disadvantaged by the lack of serviceable transport in the form of vehicles, boats, or outboard engines will be identified and supplied with the needed transportation, together with funds for petrol and regular maintenance.

9.11 Innovation and research.

The fundamental purpose of a research and innovation programme is to improve the delivery of services and progress towards malaria elimination. Based on available programmatic data and other operational information, the programme will generate a research agenda for both operational monitoring and innovative enhancements. The components of the agenda will be designed to maximise operational utility and impact across four areas of programme activity:

- vector control and entomological surveillance;
- case management;
- elimination-ready surveillance; and
- social and behavioural research

The programme will maintain existing partnerships with academic and research institutions like Solomon Islands National University, DP-funded technical support activities (e.g., James Cook University, Walter and Eliza Hall Institute) and WHO, and will continue to seek opportunities for new ones.

The programme will continue its close working relationship with the World Bank and the MHMS Finance Division for ongoing health system research and analysis of programme financing

Annex 1 – Detailed Budget

NSP Detailed Budget							
NSP strategic objective	**Description**	**Yr 1 - 2021**	**Yr 2 - 2022**	**Yr 3- 2023**	**Yr 4 - 2024**	**Yr 5 - 2025**	**5 yr total 2021-2025**
Operational Research	Case classification training	15,000	-	-	-	-	15,000
Operational Research	Training budget for health zone & provincial officers (cecil)	47,200	-	-	-	-	47,200
Operational Research	Supervisory support at health zone level	30,000	30,000	30,000	30,000	30,000	150,000
Operational Research	Supervisory support at provincial level	25,000	25,000	25,000	54,000	54,000	183,000
Operational Research	Data collection (case classification)	15,000	18,800	19,600	66,500	11,800	131,700
Operational Research	Training ans supervision resources	-	6,333	6,407	6,651	6,509	25,900
Operational Research	System design and development using DHIS2 platform	30,000	-	-	-	-	30,000
Operational Research	TA to support surveillance and response intervention	145,000	-	-	-	-	145,000
Operational Research	Design Operational Research (development of SOP for operational research and integrate into elimination plan)	20,000	-	20,000	-	-	40,000
Operational Research	Develop elimination guidelines	20,000	-	-	-	-	20,000
Surveillance and Monitoring	Monitor the insecticide resistance in sentinel sites	-	-	5,000	-	-	6,509
Surveillance and Monitoring	Monitor the adult vector composition	-	-	2,500	-	-	2,500

	and behaviors in sentinel sites						
Surveillance and Monitoring	Monitor the residual effect of LLIN	-	-	4,000	-	-	4,000
Surveillance and Monitoring	Conduct training on entomological field practices for HZ officers	-	5,000	5,000	5,000	5,000	20,000
Surveillance and Monitoring	Conduct regular drug resistance monitoring	-	20,000	-	30,000	-	50,000
Surveillance and Monitoring	Conduct regular quality diagnostic service monitoring	-	-	-	-	-	-
Surveillance and Monitoring	Conduct external competency assessment of core microscopists	10,000	-	-	10,000	-	20,000
Surveillance and Monitoring	Conduct refresher training on malaria microscopy	-	30,000	-	-	-	30,000
Surveillance and Monitoring	Conduct refresher training on case management	-	-	60,000	60,000	-	120,000
Surveillance and Monitoring	Conduct periodic external program reviews	-	100,000	-	-	-	100,000
Surveillance and Monitoring	Conduct periodic program data validation	55,000	-	55,000	-	55,000	165,000
Surveillance and Monitoring	Conduct annual internal program review and planning	-	20,000	-	20,000	-	40,000
Surveillance and Monitoring	Integrated multiprogram supervisory visits	25,000	25,000	25,000	25,000	25,000	125,000
Surveillance and Monitoring	Routine data collection forms (MCMR and blood test registers)	61,000	-	61,000	-	52,000	174,000
Surveillance and Monitoring	Provincial Financial systems consultant	555,000	555,000	555,000	555,000	555,000	2,775,000

Case Management (NSP)	G6PD Test kits (elimination provinces	72,106	117,095	113,655	105,860	74,332	483,047
Case Management (NSP)	G6PD Test kits	72,106	117,095	113,655	105,860	74,332	483,047
Case Management (NSP)	Microscopes	100,000	-	-	-	-	100,000
Case Management (NSP)	Microscopy commodities (other)	56,788	59,627	62,609	65,739	69,026	313,790
Case Management (NSP)	RDT	22,813	21,961	23,563	19,508	12,231	100,076
Case Management (NSP)	Treatment Commodities	587,083	568,391	646,448	523,081	430,070	2,755,072
Enabling Environment	Boats and Vehicles	616,931	-	-	-	-	616,931
Enabling Environment	Commuications	17,000	-	-	-	-	17,000
Enabling Environment	Houses	578,563	-	-	-	-	578,563
Enabling Environment	Sheds	231,425	-	-	-	-	231,425
Vector Control	IRS Opeartional cost per cycle (casuals, accomodation, and fuel)		254,279	260,636	-	-	514,916
Vector Control	IRS Supervisor Training	3,500	3,500	-	-	-	7,000
Vector Control	Contracted HR support for IRS	1,780	1,825	1,870	-	-	5,475
Vector Control	Techncial field assistance for Vector Control (SSA)	50,400	51,660	52,952	-	-	155,012
Vector Control	TA (IRS expert)	60,000	61,500	63,038	-	-	184,538
Vector Control	IRS Equipment	-	26,442	16,266	-	-	42,708

Vector Control	IRS Insecticide	-	289,227	296,458	-	-	585,685
Vector Control	LLIN Distribution to HZ	905,219	236,753	242,672	1,033,685	268,437	2,686,767
BCC/IEC	LLIN Distribution to village/HH (including BCC/IEC)	1,357,829	355,130	364,008	1,550,528	402,656	4,030,150
BCC/IEC	Health Promotion (HP) Division will support Malaria program implementation by mobilizing provincial HP and Health Workers in community engagement and behavior change communication	256,220	101,228	101,228	253,595	101,780	814,051
Total							**19,125,060**