Republic of the Philippines

Department of Health

National Strategic Plan for the Control and Elimination of Malaria in the Philippines 2020-2022

Prepared by National Program for the Control and Elimination of Malaria of the Department of Health with the Collaboration of the World Health Organization and the Pilipinas Shell Foundation Inc.

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Foreword

Republic of the Philippines

Department of Health

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Foreword

The updated National Strategic Plan for the Control and Elimination of Malaria (NSPCEM) for 2020-2022 is a testament of the commitment of the government in achieving a malaria-free Philippines by 2030.

The 2020-2022 is a crucial period for the Malaria Program as it gears to eliminate malaria in the remaining three provinces with local transmission. The geographical extent of local transmission of malaria has been scaled down to 16 municipalities in 2019, and focal control measures have been placed to reduce the number of cases in these identified areas. The rest of the country must ensure that whatever gains have been achieved in their areas remain intact and protected in order to prevent re-establishment of malaria and to sustain zero indigenous cases.

The Department of Health urges every partner in the health sector, and every Local Government Unit to implement this 2020-2022 NSPCEM. Use it as reference and guide in pursuing strategic approaches and interventions to each area's need and situation.

Francisco T. Duque III, MD, MSc
Secretary
Department of Health
Republic of the Philippines

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The principles underpinning the updated Strategic Plan are based on the mid-term review (MTR) of the Strategic Plan for 2017-2022 conducted in late 2019. The findings of the MTR were discussed with stakeholders on November 11, 2019.

The drafting team consulted closely with the following members of the Malaria Program Technical Working Group (TWG):

- Dr. Raffy Deray, National NMCEP Manager
- Dr. Gawrie Galappaththy, World Health Organization (WHO)
- Ms. Marvi Trudeau, Pilipinas Shell Foundation, Inc. (PSFI)
- Dr. Fe Esperanza Espino, RITM
- Dr. Ferdinand Salazar, RITM
- Ms. Jennifer Luchavez, RITM
- Dr. Pilarita Rivera, University of the Philippines-College of Public Health (UP-CPH)
- Ms. Cecilia Hugo, Asian Collaborative Training Network for Malaria, Inc. (ACTMalaria)
- Mr. Oscar Macam, Regional MCEP Coordinator, CHD MiMaRoPa
- Mr. Suharto Akob, Key Affected Population – Mindanao
- Mr. Hamidon Monsarapa, Key Affected Population - Palawan

Regional Malaria Program Coordinators and other technical staff and partners were convened to validate the assessment and formulate their respective Strategic Plans as inputs to the NSPCEM 2020-2022.

Department of Health, Central Office

1. Dr. Myrna C. Cabotaje, Undersecretary of Health, Public Health Services Team
2. Dr. Napoleon L. Arevalo, Director IV, DPCB
3. Dr. Leda Hernandez, Division Chief, IDO
4. Dr. Raffy Deray, NMCEP Coordinator

Department of Health – Center for Health Development

1. Mr. Roy Fiaching, Regional Malaria Coordinator, CHD Cordillera Administrative Region (CAR)
2. Engr. Ashley Antonio, Regional Malaria Coordinator, CHD Ilocos Region
3. Dr. Romulo Turingan, Regional Malaria Coordinator, CHD Cagayan Valley Region
4. Mr. Joel Padilla, Regional Malaria Coordinator, CHD Central Luzon
5. Ms. Michelle Malawig, Regional Malaria Coordinator, CHD Calabarzon
6. Mr. Oscar Macam, Regional Malaria Coordinator, CHD Mimaropa
7. Mr. Jobal Bachiller, Regional Malaria Coordinator, CHD Bicol Region
8. Ms. Maria Lourdes Monegro, Regional Malaria Coordinator, CHD Western Visayas
9. Dr. Ronald Jarvik Buscato, Regional Malaria Coordinator, CHD Central Visayas

10. Mr. Leonido Olobia, Regional Malaria Coordinator, CHD Eastern Visayas
11. Mr. Solomon Perez, Regional Malaria Coordinator, CHD Zamboanga Peninsula
12. Ms. Gemma Uy, Regional Malaria Coordinator, CHD Northern Mindanao
13. Engr. Antonietta Ebol, Regional Malaria Coordinator, CHD Davao Region
14. Mr. Royfrextopher Boholst, Regional Malaria Coordinator, CHD SOCCSKSARGEN
15. Ms. Erna Cravajal, Regional Malaria Coordinator, CHD CARAGA
16. Dr. Sadaila Raki-in, Regional Malaria Coordinator, MOH-Bangsamoro Autonomous Region in Muslim Mindanao
17. Ms. Chimmy Dawn Aquino – CHD Metro Manila

Other Participants

1. Dr. Indra Vythilingam, Consultant
2. Mr. Ray Angluben, Deputy Program Manager, PSFI
3. Dr. Antonio Bautista, Deputy Program Manager, PSFi
4. Dr. Esther Sedano, Technical Writer, WHO
5. Ms. Maria Santa Portillo, OLMIS Coordinator, WHO
6. Ms. Kate Lopez, Surveillance, Monitoring and Evaluation Officer, PSFI
7. Mr. Al-Patrick Aquino, Nurse III, CHD Mimaropa
8. Mr. Richard Delos Reyes, Entomologist, CHD Mimaropa

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- Ms. Maris Emperado, PSFI
- Mr. Dominador Cabugayan, PSFI
- Ms. Norma Joson, Vector Control Specialist

Executive Summary

This National Strategic Plan continues to pursue the commitment of the Government of The Philippines to achieving malaria elimination by 2030 but recognizes that the National Malaria Program is not on track to meet its 2019 mid-term impact level targets. While the intended transition of provinces from control to elimination has been reached or even surpassed, the malaria problem in four high-endemic municipalities in southern Palawan has proven resilient to conventional control measures. Additionally, the data indicates a problem in the management of imported cases, where the proportion of severe cases and the case fatality rate are high.

The **goal** of this Strategic Plan for the period 2020-22 is:

By 2022, malaria transmission will have been interrupted in all provinces except Palawan, 75 provinces will have been declared malaria-free, and the number of indigenous malaria cases will be reduced to less than 1200, i.e. by at least 75% relative to 2018.

Among the impact targets, it is also foreseen that the number of malaria deaths, which has stood at 3-4 per year over the last five years will be reduced to zero. This will require particular attention to the management of imported malaria cases.

The plan takes a health system strengthening approach to malaria control and elimination and is aligned with the Philippines Health Agenda (PHA) and the principles of Fourmula One Plus. The strategies also accord with WHO' Global Technical Strategy for Malaria (GTS) and the WHO Western Pacific Regional Framework for malaria control and elimination.

The plan is structured by four major objectives, each of which covers several strategies, as follows.

Objective 1. Universal Access to prevention and case management

Ensuring universal access to malaria diagnosis, management and treatment services and appropriate preventive measures is differentiated based on the presence or absence of malaria transmission and according to special risk groups.

Strategy 1.1, Maintain and augment malaria interventions, applies to the four highly endemic municipalities of Palawan (Balabac, Bataraza, Brooke's Point and Rizal), where the annual number of malaria cases in a population of 230,000 has fluctuated around 5000 for the last five years. It also targets the remaining active foci in other municipalities in Palawan and in the provinces of Mindoro Occidental and Sultan Kudarat. There, universal coverage with case management and vector control will be implemented. In southern Palawan this will be reinforced with expansion, strengthening and new measures, the main ones being the following:

- Coverage of RDT Volunteer services will be expanded to cover the most remote, thinly populated communities;
- Adherence to treatment will be ensured through half-way houses staffed by volunteer field assistants and meals for the duration of treatment;

- LLINs will be delivered house-to-house, with IEC, and with conical nets for persons staying away from home for forest activities;
- Giant, communal LLINs will be set up at all marketplaces in the three highest burden municipalities to protect people staying there in the night, especially women and children;
- IRS will be conducted with a long-acting formulation of a non-pyrethroid to prevent further development of insecticide resistance;
- Every year, around November, when malaria prevalence is lowest, the three municipalities with highest burden will be covered by an active case detection round, where everybody will be tested for malaria with RDT and positives treated;
- Subject to research results on acceptability and entomological and epidemiological effect, a novel personal protection method, DEET-impregnated anklets and wristbands will be scaled up to provide supplementary protection for all people in the four high-burden municipalities.

Strategy 1.2, Prevention of re-establishment of transmission, through universal access to diagnosis and treatment, vigilance of general health services, including private, and vector control response capacity, will be implemented in all the provinces no longer reporting indigenous malaria cases (now 78/81). Provincial malaria elimination hubs, backed up by Centers for Health Development (CHDs), will have the main responsibility for implementation.

Strategy 1.3, Responsive malaria interventions among identified high-risk population groups, will be implemented to protect highly exposed mobile populations, military forces and others, through customized strategies often including screening for malaria parasitemia, IEC, and LLINs.

Strategy 1.4, Ensure that travelers to endemic countries and endemic areas in Philippines have access to information, chemoprophylaxis and personal protection, aims to protect travelers from the Philippines to endemic countries, especially Papua New Guinea and sub-Saharan Africa; as well as travelers from malaria-free areas to Palawan: It will include advice on protection against malaria and health-seeking upon return and ensure access to appropriate chemoprophylaxis. It will work with other DOH programs concerned with travelers' health especially Bureau of Quarantine and collaborate with other relevant sectors.

Objective 2. Governance and Human Resources

Strategy 2.1, Establish functional organizational structures and malaria work force at all levels, aims to ensure and maintain the right number and categories of personnel with relevant training at the DOH central (IDO) and CHDs, where technical expertise for the province-level Elimination Hubs is drawn from; Continued HR capacity development will be required to further strengthen all program components in Palawan and to better reorient towards the new main strategy of prevention of re-establishment of transmission in other provinces as well as the non-endemic municipalities of Palawan.

Strategy 2.2, Strengthen the policy environment, management systems and coordination mechanism in support of malaria elimination, is to ensure a supportive policy and management system encompassing malaria program planning (especially at the provincial level), a logistics management system, and training support mechanisms. For strengthening and maintenance of capacity, seven collaborating centers established at selected CHDs having teams of specialists in various malaria disciplines, play a key role.

Objective 3. Financing accelerated malaria control and elimination

Strategy 3.1, Secure adequate government and non-government financial resources in support of malaria control and elimination. While the Malaria Program currently benefits from funding assistance through the Global Fund, it recognizes that external project resources are likely to end sometime in the 2020s. The national budget for the Malaria Program has increased significantly in the past five years but sustaining funding and malaria operations at the local level remains challenging.

The strategy up to 2023 is to continue accessing external resources like the Global Fund for the four provinces (Mindoro Occidental, Palawan, Sulu and Sultan Kudarat) that reported transmission in 2018 and require intensive logistic and management support, while operations in all other provinces must be funded by the LGUs with augmentation from DOH through the CHDs. One exception to this is the continued procurement of major commodities by central DOH for distribution to provinces based on their needs.

Continued mobilization of resources will be sought through the DOH budget, LGUs and non-government channels. This will require advocacy to local chief executives and officials in charge of LGU planning and budget management.

Objective 4. Regulation, Quality Assurance, Use of data and information and Performance Accountability

Strategy 4.1, Ensure high quality malaria diagnosis and treatment, through effective quality assurance systems, will maintain the advances of recent years in providing external quality assurance for malaria microscopy at regional, provincial and municipality levels; also, a new scheme for quality assurance for RDTs will be developed. The quality of treatment is monitored through the malaria surveillance system that provides details of medicines and dosages given as well as parasitological follow-up.

Strategy 4.2, Improve and maintain high quality and effective vector control measures includes bioassay testing, insecticide susceptibility monitoring and vector surveillance in selected sites at regular intervals depending on the malaria situation.

Strategy 4.3, Strengthen malaria case surveillance and response systems in support of malaria elimination, according to the Malaria Surveillance and Response Strategy includes elimination surveillance according to the now well-established 1-3-5 system (case notification within 1 day, case investigation within 3, and focus investigation and initiation of response, within 5 days).

Strategy 4.4, Maintain effective Malaria Program monitoring and evaluation systems is supported by the comprehensive OLMIS online information system for malaria, which includes all information on malaria cases as well as focus investigation and all main operational data, for example on case detection and vector control. This system is now being rolled out to all provinces in the country. It will be set up to communicate with other surveillance systems such as PIDSR, so that there will be only one channel for communicating malaria surveillance data.

Monitoring and evaluation will also be strengthened by updating monitoring for vector control based on the recommendations of the recent MTR. For each of the strategies mentioned here,

several indicators have been developed and the methods for collection of the indicator data have been defined. This will ensure performance accountability at central regional and provincial levels of the national program and of the Global Fund Principal Recipient, PSFI.

Strategy 4.5, a research agenda in support of the plan's goal encompasses several essential studies including:

- Assessment of the community acceptability of a long-acting formulation of an organophosphate
- Assessment of DEET impregnated anklets and wristbands
- Longitudinal entomological study of biting and resting habits of different vectors in a deep forest and a forest fringe site in southern Palawan
- "Bednet" Utilization Surveys (BUS) every two years in the high-endemic municipalities in southern Palawan
- Community sample surveys with highly sensitive techniques in selected provinces, where malaria has apparently been recently eliminated
- Study on the epidemiology of *P.knowlesi* in Palawan

Abbreviations

ACD	Active Case Detection
ACT	Artemisinin Combination Therapy
AL	Artemether-Lumefantrine
AOPH	Annual Operation Plan for Health
BHS	Barangay Health Stations
BMMC	Barangay Malaria Microscopy Center
CHD	Center for Health Development (DOH Regional Office)
CPG	Clinical Practice Guidelines
DMU	Data Monitoring Unit
DOH	Department of Health
DOH-NMCEP	Department of Health – National Malaria Control and Elimination Program
DRU	Disease Reporting Unit
ECAMM	External Competency Assessment of Malaria Microscopists
EMR	Electronic Medical Record
ESR	Event-based Surveillance and Response
FHSIS	Field Health Services Information System
GIDA	Geographically Isolated and Disadvantaged Area
GF	The Global Fund to Fight AIDS, Tuberculosis and Malaria
HUC	Highly Urbanized Cities
ICC	Independent Component Cities

IDP	Internally Displaced Population
IP	Indigenous People/Population
IRS	In-door Residual Spraying
KMITS	Knowledge Management and Information Technology Service
LCE	Local Chief Executive
LGU	Local Government Units
LLIN	Long-Lasting Insecticidal Net
LMIS	Logistic Management Information System
MOP	Manual of Procedures
MTR	Mid-term Review
M & E	Monitoring and evaluation
NCAMM	National Competency Assessment of Malaria Microscopists
NCIP	National Commission on Indigenous People
NOSIRS	National Online Stock Inventory Reporting System
NSP	National Strategic Plan
OFW	Overseas Filipino Workers
OLMIS	Online Malaria Information System
OWWA	Overseas Workers Welfare Administration of Department of Labour and Employment
PCD	Passive Case Detection
Pf	*Plasmodium falciparum*
PQ	Primaquine
Pv	*Plasmodium vivax*
QAS	Quality Assurance System
PhilMIS	Philippine Malaria Information System
PIPH	Provincial Investment Plan for Health
PIDSR	Philippine Integrated Disease Surveillance and Response
PIPH	Provincial Investment Plans for Health
PSFI	Pilipinas Shell Foundation, Inc.
RHU	Rural Health Units
TWG	Technical Working Group
UHC	Universal Health Coverage
WHO	World Health Organization

Background

The previous strategic plan for malaria control and elimination in the Philippines covered the period 2017 to 2022. Since it was prepared, the epidemiological situation has changed. On the background of rapid progress in freeing up large areas from malaria, the strategy in Luzon and Mindanao needs to be oriented more strongly towards prevention of re-establishment of transmission. In contrast, despite a multi-pronged attack, it has proven difficult to reduce the malaria burden in a highly endemic area in Palawan, and there is a need to identify a more intense strategy adapted to local conditions there. To support strategic revision, the Department of Health decided to conduct a joint Mid-term Review (MTR) of the national malaria program with special attention to southern Palawan. This took place in November 2019, and its findings[1] inform the present revised strategic plan.

The mid-term review and the revision of strategy have also become necessary because of the financial situation of the program. Currently the Philippines receives about 10.6 million USD for malaria control and elimination from the Global Fund (GF) for the years 2018-2020. The national program intends to submit a new funding request to GF for 2021-2023 in March 2020 aligned with the next GF funding cycle. The plan presented here will therefore include targets and activities up to and including 2023.

Country Profile

The Philippines comprises of 16 administrative regions plus one autonomous region (Bangsamoro Autonomous Region of Muslim Mindanao, BARMM), 81 provinces, 147 component cities and 17 chartered cities (Table 1). In 2018, the population reached 106.7 million and it is estimated to grow by 1.95% per year. The population comprises multiple ethnic groups, several of which reside in remote, hard-to-reach mountainous areas, where it is difficult to ensure access to health services.

For details on economy, social conditions, environment and climate, please refer to the last full Malaria Program Review (2013). In the following, the national health system will be reviewed in some detail, as it is undergoing major reforms.

Table 1. Number of provinces, cities, municipalities, barangays, by region in the Philippines, 2019. Source: National Statistical Coordination Board

REGION	PRO-VINCES	CITIES	MUNICIPALI-TIES	BARAN-GAYS
Bangsamoro Autonomous Region in Muslim Mindanao (BARMM)	5	2	116	2,490
Cordillera Administrative Region (CAR)	6	2	75	1,177

[1] Schapira, A., Vythilingam, I. et al. Report of the Midterm Review of The Philippines National Program for the Control and Elimination of Malaria 2017-2022. Department of Health and WHO Representative Office in the Philippines, Manila, 2019. Available from WHO

National Capital Region (NCR)	0	16	1	1,710
Region 1 (Ilocos Region)	4	9	116	3,267
Region 2 (Cagayan Valley)	5	4	89	2,311
Region 3 (Central Luzon)	7	14	116	3,102
Region 4A (CALABARZON)	5	19	123	4,019
Region 4B (MIMAROPA)	5	2	71	1,460
Region 5 (Bicol Region)	6	7	107	3,471
Region 6 (Western Visayas)	6	16	117	4,051
Region 7 (Central Visayas)	4	16	116	3,003
Region 8 (Eastern Visayas)	6	7	136	4,390
Region 9 (Zamboanga Peninsula)	3	5	67	1,904
Region 10 (Northern Mindanao)	5	9	84	2,022
Region 11 (Davao Region)	5	6	43	1,162
Region 12 (SOCCSKSARGEN)	4	5	45	1,195
Region 13 (CARAGA)	5	6	67	1,311
TOTAL	**81**	**145**	**1,489**	**42,045**

The Philippine Health System

Health Financing including Social Health Insurance

The World Bank classifies the Philippines as a lower-middle income country, based on the gross national income per capita of USD 3,550 in 2015. This places the country in the upper band of lower-middle income countries, which entails a minimum 50% co-financing for Global Fund grants. However, the Philippines is on track to become an upper-middle income country by 2019.

The Sin Tax Reform Law of 2012, which imposes an increased excise on tobacco and alcohol products has greatly boosted health financing, as its revenues, which stood at PHP 139.3 billion in 2016, are directed to public health programs and subsidization of social health insurance for the poorest (see below). The sin tax scheme allowed a growth of health expenditures from about 381 billion pesos in 2010 to 655 billion pesos in 2016.

Annual health expenditure per capita was USD 135 in 2015, or about 4.9% of GDP – similar to many neighboring Asian countries, and an increase from 4.1% of GDP in 2010.

The National Health Insurance Program Law of 1995 introduced a social health insurance scheme, *PhilHealth*, which reached 92.0% coverage in 2015 (PhilHealth Statistics Database). *PhilHealth* now covers 66 million active members (91 % of target in 2016) through a network of accredited hospitals and health centers.

Devolution and Health Sector Reform

The Philippines has a decentralized health system led by the Department of Health (DOH) and implemented by the Local Government Units (LGUs) as mandated under the 1991 Local Government Code. The provinces operate provincial and district hospitals, the municipalities run rural health units (RHUs) and barangay health stations (BHSs), and the highly urbanized cities manage their own health facilities (Table 2).

The purpose of devolution was to align resources with local needs and demands, while promoting increased accountability of LGUs and greater local participation in decision-making.

However, it led to fragmentation and reduction of equity related to highly variable commitment of LGUs. The loss of central administrative control also made it more difficult to provide technical supervision of public health programs and service delivery standards, to maintain health information systems (HIS), and to implement national health policies.[2]

In response to the challenges brought about by devolution and the National Health Insurance Act of 1995, the DOH developed in 1999 the Health Sector Reform Agenda (HSRA) as the policy framework for reforms. This led to the adoption of the FOURmula One (F1) for Health as the implementing framework for health reforms for 2005—2010. F1 for Health established four major pillars, namely, financing, service delivery, regulation and governance, as a single package of targeted reforms. It has established a mechanism for centrally funded grants to promote inter-LGU planning, formation of Inter-local Health Zones, and Provincial Investment Plans for Health (PIPH), which enable LGUs to access pooled donor funds via a Sector-wide Approach.

Building on the F1, the DOH adopted Universal Health Care or *Kalusugang Pangkalahatan* (KP) as its strategic framework for 2011-2016. KP expanded the National Health Insurance Program and intensified investments in health infrastructure. KP also made it possible to deploy centrally contracted health staff to augment local human resources, and to undertake central procurement of previously locally managed commodities.

Despite the increase in health expenditures, and early reforms, improvement of health outcomes has been marginal, for example concerning infant mortality rate and vaccination coverage, which even decreased to 69.9 % in 2017 against 79.5 % in 2008.

Access to health care has remained a challenge. Most hospitals in the Philippines are private and most of their services are not affordable for the poor despite subsidization through *PhilHealth*. Of the Filipinos who sought medical advice or treatment in 2013, about two-thirds (64.5%) went to public health facilities and almost all of the other one-third (33.1%) went to private or non-government health facilities.[3] Despite *Philhealth*, 51.0% of health service costs continued to be financed by out-of-pocket spending in 2015.

In 2018, the Philippines adopted the Universal Health Care (UHC) Act (Republic Act 11223). It stipulates automatic inclusion of every citizen in *PhilHealth* insurance and intends to give Filipinos immediate access to population-based and individual-based health services, where DOH and LGUs are responsible for population-based services and *PhilHealth* for individual-based services. The act consolidates the providers into provincial-wide and city-wide health systems with clinical, financial, and management integration.

Furthermore, a DOH administrative order in 2018 has established a medium-term strategic framework for 2017—2022, FOURmula One Plus for Health or F1+, which expands the four pillars of health reforms included in F1, placing greater emphasis on performance accountability. In relation to malaria control and elimination, the following elements of F1+ are particularly important:

- A unified, transparent and explicit process of identifying priority programs with a focus on basic and essential primary care services;
- Health services and programs for the poor, marginalized and vulnerable;

[2] UPecon-Health Policy Development Program (2016) *The Challenge of Reaching the Poor with a Continuum of Care: A 25-Year Assessment of Philippine Health Sector Performance*

[3] National Demographic Health Survey, 2013

- Engaging pharmacies to provide selected essential medicines to specific population groups under a revitalized *Botika ng Bayan* program;
- Capacitating local health centers to ensure access to basic laboratory services and clinical practice guidelines;
- Public and private providers shall be organized into SDNs that will be responsible for the health needs of a defined population, including GIDAs;
- All families and individuals shall be assigned to a primary care provider in the Health Care Provider Network (HCPN).[4]

Human Resources for Health

- A continuing exodus of health workers limits provision of and access to essential care. To date, there are still barangays without midwives, and health facilities continue to experience fast turnover of health personnel.
- A DOH Health Human Resource Development Bureau Study in 2005 suggested that the existing number of doctors and midwives positions may have met the country's total requirements but this did not guarantee even access to services for the population because: (a) not all available positions are filled; (b) although positions may have been filled, some are not used to perform expected health functions; and (c) deployment is inequitable *vis-à-vis* the number of clients and the geographic spread of their catchment population.
- Despite increased health financing thanks to the so-called sin tax and measures to correct the negative effects of devolution, the DOH at central level is seriously understaffed; this affects the quality of planning and formulation of policies.

Table 2. Number of health facilities by region in the Philippines, 2019. Source: National Health Facility Registry.

REGION	BHS	RHU	CHO	Infirmaries	Birthing Homes	Hospitals
Bangsamoro Autonomous Region in Muslim Mindanao (BARMM)	630	128	0	20	147	28
Cordillera Administrative Region (CAR)	910	100	0	29	8	32
National Capital Region (NCR)	18	499	0	26	87	209
Region 1 (Ilocos Region)	1,788	152	0	41	62	91
Region 2 (Cagayan Valley)	1,434	97	0	38	98	66
Region 3 (Central Luzon)	2,063	283	3	46	278	198
Region 4A (CALABARZON)	2,791	228	2	36	348	258
Region 4B (MIMAROPA)	1,155	81	0	31	0	37
Region 5 (Bicol Region)	1,495	129	2	62	125	65
Region 6 (Western Visayas)	1,957	144	0	32	33	66
Region 7 (Central Visayas)	2,206	160	2	47	0	68
Region 8 (Eastern Visayas)	924	168	1	41	200	49
Region 9 (Zamboanga Peninsula)	778	97	0	30	96	44
Region 10 (Northern Mindanao)	1,252	121	0	40	71	75
Region 11 (Davao Region)	1,188	68	0	63	112	68

[4] DOH Administrative order 2018-0014. Strategic Framework and Implementing Guidelines for *FOUR*mula One Plus for Health (F1+)

Region 12 (SOCCSKSARGEN)	1,172	62	0	63	140	66
Region 13 (CARAGA)	754	81	28	7	36	55
TOTAL	**22,515**	**2,598**	**38**	**652**	**1,841**	**1,475**

The National Malaria Control and Elimination Program

Overview

At the 10th East Asia Summit held in Malaysia in November 2015, the Philippines was one of 18 ASEAN member and observer countries to endorse the Asia-Pacific Leaders Malaria Alliance Malaria Elimination Roadmap aiming for malaria to be eliminated from the region by 2030.[5] Many areas of the country approach or have achieved elimination, the above indicators will need to be revised to more precisely monitor progress towards the national and regional malaria elimination goal.

The delivery of anti-malarial services is a shared responsibility between the national and local government. The national government, through the DOH, sets the program's policies, standards and guidelines, provides training, augments the logistic and financial requirements of LGUs for anti-malaria services, establishes and operates quality assurance for microscopy, treatment and vector control measures, designs health promotion materials and other approaches, and conducts regular monitoring and evaluation. Global Fund support for the program is channelled through the *Pilipinas Shell Foundation Inc.* as the principal recipient. Presently, eight provinces (which still have or until recently had, malaria transmission) are targeted by GF support. Part of the GF support is channelled through the WHO country office in the Philippines and used mainly for technical staff, training and consultancies. PSFI has a presence with technical and administrative staff in the GF target provinces, particularly so, in Palawan.

The malaria burden has decreased from the more than 100,000 cases per year in the 1980s to the present annual figure of around 5000 (Figure 1, Figure 2). In 2019, until mid-November, indigenous (locally transmitted) malaria cases had been reported from only three out of the Republic's 81 provinces, namely Palawan, Sultan Kudarat and Mindoro Occidental.

[5] APLMA (2015) *Asia Pacific Leaders Malaria Alliance Malaria Elimination Roadmap*

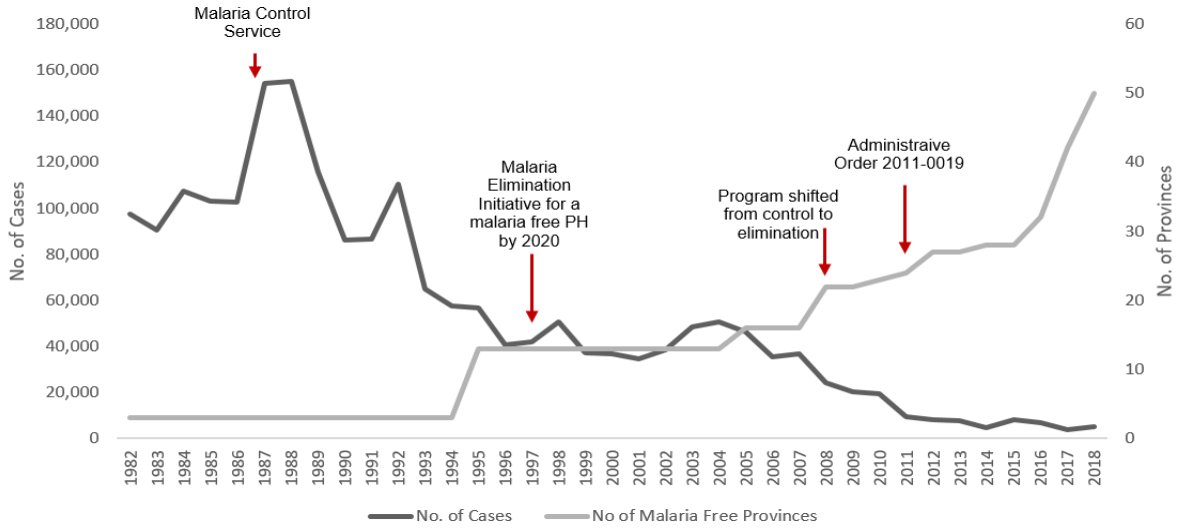
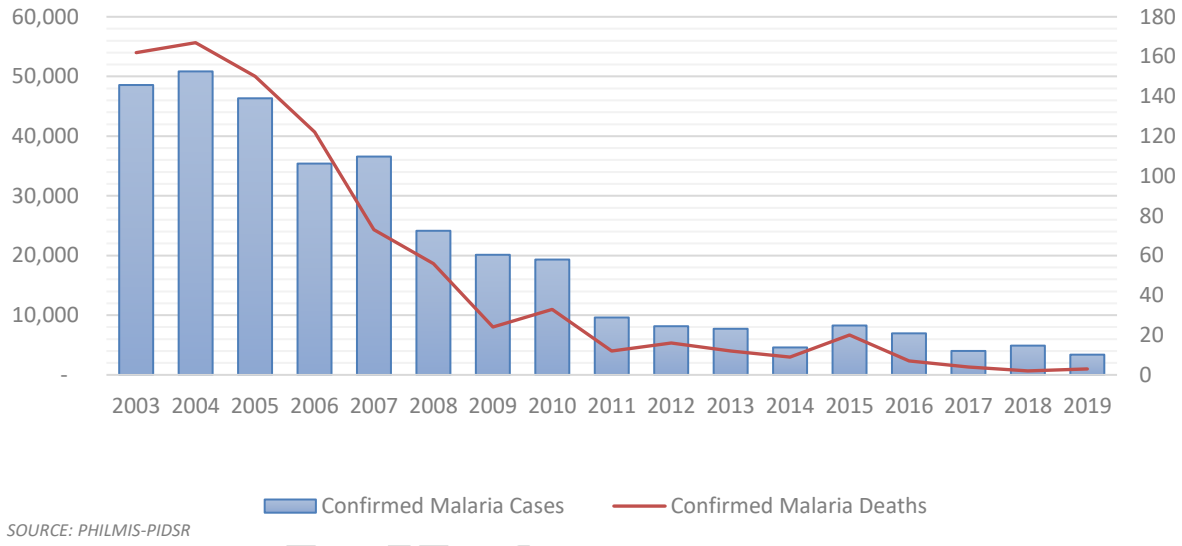


Figure 1. Philippine progress in malaria burden reduction and elimination.



SOURCE: PHILMIS-PIDSR

Figure 2. Confirmed malaria cases and deaths, Philippines, 2003-2019.

Mid-term Program Review conclusions concerning program impact and present epidemiological situation

The remaining malaria foci in the country outside Palawan have now been eliminated or are close to being eliminated. The number of provinces reporting zero malaria cases has increased from 71 in 2016 to 78 in 2019. The number of provinces declared malaria-free after rigorous scrutiny at the same time increased from 36 to 50 (Fig. 3).

One striking finding in the review is that case management in the provinces with no indigenous cases (declared malaria-free or not) is not satisfactory. Among internationally imported cases, the proportions that were severe and dies were much higher than among indigenous cases.

The rates are quite low in Palawan indicating adequate case management services despite the heavy burden. In contrast, the very high proportion of cases classified as severe among the imported cases suggests that care-seeking is delayed and/or case management is inadequate (Table 3).

In the southern part of Palawan, there are four highly endemic municipalities with a total population of 250,000 (2018) and a malaria caseload, which has fluctuated between 3000 and 7000 (API about 20/1000) over the last 5 years. Most of the cases are in school-age children and younger children[6], which indicates that there must be a large reservoir of asymptomatic infections in adults. Most of the affected persons are indigenous people, who have until a few years ago hardly had any contact with modern health services. Resurgences in these four municipalities in 2015-16 and again in 2018-19 have coincided with unusually low rainfall. The most likely explanation is that the rainfall deficit makes farming in lowland areas difficult, while it is still possible to farm or gather edible crops in the higher, more densely forested ranges, where vector density is higher. This suggests that the key to addressing the malaria problem among these people is in providing alternative sources of livelihood apart from *kaingin* farming

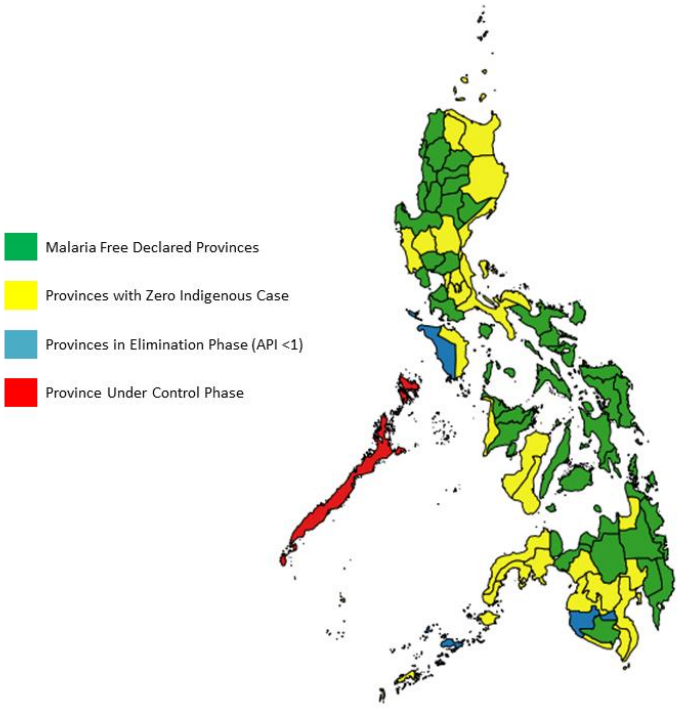


Fig. 3. Provinces declared malaria-free, provinces with zero indigenous cases, provinces in elimination phase (Sultan Kudarat and Mindoro Occidental each with < 10 indigenous cases in 2019) and one province, Palawan, still with endemic malaria

[6] Midterm-Review Report 2019: Fig. 14

Table 3. Number of indigenous and internationally imported malaria cases, severe cases and malaria deaths in Philippines 2016-2019

Year	Indigenous				Imported - International			
	All	Severe	% severe	Deaths	All	Severe	% severe	Deaths
2016	6847	370	5.4%		47	2	4.3%	
2017	3886	77	2.0%		74	11	**14.9 %**	
2018	4807	84	1.7%	5 (CFR 0.05%)	81	10	**12.3 %**	**6 (CFR 3.2%)**
Jan-June 2019	3354	86	2.6%		27	3	**11.1 %**	

In the other municipalities of Palawan, the malaria caseloads are small to moderate and it should be possible to eliminate malaria there within a few years (Fig. 4).

The mid-term review 2019 noted the importance of outdoor-biting in southern Palawan affecting adults as well as children according to entomological and social studies, but also noted the paucity of entomological data in particular the absence of longitudinal studies, which could correlate vector data with climate and agricultural calendar (Section 5.2.1). The Review took note of the findings from a thorough "Bednet utilization survey" conducted in 2019, which included following recommendations based on a combination of operational and anthropological observations:

1. Supplement center-based bednet distribution with house-to-house distribution in remote areas; and while there, ensure that everyone knows how to hang mosquito nets, monitor the adequacy of bednets, and provide information about malaria.
2. Make bednets available for common use in communal areas (such as taboan (market) or baile areas. This recommendation is being implemented (Fig. 7)
4. Consider distributing mats with bednets
5. Strengthen face-to-face information campaigns

In relation to the combined use of LLINs and IRS and the role of pro-active case detection, the review recommendation was informed by WHO policies, a modelling study concerning malaria in southern Palawan[7] and the recent finding of incipient pyrethroid resistance in malaria vectors, including in Palawan.

[7] Briët O & Schapira A (2016). Modelling to support the planning of malaria elimination in southern Palawan, the Philippines. Swiss Tropical and Public Health Institute, Ref. no. 1231

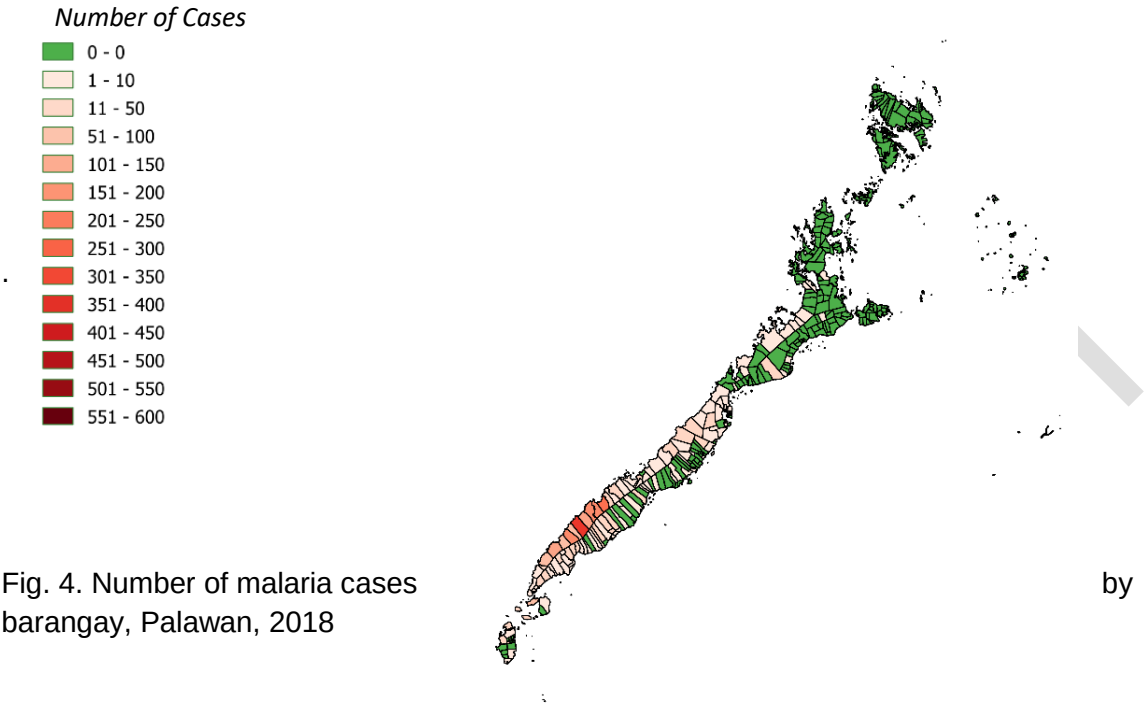


Fig. 4. Number of malaria cases by barangay, Palawan, 2018

Recommendations of the 2019 Mid-term Review

The program is described and analyzed in the Report of the 2019 Mid-Term Review. Below are the recommendations of the Review by thematic area.

Revision of strategic planning and M&E framework

It is amply clear that all of the country except for southern Palawan is marching rapidly and steadily towards a situation of no indigenous malaria, while for the four municipalities of southern Palawan, it will take several years to reduce the burden to a level, where it is rational to apply a true elimination strategy, meaning one applying a customized, intense elimination strategy to each small, discrete focus. It will therefore be most rational and practical to structure the malaria program according to these two major strata. In this framework, most epidemiological and operational indicators would be kept separate for the two strata.

Prevention of re-establishment of malaria transmission

Preventing re-establishment of transmission[8] in a malaria-free area encompasses:

[8] WHO now places emphasis on "prevention of re-establishment of malaria transmission" rather than "prevention of reintroduction of malaria", because the latter concept includes introduced cases, i.e. the first generation progeny of imported cases, which may be very difficult to prevent entirely (WHO (2017) A framework for malaria elimination).

1. Preventing travelers from the country visiting endemic countries from being infected and bringing back the disease to a malaria-free area through promotion of prophylaxis and personal protection.
2. Early detection of any malaria infection in a person entering the malaria-free area by: screening and/or by educating for appropriate health seeking behaviour
3. Ensuring that any suspected malaria cases is recognized at the primary level of care and then rapidly diagnosed, treated and reported (vigilance of the general health services).
4. Conducting a case and focus investigation, when an imported case is found in a potentially receptive area (1-3-5 strategy)

Re 1. Chemoprophylaxis and personal protection

The NMCEP should set up a sub-program to ensure that travelers to Africa and PNG are advised about chemoprophylaxis and personal protection and that the required medicines are easily available and affordable for potential travelers. The opportunity can be used to encourage proper health-seeking in case of fever after return, i.e. rapidly seeking medical care and mentioning travel history. Details of the strategy needs to be worked out by the program in collaboration with Burau of Quarantine, Philippine Overseas Employment Administration (POEA) pharmacies, travel and tourism companies and others. This is a demaning task, akin to a sub-program, and it must be led by a medical doctor.

Re 2. Early detection and appropriate health-seeking behaviour

Here the program is already developing excellent efforts by screening and education high risk groups. The education of OFWs is probably best integrated under 1.

Re 3. Vigilance of general health services.

The provincial elimination hubs are in a perfect position to work with each province Primary Health Care Provider Network to ensure that all primary health care providers recognize suspected malaria, know where to obtain diagnosis and treatment, and immediately report. However, this work can be more efficient by the issuance of short clear guidelines from central level. At present, there are on average six sites per province, where quality assured microscopy is available. If treatment is also there, this might be sufficient for many provinces, but it is the responsibility of each elimination hub to ensure that a diagnostic test can be performed within a maximum of two hours after a primary provider has recognized a case of suspected malaria. Thus, there may be a need for additional sites in some provinces. If so, the expansion should not be through microscopy which in the long term will be costly to maintain with quality assurance, but through deployment of RDT kits with annual replacement. As primary care providers may encounter various difficulties in the management of such cases, there should be a hotline telephone number for assistance day and night in each province.

Re 4. 1-3-5-strategy.

This is already implemented.

Reduction of the malaria burden in southern Palawan

The malaria case load in the four southernmost municipalities of Palawan (Balabac, Bataraza, Brooke's Point and Rizal) has not been reduced between 2014 and 2019. This places the goal of national malaria elimination by 2030 in jeopardy.

The proposed additional strategies are:

- A non-pyrethroid insecticide for IRS, which in addition to controlling resistance should offer the advantages of stronger insecticidal effect as opposed to the typical mixed killing and repellant action of pyrethroids
- IRS round carried out within one month with optimal timing (February) - additional locally recruited spraymen
- Giant communal LLINs at marketplaces
- Conical LLINs for forest-goers
- Chemical larviciding at streams near marketplaces (subject to DENR approval)
- Novel personal protection measures, especially DEET impregnated ankle and wrist bands, if validated by field research, or, pyrethroid-impregnation of *malongs*, large cylindrical skirts also used for carrying babies, but this would require a study on safety.
- Mapping of all households to ensure highest possible coverage of curative and preventive services, especially RDT volunteers
- LLIN delivery directly to households and education with demonstration on hanging nets
- Enhanced health care with education through halfway houses transformed to health post
- Additional measures that may be identified after longitudinal entomological studies
- Annual round of mass blood survey with treatment around November, when transmission is lowest
- Mapping of all households and population in the three high-burden municipalities as support for IRS, LLIN distribution and mass blood survey

None of these interventions is as a game-changer comparable to IRS or LLIN in an area with indoor transmission. However, acting on different parts of the transmission cycle, if well carried out, they could have a significant impact. Optimistically, they could double the annual rate of decrease. Social and economic development, especially the creation of job opportunities could further help. Development of the area will also lead to better accessibility of the health staff to the IPs and vice versa.

Conclusion

Applying a broad array of supplementary strategies, improving LLIN and IRS operations, expanding RDT posts to underserved sub-populations, and assuming increased social and economic development in southern Palawan, it should be possible to envisage that a caseload of less than 1000 could be achieved by 2025. From then on, a further enhanced strategy corresponding to the program's 1-3-5 case and focus operations possibly supplemented with focal mass drug administration could lead to 0 malaria cases in southern Palawan before 2030

Program management

- As recommended already in the program reviews in 2013 and 2016, DOH should assume responsibility for adequate program staff at central level, rather than relying on the support from partners. As will be justified later, it is urgent to allocate sufficient funds to hire a senior, highly experienced entomologist or possibly sanitary engineer to strengthen the vector control component of the program.
- Procurement of major supplies such as LLINs, RDTs, and supplies and equipment for IRS, should be centralized to ensure compliance with policies, cost savings, quality, and continuity.

Vector control and entomology

- IRS, when combined with LLIN should be with an insecticide with a different mode of action. This is a WHO recommendation, and it was recommended by the previous mid-term review. Given the incipient resistance detected, the use of IRS with a different class of insecticide (organophosphate, carbamate, or neonicotinoid) is an appropriate strategy to ensure that resistance does not develop further in addition to providing added impact. A small trial with one or two alternative products to cover 1-2 barangays should be undertaken in early 2020 in Palawan. Based on acceptability, early bio-assay results, price and documentation, one of these should be selected and used from 2021.
- M&E for IRS should be updated in line with international recommendations to include for example, reporting on volumes of insecticides used and on post-spraying supervision.
- Especially in Palawan, recruit and train additional spray personnel to ensure that the spray round in the endemic areas can be completed within one month, February.
- Train a group of people (RDT volunteers, field assistants, spraymen, other volunteers) in good LLIN hanging practice, maintenance and care and deploy them for LLIN distribution. As much as possible, ensure that LLIN distribution is done house to house rather than by mass activities. Also demonstrate good LLIN practices in half-way houses.
- Initiate a project for trying out several novel anti-vector methods with initial evaluation based only on acceptability to the users and entomological assessment; subsequently, for promising tools, epidemiological evaluation based on controlled trial, or more likely, stepped wedge design, can be considered:
    - Procure a batch of e.g. 400 conical LLINs for forest goers in Palawan, assess their popularity by focus group discussions at demonstrations and later after distribution. Then decide on scale-up.
    - Likewise, after due preparation through laboratory trials and ascertainment of safety, conduct a field trial of repellent (DEET) treated wrist bands and anklets,
    - Scale up the giant mosquito nets now introduced at marketplaces and monitor their use and popularity
    - An additional intervention would be to cover streams close to marketplaces (*An. flavirostris* flight distance) with slow release temephos (larvicide). This should be done initially as a trial with evaluation based on assessment adult vector density or biting. However, this would require prior approval from the Department of Environment and National Resources. Alternatively, it would be possible to do stream-clearing, a traditional practice for malaria control in the Philippines, but unfortunately, it is not supported by evidence.[9]
- A descriptive, longitudinal entomological study to assess vector bionomics over at least one year with correlation to rainfall and agricultural cycle should be carried out. This, together with the above trials will require the placement of a qualified, experienced entomologist for two years in Palawan, possibly with international recruitment.
- For areas with no malaria transmission, it should be considered that LLINs have a long shelf-life, and that they can often be deployed more rapidly than IRS. Small outbreaks of malaria can be expected sooner or later somewhere. The initial vector control

[9] Foley DH et al. Stream-bank shade and larval distribution of the Philippine malaria vector, *An. flavirostris*. *Medical and Veterinary Entomology,* 2002, 16, 347-55

should normally be with LLINs. It will often be reasonable to add IRS, which should be done with a non-pyrethroid insecticide.

Diagnostic services and case management

- In southern Palawan, where some highly endemic areas are thinly populated, there is room for improvement of service density by adding more RDT volunteers. This must be based on mapping, and the additional number needed is not high.
- To assess lack of patient adherence, the most rational follow-up is for cases treated on the basis of RDT diagnosis is to follow up with microscopy only on Day 14 after start of treatment. Earlier follow-up will have very low sensitivity, while later follow-up (Day 21, 28) will be contaminated by reinfection.
- In contrast, for imported cases and the few indigenous cases in non-endemic areas, it is important to assess susceptibility by follow-up with slides on Days 0, 3, 7 and 28. Doctors in Palawan need to be alerted to the need for care in follow-up of any patient bringing Pf malaria from continental Southeast Asia (Cambodia, Laos, Myanmar, Thailand and Vietnam), as the spread of artemisinin-resistant malaria in Palawan could be a disaster.
- The half-way houses which have been set up to follow malaria patients to ensure adherence is a big expenditure for something that should normally be addressed by patient education, but it seems well accepted (free meals!), and in these thinly populated areas, the facilities could gradually become health posts to provide general health services not least health education on malaria.
- The half-way houses with their field assistants can also provide a convenient facility to assess the safety of primaquine 14 day treatment in patients in southern Palawan, which is very likely to have a high prevalence of G6PD deficiency
- The next TES studies should include a candidate second-line treatment (artesunate-pyronaridine seems the best candidate), and also a candidate medicine for mass drug administration (dihydroartemisinin-piperaquine seems the best candidate).

The issues concerning case management access in provinces with 0 indigenous malaria cases will be addressed below under Prevention of re-establishment of malaria transmission.

Surveillance, and M&E

- Make malaria a category 1 notifiable disease (immediate) except in southern Palawan
- Introduce in OLMIS a three-way distinction for all data collection: PCD, ACD, MBS (mass blood survey).
- Introduce vigilance of the general health services as the fundamental element of malaria surveillance in provinces with 0 indigenous malaria cases – see also: Prevention of re-establishment of malaria transmission.

Communication and social mobilization

- Generally, IEC activities should be planned, designed and implemented at province/regional level rather than at national level.
- Strengthening IEC in southern Palawan must be undertaken with great care, in consultation with local leaders, with their involvement and, where new personal protection measures are piloted, combined with action – research schemes.

Research

- The malaria program should draft a research agenda based on its needs included those identified in this report. This agenda should then be discussed in a meeting with academic members of the TWG and other relevant research partners to match needs with funding and human and technological resources.
- Priority subjects for inclusion in this plan would be study of the entomological and epidemiological effectiveness of DEET impregnated anklets and wrist-bands, and longitudinal study of vector bionomics in forest and forest fringe areas in southern Palawan, study of the epidemiology of P. knowlesi in Palawan and TES studies to assess therapeutic efficacy of current 1st line treatment, potential 2nd line treatment and a candidate treatment for mass drug administration.

Future Directions

The NSPCEM mid-term review brought to light two major impact targets which the program failed to deliver according to schedule. The first is the inability to reduce the number of locally transmitted cases in four municipalities of southern Palawan as scheduled despite a significant reduction in the number of barangays reporting transmission. The second is the gradual but steadily increasing number of imported cases and the ability to investigate the cases as per the national malaria surveillance protocol (1-3-5).

The more immediate concern is the reduction in cases in Palawan since this relates directly to the goal of reaching malaria-free country status.

To summarize, 97% of malaria cases in the country come from Palawan and 87% of these come from four municipalities, Balabac, Bataraza, Brooke's Point, and Rizal. Despite increase in cases in Palawan, the number of municipalities reporting cases has reduced from 42 to 11; and number of barangays from 186 to 82 (2016-mid 2019).

88% of cases in Palawan are *Plasmodium falciparum* which would seem to indicate that active transmission remains a problem for these municipalities, 84% of cases are among the indigenous people population, 39% among the working age group and 56% among men. 80% of cases are directly or indirectly associated with the forest either as permanent or temporary dwelling, or as a source of income.1.8% of all cases are classified as severe.1, 700 + individuals had more than one malaria infection in the last 3 years (2016-2018)

Despite the 90% reduction in the last 12 years, the plateau in trend from the past 3 years has been linked with (a) less than 90% distribution coverage of LLIN with an annual attrition rate ranging from 12-17% per year on LLINs, (b) questionable in-door residual spraying operations with a suggestion of a beginning resistance to pyrethroids, (c) adherence to the national treatment protocol is recorded at 87% in 2018, and (d) there is no credible data on the adherence of patients to treatment prescription.

The primary cause of the problem for these areas remain the relative inability of the local health systems to deliver malaria services at a more regular and timely frequency. Given that these areas are classified as geographically isolated and depressed areas and the population involved

are semi-nomadic, with little education and with means of income directly associated with the forest.

Health manpower to population per area ratio is largely inadequate which severely limits the regular delivery of health care services in general. Malaria care services specifically are highly reliant on outreach-based, active delivery using community-based volunteers and paid personnel to deliver malaria care packages. Halfway houses were also built to provide temporary shelters where malaria diagnostic and treatment services can be delivered under observation.

For the moment, the provincial and local government are fast-tracking the plan to build established IP villages/communities which will somehow soon, solve the problem of taking the IPs from the forest fringes. Until that time comes when everything will come to fruition.

Until that time comes and with the objective of reducing cases by 20% per year, we are left with the findings and recommendations forwarded by the mid-term review

1. The 3 basic interventions remain vector control, early diagnosis and prompt treatment, surveillance, monitoring and supervision
2. The basic interventions remain sound and have resulted in the reduction of cases but the plateau in the past 3 years suggest that it might not be the intervention per se' which needs changing, rather it is the strategy employed in delivering the intervention and the tools (insecticides, drugs and medicines, LLINs) which need adjustments
3. Case finding need to be done rationally. The choice between active and passive case finding should be made on the basis of need and practicalities. While the need to make the service more widely accessible cannot be over-emphasized, these have to be done in a manner which is ultimately, strategic and cost-efficient. Case-finding should also not be dissociated with treatment. All diagnostic centers need to be treatment centers so as not to miss out on opportunities.
4. Quality assurance systems particularly of RDTs, which already comprise the majority of examinations need to be in place. Areas that have been declared malaria-free areas need to strengthen their microscopy diagnostic capacity not just to diagnose cases but to effect patient follow-up
5. "Essentialization" and micro-stratification needs to be the key. The need to identify the few remaining cohort of families, individuals who account for the infections and who support the continued transmission of malaria, where they are and how to protect them more than they already are.
6. The implementation of vector control strategies should be accompanied by strict monitoring of implementation including the distribution of LLINs to targeted recipients and the conduct of in-door residual spraying. The plan to map the houses for LLIN distribution and IRS is a practical solution to this end.
7. The choice of new innovative tools for interventions including the giant-sized nets for public market areas, and conical LLINs for specified forest workers might be more expensive but these avenues need to be explored in detail out as they may prove to be the exact actual solution to the problem of protecting these individuals
8. Tools such as non-pyrethroid insecticides and DEET-impregnated anklets and bracelets should be approached cautiously. Due diligence should be exercised in studying the efficacy, safety and acceptability of these materials prior to finalizing a decision on their adoption for use. Due consideration should be made not just of the targeted recipients, but as in the case of non-pyrethroid insecticides, the safety of the spray-men who shall be regularly exposed to them.

9. Treatment needs to be more closely monitored for compliance to the standardized treatment protocol. While an 87% compliance is a fine accomplishment in itself, this still means that 13% who were not treated in the standardized manner probably did not have the full benefit of treatment. Translated, 485 + cases might not have completely or adequately treated. Given the current magnitude of cases, this might be enough to retain the parasite pool necessary to maintain transmission at its current level.
10. At the same time, early diagnosis, stricter compliance to treatment protocol and better observed treatment compliance by patients is expected to reduce the proportion of severe cases to less than 1% of the total falciparum cases.
11. The effectiveness of the half-way houses in effecting directly observed patient treatment should also be evaluated to test the cost effectiveness of the solution.

The aforementioned activities are directed towards effecting a 20% annual reduction in cases until 2022 when cases are expected to have been limited to less than 1000 cases reported from only 4 municipalities.

This means that as per objective number one, getting to zero malaria has the four municipalities of southern Palawan (Rizal, Brookes point, Bataraza and Balabac) as top priority, the six other municipalities (Quezon, Sofronio Espanola, Puerto Princesa, Roxas, Taytay, San Vicente) as second priority.

Palimbang, Kalamansig and Esperanza in Sultan Kudarat, and San Jose, Mamburao and Abra de Ilog in Mindoro Occidental are also designated priority areas but since disease and death reduction has been effected in these areas ahead of the target, then implementation in these areas will follow the original plans of actions.

For the second objective, covering the rest of the country. The objective seeks to increase the number of malaria-free provinces to 75 by the end of 2022 and strengthen local health system capacities to effect strict surveillance, early diagnosis, prompt and correct treatment, immediate investigation and response.

The thrust will be directed towards local health systems strengthening and increasing the capacities of local personnel, establishment of systems such as the OLMIS and other protocols for use and operationalizing structures such as the Malaria Elimination Hubs to spearhead surveillance and response efforts. The seven established collaboration systems should be maintained and strengthened to oversee diagnostic capability-building and implementation of the Quality Assurance Systems for diagnostics, the capability-building for entomology and quality assurance systems for vector control.

The specific threat of re-introduction from imported cases has to be properly addressed by insuring that passive case-finding, diagnostic and treatment services are accessible to all areas regardless of malaria endemicity status. Taking into consideration that Malaria preventive and curative packages should be made available in all areas as part of the Universal Health Care principle. This despite the paradigm shift that for most if not all Malaria-free areas, the new threat now comes from imported cases diagnosed in more centrally located facilities compared to the past when cases locally came from the most peripheral areas and were diagnosed in communities.

Sustainability mechanisms also need to be clearly established and developed accordingly. The main DOH principle in making disease control programs sustainable is to simplify and integrate implementation. Malaria cannot be treated as a singular separate program. When the burden of disease has been reduced to levels where elimination is approximated, efforts need to be

directed towards integrating malaria care service delivery unto the mainstream health care delivery system.

The National Strategic Plan for Control and Elimination of Malaria in the Philippines for the years 2020 to 2022 including targets and activities for 2023

Rationale

The 2019 Mid-term Review found that the Malaria Program is not on track to meet its 2019 mid-term impact level targets. While the intended transition of provinces from control to elimination has been reached or even surpassed, the malaria problem in four high-endemic municipalities in southern Palawan has proven resilient to conventional control measures. Additionally, the data indicates a problem in the management of imported cases, where the proportion of severe cases and case fatality rate are high.

The 2013 review and the 2016 and 2019 MTRs identified critical technical and operational issues and gaps that could limit the Program's ability to achieve its intended impact. Furthermore, the 2019 review points to ways in which current interventions in southern Palawan could be augmented and supplemented with new ones. The most innovative of these, DEET impregnated anklets and wristbands would, however, have to be validated by field research in Palawan. This updated Strategic Plan responds to these issues and recommendations.

The present National Strategic Plan continues to pursue the achievement of the Sustainable Development Goal of ending the epidemic of malaria infection in affected countries and the APLMA and ASEAN commitments to achieving malaria elimination in the Asia-Pacific Region by 2030.

The strategies elaborated in the Plan take a health system strengthening approach to malaria control and elimination and are aligned with the Philippines Health Agenda (PHA) and the principles of Fourmula One Plus. The objectives and strategies are also aligned with WHO' Global Technical Strategy for Malaria (GTS) and the WHO Western Pacific Regional Framework for malaria control and elimination.

Vision, Goal and Objectives

The **vision** guiding the NSPCEM is:

A malaria-free Philippines by 2030

The **goal** of this Strategic Plan is:

By 2022, malaria transmission will have been interrupted in all provinces except Palawan, 75 provinces will have been declared malaria-free, and the number of

indigenous malaria cases will be reduced to less than 1200, i.e. by at least 75% relative to 2018

The four objectives and the logical framework are presented in Fig. 5.

Strategic Approaches

The four objectives are aligned with the five objectives of FOURmula One Plus for health and WHO strategies as explained below:

Objective 1. Universal Access to Prevention and Case Management is designed to meet the Service Delivery objective of the Strategic framework 2017-2022 of the FOURmula One plus for Health. It is also aligned with the core strategies of WHO's GTS and Regional Framework

Objective 2. Governance and Human Resources responds to the strategic values of the FOURmula One Plus for Health that address leadership and management capacities, coordination, and support mechanisms necessary to ensure functional, people centered and participatory health systems. It is aligned with Element 1 of the Regional Framework and Supporting Element 2 of the WHO GTS.

Objective 3. Financing accelerated malaria control and elimination is designed to meet the Financial Risk Protection guarantee of the PHA and Fourmula One Plus by ensuring that adequate resources are available to eliminate malaria as a public health problem in the Philippines and prevent re-establishment of transmission. Like Pillar 2, it is informed by Supporting Element 1 of the Regional Framework and Supporting Element 2 of the WHO GTS.

Objective 4. Regulation, Quality Assurance, Use of data and information and Performance Accountability focuses on the mandate of FOURmula1+ to ensure a high level of quality for all services, goods and commodities provided by the program. Related to this, it covers use of data for decision-making; monitoring & evaluation with emphasis on performance accountability in accordance with objective 5 of Fourmula1+. It is informed by Pillar 3 and Supporting Elements 1 and 2 of the Regional Framework and the WHO GTS.

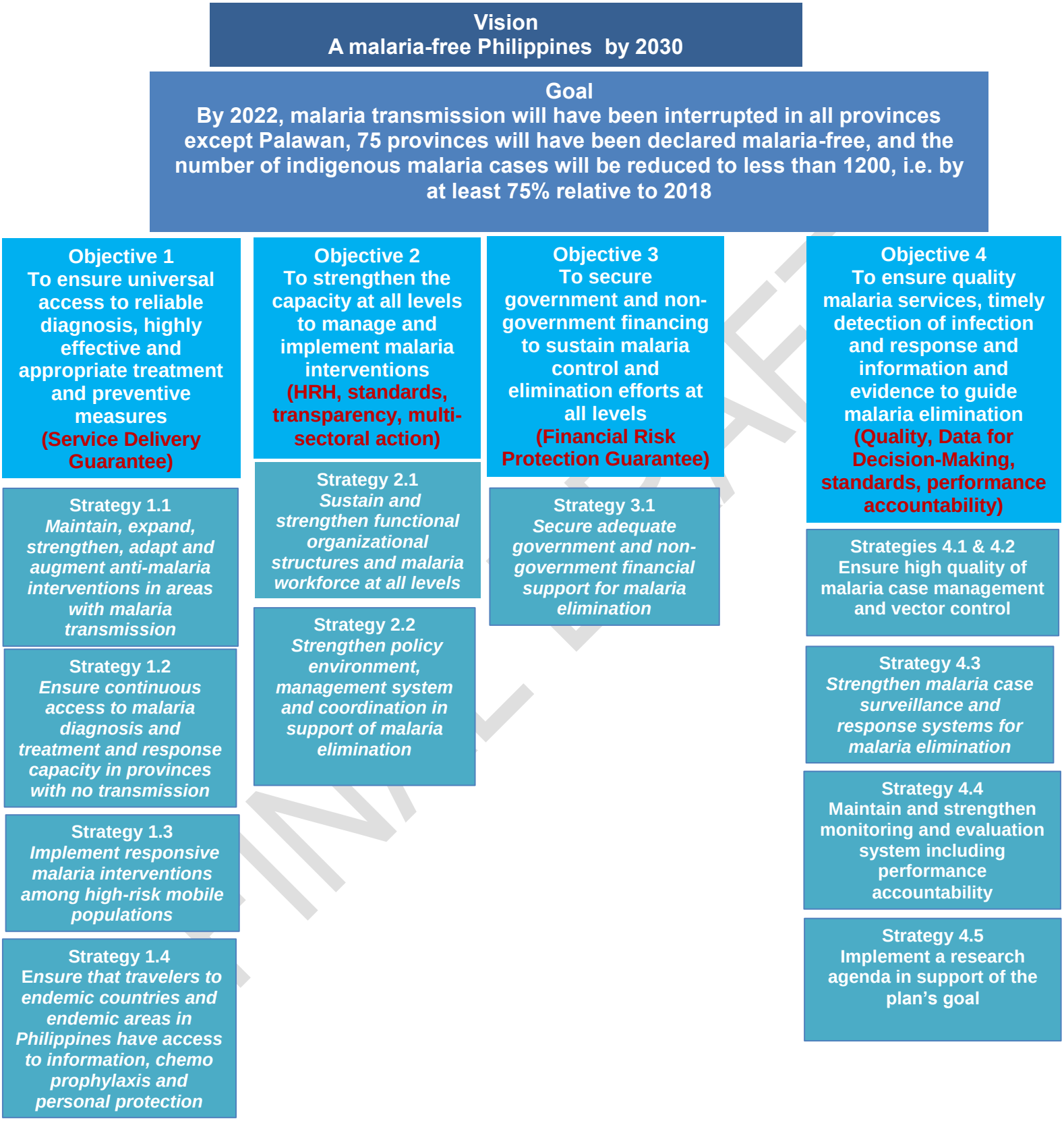


FIGURE 5 LOGICAL STRUCTURE OF THE PHILIPPINE NATIONAL STRATEGIC PLAN FOR THE CONTROL AND ELIMINATION OF MALARIA, 2020-22

Impact Targets

Table 4 summarizes the progressive targets under this updated NSPCEM for a range of core impact indicators in Palawan, the three other provinces that reported local transmission in 2018 but are in elimination phase, and those without local transmission, some of which have already been declared malaria free.

TABLE 4 MALARIA IMPACT TARGETS, 2020-23

Indicator	Base-line 2018	2020	2021	2022	2023
1. Malaria Indigenous Cases and Deaths		25%	50%	75%	90%
1.1 Number of confirmed malaria cases reduced by at least 75%	4807	3600	2400	1200	500
1.2 Number of confirmed malaria deaths reduced to zero	1	0	0	0	0
2. Province with API ≥ 1 per 1,000 at-risk population (Palawan)	1	1	1	1	1
2.1 Number of confirmed malaria cases reduced by at least 90%	4749	3600	2400	1200	500
2.2. Number of municipalities with transmission	13	8	6	4	4
3. Provinces with API < 1 per 1,000 at-risk population in 2018 (Mindoro Occidental, Sultan Kudarat, Sulu)	3	1	0	0	0
3.1 Number of confirmed, indigenous malaria cases reduced to 0	58	5	0	0	0
4. Provinces with zero indigenous malaria cases and malaria free	77	79	80	80	80
4.1 Number of provinces with zero indigenous cases (not yet declared malaria-free)	27	11	8	5	3
4.2 No. of provinces declared malaria-free	50	68	72	75	77
5.Number of independent, chartered and highly urbanized cities (HUCs) with transmission	1	1	1	0	0

At **national** level, reduction in malaria mortality of indigenous and imported malaria in absolute numbers will be monitored constantly and the number of malaria-free and “0 indigenous cases” provinces will be monitored annually.

In **Palawan**, program performance will be assessed based on:

- Number of cases and deaths recorded monthly and annually in the four highly endemic municipalities
- Number of cases and deaths recorded monthly and annually outside the four highly endemic municipalities, in the future, when caseloads are below 100, disaggregated by whether they are contracted within those municipalities or in one of the four highly endemic municipalities.
- Number of municipalities with transmission

In the **three provinces outside Palawan with indigenous cases in 2018**, the number is expected to reach 0 by 2020.

During the period of this plan a systematic approach to declaration of **malaria-free status** of chartered, independent and highly urbanized cities (HUCs) will be adopted (the last indigenous case in one of these cities was observed in Davao in 2017).

Objectives, Outcomes, Strategies and Activities

Objective 1 - To ensure universal access to reliable diagnosis, highly effective and appropriate treatment and preventive measures

The following strategies with corresponding performance indicators will be pursued to ensure universal access to reliable diagnosis, highly effective and appropriate treatment and preventive measures. These include expanding diagnostic and treatment services in remote areas and private health facilities in municipalities with transmission, prevention of re-establishment with focal interventions, as needed, in provinces with no transmission, mapping and implementing interventions among identified high-risk population groups, and developing a special strategy to protect Filipinos travelling to endemic countries and areas.

Strategy	Outcome and higher order output indicators
Strategy 1.1 ***Maintain and augment malaria interventions in endemic areas and active and residual foci***	***Indicator 1.1.1*** *Proportion of parasitologically confirmed malaria cases that received first-line antimalarial treatment according to national guidelines*
	Indicator 1.1.2a *Proportion of treated malaria cases that were followed with slide on day 3* ***Indicator 1.1.2b*** *Proportion of treated malaria cases that followed with slide on day 14* ***Indicator 1.1.2c*** *Proportion of cases followed up on day 3 that were negative* ***Indicator 1.1.2d*** *Proportion of cases followed up on day 14 that were negative* ***Indicator 1.1.2e*** *Proportion of indigenous cases that were classified as severe*

	Indicator 1.1.3a *Proportion of population living in endemic areas, active and residual foci potentially covered by LLINs distributed at a ratio of 1 net per 1.8 persons within current and preceding one year, disaggregated by municipality (operations data)* ***Indicator 1.1.3b*** *Number of LLINs distributed by type (family, single rectangular, single conical) relative to target populations during current and preceding 2 years disaggregated by municipality (operations data)*
	Indicator 1.1.4 *Proportion of population living in endemic areas, active and residual foci reporting having slept the previous night under an LLIN, disaggregated by type of net (see above) and by age-group and sex. Disaggregated also by endemic area/active foci/ residual foci (BUS data)*
	Indicator 1.1.5 *Proportion and number of markets in endemic areas, where a communal giant LLIN is in regular use (at least once a week) (assessed at end of year in malaria reports from the four endemic municipalities)*
	Indicator 1.1.6a *In 2020: Proportion of houses in endemic areas, or active foci, protected by two rounds of indoor residual spraying.* ***Indicator 1.1.6b*** *From 2021: Proportion of houses in endemic areas, or active foci, protected by one round of IRS with a long-acting WHO-approved non-pyrethroid insecticide, with target population determined by independent mapping (see text concerning administrative constraints)*
	Indicator 1.1.7 *Proportion of houses in endemic areas of Palawan, or active foci, protected by indoor residual spraying, where spraying was complete as per independent post-spray supervision report*
Strategy 1.2 ***Ensure continuous access to malaria diagnosis, treatment and preventive measures in zero-indigenous malaria and malaria-free provinces***	***Indicator 1.2.1*** *Number and proportion of non-endemic provinces (all except Palawan) with 0 indigenous cases served by a functional Elimination Hub*
	Indicator 1.2.2 *Proportion of health facilities belonging to each province Health Care Provider Network (HCPN) having received orientation on malaria vigilance (recognition of suspected malaria + knowledge of nearest diagnosis & treatment point) within latest year*
	Indicator 1.2.3 *Proportion of provinces with at least one hospital, where trained clinicians and medicines for management of severe malaria are available*
	Indicator 1.2.4 *Proportion of confirmed cases in non-endemic provinces, who are treated and followed up as per guidelines (criterion: Day 28 slide)*
	Indicator 1.2.5 *Proportion of imported cases that were classified as severe*
	Indicator 1.2.6 *Proportion of population in high risk areas and foci, protected by LLIN distributed at 1/1.8 persons within current and previous 2 years*
Strategy 1.3 ***Implement responsive malaria interventions among***	***Indicator 1.3.1*** *No. of operational plans developed for each high-risk group, which have been implemented and monitored*
	Indicator 1.3.2a

identified high-risk population groups	*Number and proportion of eligible persons screened under this strategy* ***Indicator 1.3.2b*** *Proportion of persons screened found positive*
Strategy 1.4 ***Ensure that travelers to endemic countries and endemic areas in Philippines have access to information, chemo prophylaxis and personal protection***	***Indicator 1.4.1*** *Action plan for protection of travelers against malaria based on stakeholder analysis developed*
	Indicator 1.4.2 *Number of agencies with which effective collaboration has been established*

Strategy 1.1 Maintain and augment malaria interventions in endemic areas and active and residual foci

These areas include the four southern municipalities of Palawan, small endemic areas and active foci in other municipalities in Palawan and active/residual foci in Davao del Norte, Sulu, Mindoro Occidental and Sultan Kudarat. Proven effective interventions must cover the populations in these areas: (i) Case management, and (ii) Vector control.

(i) Case management

Treatment policy

Oral ACT plus a single gametocytocidal dose of primaquine (PQ) remains the standard first-line treatment for *P falciparum*, and ACT plus 14 days of PQ as the first-line treatment for *P vivax*. Full details of first- and second-line treatments for all species of malaria and the management of severe or complicated infection are provided in the MOP.[10]

Patients taking primaquine for 14 days are advised about potential side-effects. Those in half-way houses will be monitored daily for dark urine by the field assistants. Data will be collected on a total of 500 Pv patients over about two years in the high endemic areas. If there are no severe adverse events in any of these, it can be considered that primaquine 14 days is safe in the area, but patients must still be warned. This is considered an operational research project.

During the plan period, a potential second-line ACT will be assessed through a therapeutic efficacy study (Strategy 4.4). If it proves efficacious and well tolerated, it will be incorporated in the treatment policy.

RDT and malaria microscopy services

To ensure full coverage in the four high-burden municipalities in Palawan, additional RDT sites will be established, in remote thinly populated areas based on mapping. BMMCs that were established in the past but have become non-functional will be converted into RDT services. RDTs are also made available at RHUs and hospitals for prompt diagnosis of cases where microscopy may not be immediately available. Operational support and QA will continue to be provided to Barangay Malaria Microscopy Centers (BMMCs) that remain functional. Patients

[10] National Malaria Program: Manual of Operations, Chapter 4

treated should be followed up with slide on Days 0 (1st day of treatment), 3 and 14 (12-16 is acceptable). To cope with the number of slides, the existing number of BMMCs will be maintained in endemic areas. Some BMMCs are retiring, so they must be replaced by new volunteers, who will need basic training.

Training on integrated microscopy, RDT use, and case management will be available continuously in areas where malaria personnel are new, as well as refresher courses to those who were trained more than 3 years ago.

RDT Volunteers and Barangay Health workers doing malaria microscopy receive incentives from local government (barangay, municipality and province). The malaria program will continue to advocate for the maintenance of this crucial support.

Half-way houses and adherence

To ensure patient adherence in high-endemic areas, half-way houses have been and are being constructed, where patients receive supervised treatment for 3 days (Pf) and 14 days (Pv). To motivate the patients, free meals are provided for them and one accompanying person. This is handled partially by RDT Volunteers, partially by field assistants (young, paid volunteers, usually recruited in other parts of Palawan). During the period, this system will be taken to scale, so that follow-up can be offered to all patients in the three most highly endemic municipalities, Bataraza, Brooke's Point and Rizal.

In endemic areas, efforts will be made to integrate malaria services with other health services, such as control of other vector-borne diseases, maternal and child health, reproductive health, childhood immunization and nutrition services, especially at the recently established half-way houses, which could with time become health posts. There are now 5 half-way houses; by end of 2019 there will be 11. They are so far only in Rizal municipality, where the need is greatest. Data is collected on the use of the halfway houses to enable an evaluation in early 2020.

Case management services will continue to be scaled up in the private sector where clinics and hospitals will be given the same assistance (e.g. training of staff and provision of drugs and supplies) to enable them to manage their own clientele – subject to their agreed compliance with surveillance and reporting requirements. This will be extended to health facilities in military camps, school clinics, and company and NGO-operated clinics.

IEC

Providers of treatment, when trained and re-trained also receive training on face-to-face education of patients about adherence and of their family members on health-seeking.

The indicators for case management focus on assessing correctness of treatment and follow-up slide results to provide an indicator of patient adherence. The old indicator of percentage of suspected cases tested will no longer be monitored, as its value has for several years been 100%; this is because only cases that are tested are recorded; presumptive treatment is no longer practiced. All these indicators can be collected through the PhilMIS/OLMIS electronic malaria surveillance platforms.

(ii) Vector control

LLINs

The cornerstone of prevention is high coverage and utilization levels for LLINs through a program of continuous rolling distribution and replacement of old and expired nets; this will be supplemented by targeted mass distribution where a large proportion of LLINs in a community are about to expire simultaneously (generally when they reach two years since original distribution).

To improve the LLIN operations with the objective of improving the utilization, the distribution of LLINs will be no longer to central barangay distribution points, but house to house with recording of numbers of different types of nets received by each household. Spraymen, field assistants and RDT Volunteers will be trained to assist in distribution and face-to-face health education including helping families to hang the nets, providing tools, nails and tying material.

BHWs, RDT volunteers, field assistants, spraymen, and community- organizers will be involved in developing a LLIN register linked to the household maps and listings to be created by mapping of the three most endemic municipalities in 2020 to aid planning operations and community mobilization, under the guidance and supervision of Regional, Provincial and Municipal Malaria Coordinators. Appropriate sizes and numbers of LLINs according to DOH protocols will be procured and distributed at a community ratio of 1 family-size net per 1.8 individuals to ensure a minimum ratio of 1 net to 2 household members in each household, when nets have been distributed. In southern Palawan, the nets distributed are currently family-size or single rectangular. There is a pilot scheme already initiated to use conical single nets instead of rectangular. If successful (the conical nets are popular and widely used by forest-goers as per indicator 1.1.4), it is planned that eventually, all single nets will be conical. For single nets, the norm will be distribution of 3 per household, assuming that it will be needed by an average of two adult men going to the forest and one child aged more than seven years and traditionally entitled to separate sleeping space. The effective coverage will be monitored through indicators in “bednet” utilization surveys (BUS).

Also, in the municipalities of Bataraza, Brooke’s Point and Rizal, polyethylene mats will be distributed in 2020 based on a preliminary needs assessment conducted by community organizers. It is estimated *a priori* that 2 mats will be needed per household.

It has been observed that many people including children have a habit of staying overnight at marketplaces, where they engage in videogames and other social activities. Giant nets will be provided for each marketplace in the three highly endemic municipalities to protect at least mothers and children. There are a total of 150 market-places in the three municipalities, and it will be necessary to replace these nets every year.

IRS

In southern Palawan, IRS has been done from 2016 to 2019 with three rounds of pyrethroid, where the implementation of each round has lasted for about three months. As noted by the mid-term review in 2019, WHO recommends that when IRS is implemented in an area, which is also targeted for LLINs, the insecticide used for IRS should always be with a non-pyrethroid insecticide to prevent insecticide resistance. With the detection of incipient pyrethroid resistance in several sites in the Philippines including Palawan in 2019, this concern has become urgent.

The most obvious alternative to pyrethroid for IRS in the Philippines would be a long-acting organophosphate, pirimephos-methyl, which only needs to be sprayed once a year whereby the total cost of spraying is greatly reduced. Unfortunately, this product is only expected to be registered in the Philippines in 2020. In late 2020, it will be tried out in one barangay in Palawan, while routine IRS will be undertaken with pyrethroid in the rest of the usual operational area, but only in two rounds, where each round will be completed in one month. Given the long procurement cycle for insecticide, it is expected that the non-pyrethroid insecticide can only be introduced on a large scale in 2022. It is possible that administrative rules will constrain the volume of a new insecticide from a new supplier that can be imported in a year; in that case, IRS in 2022 will be partially with the long-acting organophosphate, partially with a pyrethroid. From 2023, all IRS is expected to use the long-lasting organophosphate. In Bataraza, Brooke's Point and Rizal, IRS will be applied for universal coverage in a single synchronized round within February - March (before the start of seasonally increasing transmission).

In 2020 a mapping will be carried out to establish an inventory of households and population in the three municipalities. The implementation will be followed by post-spray monitoring for completeness and quality led by an experienced sanitary engineer from another region.

Activities, interventions and targets under Strategy 1.1 are summarized in the following table. Quality assurance related to these major intervention areas are presented under Objective 4.

Strategy 1.1 **Strategy 1.1** ***Maintain and augment malaria interventions in endemic areas and active and residual foci***							
Indicator 1.1.1 *Proportion of parasitologically confirmed malaria cases that received first-line antimalarial treatment according to national guidelines*							
Year	**Baseline 2018**	**2020**	**2021**	**2022**	**2023**		
Annual Target	**82.2%**	**90%**	**100%**	**100%**	**100%**		
Activity Areas, Indicative Activities and Timing							
Action Points		**2020**	**2021**	**2022**	**2023**		
1. Maintain and strengthen diagnostic capacity							
1.1 Procure and distribute lab supplies		■	■	■	■		
1.2 Provide RDT kits		■	■	■	■		
1.3 Training on Malaria Microscopy and RDT							
a. Train and deploy additional RDTvolunteers/replacements		■	■	■	■		
b. Train on RDT/BMMC supervision		■		■			
c. On the job training for other RHU staff (non-MedTech) on RDT			■				

d. Training on Basic Microscopy for newly hired MedTech and BMMCs as Replacements	■		■			
e. Refresher Training on malaria microscopy (BMMC, RHUs and Hospitals)	■			■		
f. Refresher training for RDT volunteers	■	■	■	■		
g. Training for midwives supervising RDT volunteers, BMMCs		■		■		

Indicator 1.1.2
Proportion of treated malaria cases that were followed with slide on day(a) 3/(b)14 and were negative on day(c) 3/(d)14

Year	Baseline 2018	2020	2021	2022	2023		
Annual Target	n.a.	a: 80% b:90% c:50% d:95%	a: 80% b:90% c:70% d:95%	a: 80% b:90% c:70% d:95%	a: 80% b:90% c:70% d:95%		

Indicator 1.1.2e
Proportion of indigenous cases that were classified as severe

Year	Baseline 2018	2020	2021	2022	2023		
Annual Target	1.7%	>1%	>1%	>1%	>1%		

Activity Areas, Indicative Activities and Timing

Action Points	2020	2021	2022	2023		
2. Enhance clinical management and treatment						
2.1 Procure and distribute medicines	■	■	■	■		
2.2 Train health personnel on clinical management						
a. Health personnel from RHUs, Public and Private Hospitals, RDT volunteers, BMMCs		■				
b. training on severe malaria management for internists, pediatricians		■				

Indicator 1.1.3a. Proportion of population living in endemic areas, active and residual foci potentially covered by LLIN distributed at a ratio of 1 net per 2 persons within current and 2 preceding years *Indicator 1.1.3b. Number of LLINs by type (family, single rectangular, single conical) distributed per person of target population during current and preceding 2 years*							
Year	**Baseline 2018**	**2020**	**2021**	**2022**	**2023**		
Annual Target for 1.1.3a	**100%**	100%	100%	100%	100%		
Indicator 1.1.4. Proportion of population living in endemic areas, active and residual foci reporting having slept the previous night under an LLIN provided within current or 2 preceding years, disaggregated by type of net, age group and sex							
Year	**Baseline 2018**	**2020**	**2021**	**2022**	**2023**		
Annual Target	**80%**		85%		85%		
Indicator 1.1.5. Proportion of markets, in endemic areas, where a communal giant LLIN is in regular use							
Year	**Baseline 2018**	**2020**	**2021**	**2022**	**2023**		
Annual Target	**n.a.**	60%	100%	100%	100%		

Indicator 1.1.6. Proportion of households in targeted areas of Palawan, according to stratification, or in active or residual focus protected by IRS, disaggregated by insecticide class							
Year	**Baseline 2018**	**2020**	**2021**	**2022**	**2023**		
Annual Target	**n.a.**	**at least 80%**	**At least 80%**	**At least 80%**	**At least 80%**		
Indicator 1.1.7. Proportion of sprayed households , where coverage was complete as per post-spray supervision							
Year	**Baseline 2018**	**2020**	**2021**	**2022**	**2023**		
Annual Target	**n.a.**	**100%**	**100%**	**100%**	**100%**		
Activity Areas, Indicative Activities and Timing							
Action Points							
3. Undertake vector control measures		2020	2021	2022	2023		
3.1 Procure/distribute LLINs, family & single size and mats with IEC		■	■	■	■		
3.2 Procure and distribute giant communal nets for markets		■	■		■		
3.3 Conduct mapping of all households in Bataraza, Brooke's Point, Rizal		■					

3.4 Procure insecticides, spray cans and PPE	■	■	■	■		
3.5 Conduct IRS (recruitment, training and orientation of spraymen)	■	■	■	■		
3.6 Conduct post-IRS monitoring	■	■	■	■		

Strategy 1.2 Ensure continuous access to malaria diagnosis, treatment and preventive measures in zero-indigenous malaria and malaria-free provinces

Provincial Malaria Elimination Hub

Elimination Hubs are responsible for overseeing and sustaining the malaria-free status of each malaria-free province.[11] One hub should be established in each province reporting zero indigenous cases, whether declared malaria-free or not. About 50 provinces already have one. The Provincial Elimination Hub comprises a team of designated personnel with relevant expertise to undertake malaria surveillance and response, health promotion, malaria case management including orientation of front-line providers and responsive vector control when indicated. Where specific skills or expertise are in short supply (e.g. entomology, epidemiology), this may be sourced from the CHDs or an inter-regional Collaborating Center. Along with personnel, the elimination hubs shall be equipped with minimum equipment to undertake all forms of investigation and to respond. This includes a sufficient stockpile for any vector control response required. LGUs are the owners of Elimination Hubs and must provide the necessary support for the human resources.

Prevention of re-establishment of transmission

In all provinces reporting zero indigenous cases, whether declared malaria-free or not, the essential strategy is prevention of re-establishment of transmission. This requires:

1. Vigilance of general health services, meaning that every primary level provider (member of the province primary health care provider network) can recognize a case of suspected malaria and respond to it by immediately referring the patient for diagnosis
2. A network of facilities providing quality assured diagnosis by microscopy or RDT and appropriate antimalarial treatment. Generally, as per present guidelines and practice, there is a microscopy point in most RHUs and a small stock of RDT in district and provincial hospitals.

The priority action for each provincial malaria hub is:

1. Map the province health care provider network (HCPN) including private
2. Ensure that the density of the diagnosis and treatment network is sufficient to ensure that a patient suspected of having malaria by any first line provider in the province can be tested for malaria within 2 hours. As a general rule, malaria microscopy should be maintained in all RHUs (municipal level health facilities), while RDTs should be supplied to all hospitals (most of the RDTs distributed will never be used and will therefore eventually be discarded - this is a small expense when weighed against the risks of delayed diagnosis of malaria). Antimalarial medicines will be supplied to each province as boxes with 20 treatments for each age-group. Each elimination hub should determine,

[11] DOH Administrative Order 2013-0007: *Guidelines on the Establishment of Malaria Elimination Hubs*

whether to keep those at one central facility in the province or to distribute them among selected health facilities according to the probability that they will see malaria cases.

3. Conduct *orientations on suspected malaria and the local availability of diagnosis and treatment* targeting all members of the HCPN through a representative of each health facility mainly RHUs, hospitals and clinics. These activities can well be integrated with other health programs. Consider setting up a province hotline. In this context, the provincial hub should ensure that each province has a hospital, where clinical skills and antimalarial medicines are maintained for management of cases of severe malaria. This will be supported by pamphlets for primary health care providers and small posters for health facilities directed at clinicians to be distributed in 2020. In due course, the program at central level may develop an e-learning module for this purpose.
4. Maintain the system with necessary supplies and regular updating of orientations. Ensure that the knowledge concerning malaria risk in the world and in the Philippines is regularly updated.

In provinces with zero indigenous cases, all malaria cases should be documented, irrespectively of their origin and where they are treated. As their drug susceptibility status is uncertain, and radical cure is essential, they should be followed up with slides on days 0, 3, 7, 14 and 28.

Vector control

For preventing re-establishment of transmission, there are four situations requiring vector control

1. An area that is receptive (typically transmission in recent past) AND has risk of importation of malaria. The importation is often domestic, it can for example be from a highly endemic municipality in Palawan to one with no or little malaria. Examples include camps for construction-work, roadbuilding, plantations etc. See also Strategy 1.3.
2. A case has already been imported into a receptive area; Delimit the area of potential transmission ("potential focus"). It needs vector control
3. Active foci
4. Residual inactive foci (for 3 years after transmission stopped).

The vector control method should normally be LLIN and IRS for active foci, LLIN only in other situations.

The DOH will distribute to each province reporting 0 indigenous malaria 500 LLINs and insecticide for IRS for 500 households once a year to be used (or kept in reserve) for the four situations mentioned.

Moreover, the DOH intends to widen and deepen the base for attaining the vision of a malaria-free Philippines by establishing Malaria Free Regions consisting of contiguous provinces and cities that have already been declared malaria free on an individual basis and maintained malaria-free status for two years after declaration. This approach gradually increases the completeness of declared malaria-free areas throughout the country. It will require a procedure for declaring independent cities such as those of the National Capital Region as malaria-free.

. Strategy 1.2

Ensure continuous accessibility to anti-malaria diagnostic, treatment and preventive measures in zero-indigenous malaria case and malaria free provinces

Indicator 1.2.1 Number and proportion of provinces without endemic malaria served by a functional Elimination Hub

Year	Baseline 2018	2020	2021	2022	2023		
Annual Target	55/77	70/80	75/80	80/80	80/80		

Indicator 1.2.2 *Proportion of primary level providers of each province Health Care Provider Network (HCPN) having received orientation on malaria vigilance (recognition of suspected malaria + knowledge of nearest diagnosis & treatment point) within current or previous year*

Year	Baseline 2018	2020	2021	2022	2023			
Annual Target	n.a.	50%	100%	100%	100%			

Indicator 1.2.3 *Proportion of provinces with at least one hospital, where trained clinicians and medicines for management of severe malaria are available*

Year	Baseline 2018	2020	2021	2022	2023			
Annual Target	n.a.	25%	75%	100%	100%			

Indicator 1.2.4 *Proportion of confirmed cases in non-endemic provinces, that are treated ar followed up as per guidelines (Criterion: Slide on Day 28)*

Year	Baseline 2018	2020	2021	2022	2023			
Annual Target	50%	50%	100%	100%	100%			

Indicator 1.2.5 *Proportion of imported cases that are classified as severe*

Year	Baseline 2018	2020	2021	2022	2023			
Annual Target	12.3%	<3%	<1%	<1%	<1%			

Indicator 1.2.5 ***Proportion of population in foci or identified high-risk areas covered by LLIN distributed at a ratio of 1 net per 1.8 persons within current and previous 2 years***

Year	Baseline 2018	2020	2021	2022	2023		
Annual Target	TBD	100%	100%	100%	100%		

Activity Areas, Indicative Activities and Timing

Action Points	2020	2021	2022	2023		
1. Prepare, issue guidelines on prevention of re-establishment of transmission as supplement to MOP (DOH central)	■	■	■			
2. Establish and implement procedure for declaration of malaria-free cities and regions (DOH central)		■	■	■		
3. Orient Regions and LGUs on prevention of re-establishment of transmission and on requirements for elimination hubs.	■	■				

4. Establishment of Elimination Hubs	■	■	■	■		
4.1 Assessment and validation of malaria-free provinces, cities, regions	■	■	■	■		
4.2 Passage of ordinance/ resolution in support to elimination hub establishment and operation (province)	■	■				
4.3 Provide lab supplies/equipment (province, except for RDT)	■	■	■	■		
5. 1 Supply RDT and antimalarial medicines to provinces/cities with elimination hubs; buffer stocks	■	■	■	■		
5.2 Establishment by elimination hubs of network of diagnosis and treatment sites including at least 1 hospital for severe malaria	■	■				
6. Vector control supplies for elimination hubs: LLINs, insecticides	■	■	■	■		
7. Training of malaria elimination hub staff and point persons by regional offices/collaborating centers	■	■	■	■		
7.1. Training on case management, surveillance, response	■	■	■	■		
7.2 Clinical Management of severe malaria		■		■		
7.3 Refresher training on malaria microscopy	■	■	■	■		
7.4 Refresher training on IRS	■	■	■	■		
8. Orientations for primary level providers on vigilance	■	■	■	■		
9. Focal vector control if needed (provinces supported by ROs)	□	□	□	□		

Strategy 1.3. Implement responsive malaria interventions among identified high-risk population groups

Universal access or coverage of malaria prevention and case management is challenging among mobile, displaced and other marginalized populations. Such populations need to be reached through special approaches that may vary from the traditional way services are usually delivered.

Indigenous populations residing in remote areas of Palawan are identified under this NSPCEM as the principal vulnerable group for specific, focused interventions. The approach to this population is already described under strategy 1.1, and it is expected that it will be possible to add one novel intervention to the armamentarium (see 4.4). The approach also includes partnership with the National Commission on Indigenous Peoples (NCIP), traditional and

religious leaders, schools, NGOs and faith-based organizations (FBO) involved in reaching them with services supported by IEC and development activities.

Six **other high-risk groups** have been identified for further focused intervention:

i) Forest workers and other informal occupational groups in remote areas, especially fisherfolks, who at times land in endemic areas of Indonesia;
ii) The military, who are intermittently assigned and re-assigned for field operations;
iii) Foreign students and potentially other temporary immigrants from endemic countries;
iv) Internally displaced populations (IDP) as a result of armed conflict or natural disasters;
v) Overseas Filipino Workers, whose work destination may bring them to high malaria-endemic countries;
vi) Tourists and other travelers (both local and international).

Groups v) and vi) will be addressed below in a travelers' health strategy (1.4).

The program has established screening and IEC for groups of fisherfolks in several provinces. Several ROs have started partnering with the Philippines National Police, for provision of LLINs.

More work will be required in each province for profiling of the high-risk groups, Results of this assessment will inform the formulation of a specific combination of interventions for each group. This may include:

- Identification of inter-sectoral stakeholders and service providers,
- capacity-building of service providers, including from among the high-risk groups
- information about malaria risk and where to seek care in case of fever,
- screening for malaria, possibly follow-up and repeated screenings,
- provision of LLINs.

The activities should always be developed in a participatory and inclusive manner. A reporting system will be established on the service coverage among each group especially for screening and provision of LLINs.

Strategy 1.3 **Implement responsive malaria program interventions among identified high risk population groups**							
Indicator 1.3.1 No. of operational plans developed for each high-risk group, which have been implemented and monitored							
Year	**Baseline 2018**	**2020**	**2021**	**2022**	**2023**		
Annual Target	**3**	**6**	**10**	**10**	**10**		
Indicator 1.3.2 (a) Number and proportion of eligible persons screened under this strategy; (b) Proportion of persons screened found positive							
Year	**Baseline 2018**	**2020**	**2021**	**2022**	**2023**		
Annual Target	**NA**						
Activity Areas, Indicative Activities and Timing							
Action Points		**2020**	**2021**	**2022**	**2023**		
1. Identify high-risk groups for focused interventions (provinces)		■	■	■	■		

2. Develop plan for each high-risk Group (provinces supported by ROs.	■	■	■	■		
3. Conduct consultations/meetings and advocacy with identified groups and stakeholders	■	■	■	■		
4. Implement agreed strategies in collaboration with groups and stakeholders, possibly with MOA	■	■	■	■		

Strategy 1.4. Ensure that travellers to endemic countries and endemic areas in Philippines have access to information, chemoprophylaxis and personal protection

Judging from the high proportion of severe malaria among imported cases and considering the risk posed by delayed treatment in relation to re-establishment of transmission, this area must be considered a priority for the program at national level.

The program has initiated contacts with the Bureau of Quarantine and the Overseas Workers Welfare Administration (OWWA) of Department of Labor and Employment about IEC for travelers. It is now time to establish a systematic plan of action to deal with malaria in international travelers.

The main stakeholders include:

- Bureau of Quarantine, where malaria prevention can be combined with vaccinations
- Pharmaceutical sector: to ensure the availability of recommended antimalarials for chemoprophylaxis. The registration of atovaquone-proguanil to provide chemoprophylaxis for children should be considered. This needs to be submitted to the malaria TWG; if approved, it must be included in the MOP/CPG and National Antibiotic guidelines.
- The major private and public hospitals in cities, which are not likely to be reached soon by elimination hubs, as these are not yet established in the NCR and other HUCs.
- Travel and tourist agencies
- OWWA and OFW recruiting agencies
- Department of Tourism

The strategy to be developed will depend on extensive consultations, orientations, revision of policies and production and dissemination of IEC materials. It is not foreseen that the program will take responsibility for supplying medicines or nets to these groups.

One IEC element already identified is the placement of posters directed at departing and arriving international travelers in all international airports.

Strategy 1.4 Ensure that travelers to endemic countries and endemic areas in Philippines have access to information, chemo prophylaxis and personal protection							
Indicator 1.4.1 Action plan for protection of travelers against malaria based on stakeholder analysis developed							
Year	**Baseline 2018**	**2020**	**2021**	**2022**	**2023**		
Annual Target	**0**	**1**					

Indicator 1.4.2 Number of agencies with which effective collaboration has been established							
Year	**Baseline 2018**	**2020**	**2021**	**2022**	**2023**		
Annual Target	**2**	**4**	**6**	**8**	**8**		

Activity Areas, Indicative Activities and Timing						
Action Points	**2020**	**2021**	**2022**	**2023**		
1. Identify and map stakeholders	■					
2. Hold consultation meeting	■					
3. Present plan of action for DOH approval	■					
4. Obtain approval and Implement plan in collaboration with stakeholders, possibly with MOAs		■	■	■		
5. Place posters in all international airports	■	■				

Objective 2 - To sustain and strengthen the capacity at all levels to manage and implement malaria interventions

The following strategies – with corresponding performance indicators – will be pursued to strengthen health system capacity at all levels towards malaria elimination:

Strategy	Outcome and higher order output indicators
Strategy 2.1 ***Establish functional organizational structures and malaria work force at all levels***	***Indicator 2.1.1*** *DOH-Central Offices (IDO) with appropriate number per category of staff*
	Indicator 2.1.2 *All DOH-ROs with appropriate number per category of staff for Malaria Program*
	Indicator 2.1.3 *All PHOs with designated Malaria Point Person, P/CESU personnel and QAS validator*
	Indicator 2.1.4

	All MHOs in Palawan with designated Malaria Point Person, M/CESU personnel and Med Tech
Strategy 2.2 ***Strengthen the policy environment, management systems and coordination mechanism in support of malaria elimination***	***Indicator 2.2.1*** *No. and proportion of LGUs with a malaria control / elimination plan and corresponding budget within their respective LIPH / AOPs*
	Indicator 2.2.2 *No. of functional collaborating centers (defined below)*

Strategy 2.1 Establish functional organizational structures and malaria work force at all levels

The 2013 comprehensive review and the 2016 and 2019 MTRs identified the very limited number of organic personnel assigned to or assisting the Malaria Program as one of the biggest challenges to the achievement of elimination. Strategy 2.1 emphasizes the need for DOH to strengthen its organic personnel complement at the national level and establish a mix of expertise needed to manage and propel the elimination efforts nationwide; this may entail a transfer of some functions from the Principal Recipient of the current Global Fund grant.

The current situation between DOH, WHO, and PSFI as PR for GF can be described as follows:

(i) The Malaria Program has a dedicated national Malaria Program Manager, with only project-contracted, i.e. GF funded) staff handling many aspects of the Program.
(ii) Current GF funded staff include a medical malaria specialist and a public health specialist
(iii) The DOH at national level will engage a full-time entomologist / vector control specialist and a medical technologist through project funding. The positions are presently vacant, to be filled
(iv) A data management support has been recruited to manage a national elimination data base.
(v) WHO has also recruited a MIS specialist to support the program, funded by GF
(vi) A government officer has been engaged to track expenditure of the DOH IDO sub-allotments for malaria to the sub-national level (see also Strategy 3.1)
(vii) Subject to refinements of national procurement mechanisms (tasked to the National TB Program under Global Fund continuation funding arrangements), the logistics management inventory system (LMIS) developed by the current PR will be adopted nationally, and Program staff will oversee its implementation from the national office.

At the sub-national level, advocacy will be pursued to retain all 17 existing Malaria Program Coordinators in CHDs despite the issuance of the DOH-Rationalization Plan. A pool of entomologists and, in some cases, expert microscopists may have to be shared among cluster regions; as malaria incidence falls, some disease control staff may be required to multi-task on malaria and other communicable diseases. Advocacy will also be undertaken with the ROs to continue to engage existing Global Fund project staff currently assigned in project provinces in a phased manner, ensuring that their experience and institutional memory are not lost to the Program. This will provide Regional Malaria Coordinators with the necessary technical and operational support to oversee elimination and prevention of re-establishment of transmission and can be funded through the sub-allotment from the DOH central office (DOH-CO). Moreover,

some RO staff currently assigned as Provincial Malaria Coordinators must soon be replaced by a PHO organic staff to strengthen local ownership of the program.

A functional Regional Collaborating Center fulfills following criteria:

- Designated team to guide province strategies for prevention of re-establishment of transmission
- Designated personnel (in an integrated vector management unit) capable of training provincial elimination hubs in basic entomological surveillance, carry out susceptibility testing and bioassays, direct and evaluate IRS operations.
- Maintained anopheline insectary.
- Designated personnel to train provincial staff for microscopy quality assurance.
- Designated personnel to train medical specialists in management of severe malaria.

At the LGU (province) level, the elimination hub normally is managed by one malaria focal point, who is in most cases a medical technologist. This person is supported by the provincial health officer, who is a medical doctor, a sanitary engineer, IT personnel, and others.

Strategy 2.1 ***Establish functional organizational structures and malaria work force at all levels***							
Indicator 2.1.1 ***DOH-Central Offices (IDO, EB, RITM) with appropriate number per category of staff***							
Indicator 2.1.2 ***All DOH-ROs with appropriate number per category of staff for Malaria Program***							
Year	**Baseline 2018**	**2020**	**2021**	**2022**	**2023**		
Target: DOH-CO	**1**	**9 positions**		9	9		
Target: DOH-ROs	**TBD**	**18 DOH-ROs with HR compliment**		18	18		
Activity areas, indicative activities and timing							
Action Points		**2020**	**2021**	**2022**	**2023**		
1. Expand personnel compliment at national level to address core functions							
• 1 Entomologist			■	■	■		
• 1 IT Person (c/o KMITS)		■	■	■	■		
• 1 Logistics Person		■	■	■	■		
• 1 Technical Writer		■	■	■	■		
• 1 National and 3 Regional M&E / Surveillance Officers (1 Palawan, 1 Luzon-Visayas and 1 Mindanao)		■	■	■	■		
3. Include the above positions in the DOH – Rationalization Plan		■					

Indicator 2.1.3 *All PHOs with designated Malaria Point Person, P/CESU personnel and QAS validator*							
Indicator 2.1.4 *All MHOs in Palawan with designated Malaria Point Person, M/CESU personnel and Med Tech*							
Year	**Baseline 2018**	**2020**	**2021**	**2022**	**2023**		
Annual Target: PHOs		**60%**	100%	100%	100%		
Annual Target: M/CHOs	**5/25**	**15/25**	25/25	25/25	25/25		
Activity areas, indicative activities and timing							
Action Points		2020	2021	2022	2023		
1. Advocate among LGUs the designation of Malaria Point Persons to perform core functions		■	■	■	■		

Strategy 2.2 Strengthen the policy environment, management systems and coordination mechanism in support of malaria elimination

Strategy 2.2

Strengthen the policy environment, management systems and coordination mechanism in support of malaria elimination

Local Level Strategic and Operational Plans

Management systems must be put in place if malaria elimination is to be achieved and re-establishment of transmission prevented. Foremost is the need for each RO and PHO to prepare their respective Malaria Action Plans, guided by this updated national Strategic Plan. Planning exercises are also expected to clarify funding sources and to encourage the LGUs put up their own allocations for items and activities for which they take principal responsibility *vis à vis* those to be augmented by the DOH and supported by external (donor) funds.

However, in this, it should be respected that the major program commodities should be procured only by DOH at central level to minimize costs and to ensure compliance with norms and maximize quality. These commodities are: RDTs, antimalarial medicines, LLINs, Spraycans and their spares, and insecticides for IRS.

Indicator 2.2.1 Number and proportion of LGUs with malaria control and elimination plan with corresponding budget in their LIPHs / AOPs							
Year	**Baseline 2018**	**2020**	**2021**	**2022**	**2023**		
Annual Target							
a. Indicator 2.2.2a Number and % of municipalities in Palawan with plan and budget	**n.a.**	**15/25**	25/25	25/25	25/25		
b. Indicator 2.2.2b Number and % provinces outside Palawan with plan and budget for elimination/ prevention of re-establishment	**n.a.**	**50/80**	**60/80**	**70/80**	**80/80**		

Activity Areas, Indicative Activities and Timing						
Action Points	**2020**	**2021**	**2022**	**2023**		
1. NSPCEM 2017-22 dissemination	■					
2. Revision of Sustainability Plan and Road Map	■					
3. Advocacy for LGUs to incorporate malaria interventions in their LIPH and AOP	■	■	■	■		
4. Assessment and Micro-Planning: Regions and Provinces to develop plan for control, elimination, prevention of re-establishment	■	■	■	■		

Collaborating Centers

Training support will be put in place through an improved inventory of trained staff (by facility), the strengthening of Collaborating Center capacities and updating of training modules. Application of knowledge and skills learned by staff from the training programs will also be monitored. Seven Collaborating Centers have been established in Regions 2, 3, 4a, 4b (Palawan), 7, 9 and 11. Many CHDs have over the years received equipment from the Global Fund and therefore still need its support for maintenance of this equipment (for which the DOH cannot take responsibility according to existing regulations). The central office will monitor whether they are functional according to above criteria.

Training modules have now been developed for nearly all topics, but they are still required for:

- Province (Palawan: municipality) planning for prevention of prevention of re-establishment of transmission
- Basic entomological surveillance in provinces with no malaria transmission
- Quality assurance for RDTs (new tools for use in the periphery are available)

Indicator 2.2.2. No. of functional collaborating centers							
Year	**Baseline 2018**	**2020**	**2021**	**2022**	**2023**		
Annual Target No. of functional collaborating centers	**n.a.**	**5**	**7**	**7**	**7**		
Activity Areas, Indicative Activities and Timing							
Action Points		**2020**	**2021**	**2022**	**2023**		
1. Training module on prevention of re-establishment of transmission		■	■				
2 Training module on RDT QA		■	■				
3 Training module on basic Entomology for provinces without transmission (entomologists or med techs)		■	■				
4. Training courses for province level designated level staff based on needs assessment in each region							
4.1 Diagnosis (Microscopy and RDT)		■	■	■	■		
4.2 Vigilance and Clinical Management		■	■	■	■		
4.3 Basic Entomology		■	■	■	■		

4.4 Surveillance and Response	■	■	■	■		

Objective 3 - To secure government and non-government financing to sustain malaria control and elimination efforts at all levels

Strategy	Outcome and higher order output indicators
Strategy 3.1 Secure adequate government and non-government financial resources in support of malaria control and elimination	***Indicator 3.1.1*** *DOH national and sub-national budget for the malaria program is sustained, if not increased*
	Indicator 3.1.2 *Proportion of provinces and chartered cities following a cost-sharing scheme between DOH and LGUs*

Strategy 3.1 Secure adequate government and non-government financial resources in support of malaria control and elimination

Strategy 3.1 is designed to secure funding to prevent re-establishment of transmission and reduce the malaria burden in Palawan to the lowest level possible by 2022 and 2023, prioritizing national and local government sources. On finalization of this updated NSPCEM, a financial gap analysis will be conducted, and a corresponding investment plan will be developed.

It is expected that the allocation from DOH Central Office will be maintained at a level of PHP 223 million annually for 2020 to 2023. The funding from DOH Central Office can according to regulations only be used for procurement of commodities (except for PHP 2 million per year that may be allocated to operations). In contrast, CHDs are expected to finance costs of operations, which may use the commodities procured by DOH Central or partners.

Local Government sources of financing will likewise be mobilized. A strategic planning workshop will be conducted in each LGU to review all funding sources for prevention of re-establishment of malaria. Counterpart funding from LGUs should include cash investment, and this should complement financing from external funds. Responsibility for funding operational expense items (including travel, salaries, laboratory consumables except RDTs) should be assumed by the LGUs and CHDs. The utilization of the PHP 1 million in grant assistance to each malaria-free province upon declaration of their subnational elimination status should be directed to operating their elimination hubs.

At the time of writing (mid-January 2020) it is possible to identify certain activities that according to formal and informal commitments and past experience will be funded by LGUs and by CHDs. In addition, a considerable volume of personnel costs for designated personnel are shouldered by LGUs.

The budget presented with this plan identifies items to be funded by LGUs, by CHDs and by the National Malaria Program, where the costs under National Malaria Program will need to be split among DOH Central, Global Fund and other partners.

It is foreseen that from the next Global Fund Grant, for the period 2021-2023, three provinces, the ones which had indigenous malaria cases in 2018, will be prioritized. They are Mindoro Occidental, Palawan, and Sultan Kudarat. In addition, it is expected that the Global Fund will continue support for the program at national level through financing several key positions, e.g. entomologist, laboratory technician, informatician, and development activities including information systems and research. A considerable proportion of the costs for commodities will be shouldered by DOH Central. However, for antimalarial medicines, GF has established a mechanism with UNICEF making it most practical to maintain funding of these products through the Fund.

Strategy 3.1 ***Secure sufficient government and non-government financial resources in support of malaria control and elimination***							
Indicator 3.1.1 DOH national budget for the malaria program is sustained, if not increased							
Year	**Baseline 2020**	**2021**	**2022**	**2023**			
Annual Target (PHP millions)	**223**	**>223**	**>223**	**>223**			
Indicator 3.1.2 Proportion of provinces cities following a cost-sharing scheme between DOH and LGUs							
Year	**Baseline 2018**	**2020**	**2021**	**2022**	**2023**		
Annual Target	**60%**	**80%**	**100%**	**100%**	**100%**		
Activity Areas, Indicative Activities and Timing							
Action Points		**2020**	**2021**	**2022**	**2023**		
1. Develop cost-sharing priorities between DOH and LGUs		■					
2. Advocate towards provinces and municipalities for incorporation of malaria interventions in their AOP		■	■	■	■		
3. Continue engagement of WHO and other development partners for technical assistance		■	■	■	■		

Objective 4 - To ensure quality malaria services, timely detection of infection and immediate response, and information and evidence to guide malaria elimination

The following strategies will be pursued to ensure the quality of malaria services and interventions, the timely detection of infection and immediate response and continued enhancement of the malaria elimination efforts based on evidence.

Strategy	Outcome or Output Indicator
Strategy 4.1 ***Ensure high quality malaria diagnosis and treatment, through effective quality assurance systems***	**Indicator 4.1.1** *Number and proportion of public health facilities providing microscopy services that participate in the QAS and, among them, the proportion that pass the QAS*
	Indicator 4.1.2 *Proportion of RDT batches procured that underwent validation and, among them, the proportion that passed validation*
	Indicator 4.1.3 *QA for case management and treatment– this is partially covered by indicators1.1.2 and 1.2.3, but additional activities are needed*
Strategy 4.2 ***Improve and maintain high quality and effective vector control measures***	**Indicator 4.2.1a** *Number of sites in Palawan, Mindoro Occidental and Sultan Kudarat conducting bioassay tests on LLINs, on sprayed surfaces*
Strategy 4.3 ***Strengthen malaria case surveillance and response systems in support of malaria elimination, according to the Malaria Surveillance and Response Strategy***	**Indicator 4.3.1** *Proportion of confirmed malaria cases notified within 24 hours of consultation*
	Indicator 4.3.2 *Proportion of confirmed malaria cases investigated and classified within 3 days of consultation*
	Indicator 4.3.3 *Proportion of foci investigated with appropriate response initiated within 5 days of case detection*
	Indicator 4.3.4 *Proportion of active and residual inactive foci reassessed annually*
	Indicator 4.3.5 *Proportion of population in three highest endemic municipalities in Palawan identified by mapping by the program in mid-2020 having undergone RDT test in annual mass survey around November (October – January) from 2020*
Strategy 4.4 ***Maintain effective Malaria Program monitoring and evaluation systems***	***Indicator 4.4.1*** *Number and proportion of annual provincial reports received at national level via RO*
	Indicator 4.4.2 *Number and % of monthly consolidated OLMIS/PhilMIS reports received from all provinces by the national Program (via RO)*
	Indicator 4.4.3 *Number and % of monthly feed-back bulletins on malaria issued by the Palawan Provincial Health Office*
	Indicator 4.4.4 *Highest incidence Southern Palawan municipalities monitored at least once per quarter by PHO Region 4B and national Program*
	Indicator 4.4.5 *Malaria Program performance reviewed annually, and end-of-Plan*
Strategy 4.5 ***Implement a research agenda in support of the plan's goal***	***Indicator 4.5.1*** *No. of planned research activities completed with reports disseminated and, among them, the number and proportion utilized within the national or sub-national program*

Strategy 4.1 Ensure high quality malaria diagnosis and treatment, through effective quality assurance systems

Diagnosis

For microscopy services, WHO WPRO has undertaken an assessment of the functionality of the EQA system, including training needs, during 2017-8 with a view to improving the reach and performance of the system and identifying the appropriate number and distribution of microscopists, validators and higher level QA personnel, and to address bottlenecks and constraints to roll-out of an enhanced and re-invigorated QAS. Participation in the DOH three-level QAS has been scaled up to all diagnostic facilities. The norm is now that each laboratory performing EQA undergoes EQA twice annually. The validation process is based on the maintenance of malaria slide banks and complemented by regular supervision visits from Regional DOH offices and Elimination Hubs to health facilities providing microscopy.

The quality of RDTs will to be tested through *in vitro* batch testing against blood specimens with known parasite content using a kit supplied by the manufacturer. A scheme based on these kits will be developed (Objective 2). This testing is meant to be carries out close to end-use sites, for example at municipality level.

Treatment

Ensuring quality of anti-malarial treatment begins with the adherence of procurement to the DOH-recommended anti-malarial drugs and maintaining current prohibition of the importation of artemisinin monotherapies.[12] Most of the imported antimalarial medicines are pre-qualified by WHO, so routine testing is not necessary. The Food and Drugs Administration (FDA) will continue to administer lot / batch testing for primaquine prior to distribution to facilities. Compliance of service providers to treatment protocols is monitored, through OLMIS, and local health authorities will increase efforts to ensure inclusion of private providers (See strategy 1.1, indicators 1.1.1 and 1.1.2).

Therapeutic efficacy studies (TES) performed in sentinel sites by RITM and RHU personnel on behalf of the Program will continue to be supported as the basis for detecting emerging resistance reviewing treatment protocols and make updates as necessary. They are included with budget under 4.5., research agenda.

Strategy 4.1 ***Strengthen QAS for anti-malaria diagnostics and treatment facilities***							
Indicator 4.1.1a. Number and proportion of public health facilities providing microscopy services that participate in the QAS for each category							
Year	**Baseline 2018**	**2020**	**2021**	**2022**	**2023**		
Annual Target	**18% (346/1933)**	**90%**	**100%**	**100%**	**100%**		

[12] DOH Administrative Order 2009-0001: Revised Policy and Guidelines on the Diagnosis and Treatment of Malaria.

Indicator 4.1.1b Proportion of public health facilities participating in QAS that passed QA for each category							
Year	**Baseline 2018**	**2020**	**2021**	**2022**	**2023**		
Annual target	84% (289/346)	90%	95%	95%	95%		
Activity Areas, Indicative Activities and Timing							
Action Points		**2020**	**2021**	**2022**	**2023**		
1. Continued conduct of QA led by validators from all provinces, and Regions and 7 CCs to cover all malaria microscopy services, about 630, twice a year		■	■	■	■		
2. Maintenance of slide banks with increased sourcing from Palawan		■	■	■	■		
3. Validation and onsite visits		■	■	■	■		

Indicator 4.1.2 Proportion of RDT batch procured that underwent and passed validation							
Year	**Baseline 2018**	**2020**	**2021**	**2022**	**2023**		
Annual Target	**No data**	**100 %**	**100 %**	**100 %**	**100 %**		
Activity Areas, Indicative Activities and Timing							
Action Points		2020	2021	2022	2023		
1. Orientation of RHUs, Hospitals on RDT QA (by DOH-RO validators)		■	■				
2. Conduct validation of RDTs in each RHU and hospital, where they are distributed by RHU staff		■	■	■	■		

Indicator 4.1.3 QA for case management and medicines						
Activity Areas, Indicative Activities and Timing						
Action Points	2020	2021	2022	2023		
1. Conduct quality testing for any imported antimalarial not pre-qualified by WHO (FDA)		■		■		
2. Conduct malaria mortality review for all indigenous and all imported case deaths	■	■	■	■		
3. On-site validation of treatment compliance in Palawan (by quarterly monitoring visits)	■	■	■	■		
4. Conduct of therapeutic efficacy studies (TES) with first-line treatment in use and potential second-line treatment (RITM)	■		■			

Strategy 4.2 Maintain high quality and effective vector control measures

Built-in QA mechanisms for vector control measures include the regular conduct of bioassay tests on used LLIN and sprayed surfaces. Bio-assay tests on LLINs will be conducted only in Palawan, while bioassay testing after IRS will be conducted in every province, where IRS is implemented routinely.

In the high-endemic municipalities of Palawan, the quality of IRS will be monitored by post-spray monitoring led by the sprayman supervisor.

The other part of Strategy 4.2 is vector surveillance including susceptibility testing at two sentinel sites in the high endemic municipalities in southern Palawan, and every two years in one site per Region in Provinces with 0 indigenous malaria cases. This is budgeted under Research (4.5).

Strategy 4.2 **Improve and maintain high quality and effective vector control measures**					
Indicator 4.2.1a *Number of sites in Palawan, Mindoro Occidental and Sultan Kudarat conducting bioassay tests on LLINs (Palawan only) and on sprayed surfaces (all three provinces)*					
Year	**Baseline 2018**	**2020**	**2021**	**2022**	**2023**
No. sites Annual Target LLINs/ IRS	**3/5**	**3/5**	**3/5**	**3/5**	**3/5**
Activity areas, indicative activities and timing					
Action Points		**2020**	**2021**	**2022**	**2023**
1. Provide training on bioassay by RITM		■			■
2. Conduct bioassay tests in Palawan, M.O. and S.K. on LLINs and in sprayed sites		■	■	■	■
3 Batch quality testing for LLINs		■	■	■	■

Strategy 4.3 Strengthen malaria case surveillance and response systems in support of malaria elimination, according to the Malaria Surveillance and Response Strategy

Case notification and reporting

In 2020, malaria will be upgraded from Category 2 to Category 1 in the EB system, which mandates that all cases should be reported from all facilities (including the private sector) within 24 hours. This will be handled in practice through OLMIS. Areas with API >1/1000 are exempted.

Reports to the on-line PIDSR portal will be transmitted simultaneously to PHO, RO and DOH Central levels.

Zero reporting by month must be complied with by municipalities and provinces.

Case and focus investigation

Elimination Hub teams will investigate any cases detected according to national Guidelines within 3 days, classify them to distinguish indigenous from imported cases and, mobilize any necessary intervention as appropriate.

Known or emerging foci of transmission will be investigated and re-assessed at least annually (according to the updated MOP) and recorded on a local elimination register maintained by the Hub, with onward transmission to the national elimination information system maintained by the Program at its Central Office.

Specific activities for Palawan

Every year, in the low transmission season (October-January, optimally in November), proactive ACD will be implemented as a mass blood survey encompassing the three most endemic municipalities, Bataraza, Brooke's Point and Rizal. The diagnostic method will be RDT. All positive cases will be treated.

From 2020, a monthly Palawan malaria feed-back bulletin will be produced by the Provincial Health Office and sent to all municipal health offices in the Province and to the barangays in the highly endemic municipalities, as well as to DOH. The purpose is to rapidly inform municipalities about changes anywhere in the Province and to highlight problems, successes and good examples.

Strategy 4.3 **Strengthen malaria case surveillance and response systems for malaria elimination, according to the Malaria Surveillance and Response Strategy**							
Indicator 4.3.1 Proportion of confirmed malaria cases notified within 24 hours of consultation							
Year	**Baseline 2018**	**2020**	**2021**	**2022**	**2023**		
Target	**30%**	**80%**	**90%**	**90%**	**90%**		
Indicator 4.3.2 Proportion of confirmed malaria cases investigated and classified within 3 days of notification							
Year	**Baseline 2018**	**2020**	**2021**	**2022**	**2023**		
Target: Proportion of cases investigated and classified within 3 days of notification	**38%**	**80%**	**90%**	**100%**	**100%**		
Indicator 4.3.3 Proportion of foci investigated with appropriate response initiated within 5 days of case detection							
Year	**Baseline 2018**	**2020**	**2021**	**2022**	**2023**		

Target	14%	30%	50%	80%	90%		

Indicator 4.3.4 Proportion of active and residual foci reassessed annually

Year	Baseline 2018	2020	2021	2022	2023		
Target	No data	50%	100%	100%	100%		

Activity Areas, Indicative Activities and Timing

Action Points	2020	2021	2022	2023		
1. Re-Orient staff on and Malaria Surveillance and Response Strategy together with surveillance, M&E, and supervision	■	■	■	■		
2. OLMIS Reporting (morbidity/mortality cases, case investigation, focus investigation) in all provinces. Reproduction and distribution of registries and forms	■	■	■	■		
3. Investigate and respond	■	■	■	■		
4. Mapping and monitoring of known foci for transmission and annual classification/ reclassification	■	■	■	■		
5. Malaria upgraded to Category 1 notifiable disease in Epidemiology Bureau system (immediate reporting)	■					

Indicator 4.3.5 Proportion of population in three highest endemic municipalities in Palawan identified by mapping by the program in mid-2020 having undergone RDT test in annual mass survey in November from 2020

Year	Baseline 2018	2020	2021	2022	2023		
Target	-	90%	90%	90%	90%		

Activity Areas, Indicative Activities and Timing

Action Points	2020	2021	2022	2023		
1. Ensure necessary supplies of diagnostics, medicines.	■	■	■	■		
2. Train personnel	■	■	■	■		
3. Hold meeting with stakeholders and representatives of the populations	■	■	■	■		
4. Conduct the survey within November	■	■	■	■		

5. Follow up treatment, sound out the population's reaction	■	■	■	■		
6. Analyze data, produce prevalence maps	■	■	■	■		
7. Preparation and distribution of monthly feed-back bulletin on malaria in Palawan	■	■	■	■		

Strategy 4.4 Maintain effective Malaria Program monitoring and evaluation systems

Systems for Routine Program monitoring and reporting have been enhanced and an on-line reporting system for M&E established. New modules (registries) help the Program to monitor laboratory activity, patient flow-through, output reporting for vector control activities (LLIN distribution and IRS), capacity building and training, commodities and logistics (stock level monitoring), and monitoring financial utilization (i.e. central sub-allotments to sub-national level). The system is functional but awaits official approval. The system also makes it possible to monitor zero reporting from all provinces and municipalities every month.

Existing routine data bases (*PhilMIS*) are being replaced by the online system, OLMIS. Trainers from CHDs have been trained. Within 2020, OLMIS will have been rolled out countrywide to be the single source of malaria surveillance data. This system includes case and focus investigations.

Indicator 4.4.1 No. and proportion of expected provincial reports received at national level via DOH-RO (all provinces)							
Year	**Baseline 2018**	**2020**	**2021**	**2022**	**2023**		
Number and % of provincial annual malaria reports received by the national Program (via RO)	n.a.	50	81	81	81		
Indicator 4.4.2No. and proportion of of monthly consolidated OLMIS/PhilMIS reports received from all provinces by the national Program (via RO) (all provinces)							
Year	**Baseline 2018**	**2020**	**2021**	**2022**	**2023**		
Number and % of provincial monthly malaria reports received by the national Program (via RO)	n.a.	50x12	81x12	81x12	81x12		
Activity Areas, Indicative Activities and Timing							
Action Points		**2020**	**2021**	**2022**	**2023**		
1. Roll-out training for OLMIS		■	■				
2. Quarterly data review sessions: PHO malaria Coordinator in 8 provinces		■	■	■	■		
3. Annual OLMIS updates and users' conference		■	■	■	■		
4. Procurement of android devices and desktop computers			■				

An integrated monitoring of the Program will be pursued using the integrated DOH M&E Monitoring Tool. M&E will be organized at the national level and in each region and Province (or City).

Joint monitoring by external and local groups of stakeholders is also encouraged for wider coverage and an integrated, inclusive view of the Program in the context of the local health system and multi-stakeholder inputs. Southern Palawan municipalities that currently have a high incidence of malaria will be especially targeted for supervisory outreach from the national, regional and provincial level to ensure sound implementation of strategies.

Annual (mid-year), internal Malaria Program reviews will be convened by the central unit.

The progress and status of the implementation of the 2020-22 Strategic Plan will be evaluated at end-of-term (late 2022).

Indicator 4.4.3 Highest incidence Southern Palawan municipalities monitored at least once per quarter by PHO Region 4B and national Program							
Year	**Baseline 2018**	**2020**	**2021**	**2022**	**2023**		
Joint field supervisions	n.a.	4	4	4	4		
Indicator 4.4.4 Malaria Program performance reviewed annually, and end-of-Plan							
Year	**Baseline 2018**	**2020**	**2021**	**2022**	**2023**		
Program Review Reports approved by IDO and TWG	0	1	1	1	2		

Activity Areas, Indicative Activities and Timing							
Action Points		**2020**	**2021**	**2022**	**2023**		
1. PIR							
1.1 National with ROs	■	■	■	■			
1.2 DOH-ROs with Province/ Municipalities	■	■	■	■			
1.3 Province with municipalities	■	■	■	■			

Strategy 4. 5. Implement a research agenda in support of the plan's goal

Strategy 4.5 is the conduct of special surveys and research to enrich the pool of data and evidence needed in moving the elimination process forward. An operational research agenda for the Malaria Program developed collaboratively as part of this NSP includes the following:

Topic	**Rationale**	**Timeline**	**Implementing agency /Partner**

1. Assessment of the community acceptability of a long-acting formulation of an organophosphate	Organophosphates have a distinctive smell and have not been used in Palawan for years. It is therefore important to gauge the reaction of community and spraymen	February - March 2020	Provincial Health Office, Palawan Community Organizers + Region 4B IRS staff and PSFI
2. Assessment of DEET impregnated anklets and wristbands followed by implementation, if supported by evidence (details – see below)	Novel method developed in Malaysia. Thought to be suitable in Southern Palawan, but evidence on acceptability, entomological and epidemiological impact needed	February 2020 – December 2021	RITM (Palawan unit) with PHO and PSFI supported by research entomologist (possibly Ph.D. student) funded by GF through WHO
3. Longitudinal entomological study of biting and resting habits of different vectors in a deep forest and a forest fringe site with relationship with human ecology in southern Palawan lasting for 12 months	Biting times, relationship between agricultural activities and importance of different vector species are still not well understood and have implications for the potential role of additional new methods such as spatial repellants and possible intersectoral action	July 2020 – June 2022	Research entomologist (see 2). In collaboration with RITM Palawan unit
4. "Bednet" Utilization Surveys (BUS) every two years in the four high-endemic municipalities in southern Palawan	Main method for assessing actual use. Methodology used so far to be adapted to provide evidence on possible advantage of conical single-person nets	2020 and 2022	Research institution to be selected through bidding
5. Community sample surveys with highly sensitive techniques in provinces, where malaria has apparently been recently eliminated	Several such surveys have already provided reassuring evidence of no residual parasitemia. There is a need in some provinces in southern Mindanao, which cannot be thoroughly assessed by senior program staff for security reasons and in Occidental Mindoro, where an unexpected focus of *P.malariae* was detected (and apparently eliminated) in 2017.	2020-23	Research institution to be selected through bidding
6. Study on the epidemiology of *P.knowlesi* in Palawan in collaboration with University of Malaya, Kuala Lumpur, by sending filter paper samples from all cases diagnosed as *P.malariae* by microscopy, and comparing epidemiological	Based on previous studies, it was thought that *P. knowlesi* is rare in Palawan. However, this species was recently detected in two samples sent to university of Malaysia. There is a suspicion that some cases of	2020-22	University of Malaya, Kuala Lumpur

characteristics in case-control design	severe malaria where *P.falciparum* and *P.malariae* were found together may actually have been *P.knowlesi*		
7. TES studies: a) In 2020 to include pyronaridine-artesunate as a potential 2nd line treatment. b) In 2022 to include dihydroartemisinin-piperaquine as a potential candidate for future use	Always needed to ensure efficacy. There is now a need for a second-line treatment other than quinine-doxycycline. Mass treatment could be considered in the future, once prevalence is below 2-5%, possibly in 2023	2020, 2022	RITM. This is also included under indicator 4.1.3, quality assurance of case management
8. Insecticide susceptibility testing every year in 5 sites in Palawan, every third year in all other provinces	With the intense use of pyrethroids for malaria control and all kinds of purposes across sectors, close monitoring of susceptibility is essential. Also included under 4.2.1b, quality assurance for vector control	Annually	RITM in collaboration with collaborating centers and other CHDs.
9. Bio-assay testing every year in Palawan following IRS at 1 and 6 months	This should be a routine program activity (see 4.2.1b), but is for the time included under research, as there is a need for technical strengthening.	Annually	RITM in collaboration with collaborating centers and other CHDs.

Research on repellent-impregnated ankle- and wristbands (topic 2 in Table).

There is good evidence on the effectiveness of this tool to repel *An. maculatus* in Malaysia.[13] This vector is also found in the Philippines, but it will be essential to study the effectiveness and acceptability and eventually the epidemiological effectiveness of this tool under local conditions in Palawan, where in most areas, *An .flavirostris* and *An. balabacensis* are more important vectors. The protocol must include sequential steps as follows:

a) Entomological assessment in laboratory with insectary mosquitoes in Puerto Princesa combined with trying out different materials and reimpregnation methods – February 2020
b) Field entomological assessment of effect including real-life-like simulations with wearers and non-wearers – March 2020
c) Joint assessment with the affected communities of the acceptability and design of implementation arrangements – April 2020
d) Roll-out in one barangay in each of the three most affected municipalities –June – July 2020 followed by survey on usage and acceptability
e) Large-scale implementation in one of the he four high-endemic municipalities from January 2021 with assessment of impact, the other municipalities serving as controls in addition to before-after comparison (stepped wedge design)
f) Large-scale implementation in all four high-endemic municipalities from January 2022

[13] Chiang GL & Eng KL (1990). Field Trials on the Efficacy of DEET Impregnated Anklets and Wristbands against Mosquito Vectors of Disease in Malaysia. *Journal of Bioscience*, 1 (2), 113-117

Implementation Arrangements

DOH-IDO is the lead, and coordinates the assistance of other DOH offices (e.g. EB, National Center for Health Promotion [NCHP], HHRDB, etc.) and development partners in the management and implementation of the planned activities. The existing TWG and sub-thematic working groups will provide technical direction in the implementation of the Plan.

At the National Level

The National Malaria Program Manager will be responsible for managing all Government of the Philippines (GOP) and donor-funded activities to ensure that all resources and assistance allotted will be utilized efficiently, effectively and according to the approved Strategic Plan.

At the Sub-national Level

The Regional Malaria Program Coordinators (RMPC) in each RO is responsible for coordinating all regional level activities towards malaria elimination. They are expected to coordinate with other CHDs and with personnel involved in the Malaria Program, particularly the regional entomologists, sanitary engineer, medical technologist, the Health Education and Promotion Officers, and the RESU.

The RMPCs will be mandated to oversee both GOP- and externally-funded malaria activities within their region, and ensure that resources and activities are synchronized to effect better malaria outcomes. Each RO will be encouraged and supported to establish a multi-sectoral coordination group to encourage non-DOH development partners and those in the private sector to participate and become involved in malaria elimination.

At the Local Level

The LGUs will lead in the provision of anti-malaria services to their catchment population. The existing coordination committees currently established in various provinces through the current Global Fund grant are being expanded to cover malaria program-wide issues. Their agenda should not be limited only to Global Fund resourced activities, but will include all Malaria Program related concerns, regardless of how they are funded.

Designated Provincial Malaria Coordinators will coordinate management and implementation of the Plan in their respective localities.

Sustainability Considerations

Rationale

Annual health expenditure per capita in the Philippines was USD 135 in 2015 – about 4.9% of gross domestic product, an increase from 4.1% of GDP in 2010.

Within the health budget, the Malaria Program benefits from specially earmarked funds for disease elimination. Though the Disease Prevention and Control Bureau and IDO, it is also able to bid for special, additional funding derived from the Sin Tax Reform Law.

The World Bank classifies the Philippines as a lower-middle income country, which carries a 50% co-financing requirement when negotiating with the Global Fund. It also signals that the Philippines Malaria Program may be expected to graduate soon from intensive donor support through the Global Fund and similar mechanisms, on the basis of a combination of economic growth and reduced burden of disease.

Approach

Sustainability, transition and co-financing aspects of the Program can be understood through 6 domains that approximate to the WHO health system building blocks: malaria financing; leadership; service delivery; workforce; information systems; and planning and management.

Financing

The DOH annual budget for malaria increased from PHP 212.3 million in 2013 to PHP 320.0 million in 2015 and 2016. The Government allocation represented more than 50% of the estimated annual budgetary requirement under the NSPCEM 2014-20, including alignment with program reorientation to address elimination targets.

The funding requirements of the NSPCEM 2017-2022 have been costed through to 2023; Various sets of assumptions have been made about the funding gap.

The principal factors supporting increased centrally derived funds for malaria and other public health programs have been the Sin Taxes and broader economic growth. The DOH is well placed to meet the Global Fund co-financing requirements for continuation funding for 2018-2020.

Within the DOH, sub-allotment funds are available from the NSPCEM to Regional Health Offices. Disbursement and funding flow to peripheral levels may be unpredictable, although they are increasingly based on costed regional work plans and this improves alignment with predicted expenditure needs.

At the provincial and municipal level, LGUs have more limited financial resources and the devolved health system creates barriers between the DOH and LGUs. Disbursement of DOH funds may be slow and, in Global Fund sites, the PR may step in to fill these gaps.

There is no comprehensive central tracking of malaria expenditure at different levels and from different sources of funding, which obscures the efficient allocation of funds, tracking of malaria expenditure at all levels of the system, and the anticipation of future gaps.

Leadership (including political commitment)

The Philippines has joined other ASEAN countries in committing to eliminate malaria from the Asia-Pacific region by 2030. This is reflected in the vision of the updated NSPCEM: a malaria-free Philippines by 2030.

The DOH has responded to national level leadership needs by appointing a full-time Malaria Program coordinator. However, it has still not committed to addressing other HR and leadership related recommendations from the last two malaria program reviews. If this situation continues, there will be a continuing need for WHO and other partners to maintain high level technical support for DOH and the control and elimination of malaria.

At sub-national level, local chief executives have an important role in determining the financing, visibility, and support that the malaria program needs (and receives). With frequent changes of administration, it is important to create policies that institutionalize the support that malaria elimination needs.

Annex 1. Philippines Stratification, 2018

Province	Total No of Municipalities/Cities	Total No of Barangays	Total Population 2018	Confirmed Malaria Cases 2018	Barangays with Active Transmission, 2018	Barangays with Residual Non Active Transmission, 2018	Population at Risk, 2018
Occidental Mindoro	11	164	507,630.00	11	4	7	46,158
Sultan Kudarat	12	249	850,552.00	44	6	23	83,598
Palawan	24	433	1,170,905.00	4749	151	77	677,487
TOTAL	**47**	**846**	**2,529,087.00**	**4804**	**161**	**107**	**807,243**

Annex 2. Palawan Stratification, 2018

Municipalities	Total No of Barangays	Total Population 2018	Confirmed Malaria Cases 2018	Barangays with Active Transmission, 2018	Barangays with Residual Non Active Transmission, 2018	Population at Risk, 2018
ABORLAN	19	37,198	50	7	9	31,556
BALABAC	20	42,552	418	19	1	42,552
BATARAZA	22	79,999	382	21	1	79,999

Municipalities	Total No of Barangays	Total Population 2018	Confirmed Malaria Cases 2018	Barangays with Active Transmission, 2018	Barangays with Residual Non Active Transmission, 2018	Population at Risk, 2018
BROOKE'S POINT	18	70,359	207	16	2	70,359
CITY OF PUERTO PRINCESA (Capital)	66	76,082	155	27	21	73,270
EL NIDO (BACUIT)	18	44,104	5	5	2	15,520
NARRA	23	77,608	28	9	11	74,180
QUEZON	14	69,084	271	12	2	69,084
RIZAL (MARCOS)	11	54,476	3093	11	0	54,476
ROXAS	31	69,282	16	7	12	51,185
SAN VICENTE	10	33,107	21	5	3	30,489
SOFRONIO ESPAÑOLA	9	34,850	97	8	1	34,850
TAYTAY	31	79,678	6	4	12	49,967
TOTAL	**292**	**768,379**	**4749**	**151**	**77**	**677,487**