

The following document is an abbreviated malaria operational plan. The principles guiding development of this document—country-led, inclusive, consultative with a broad audience, and transparent—are consistent with best practices that the U.S. President’s Malaria Initiative (PMI) has instituted since its inception. While an in-depth background of malaria in this country can be found in the detailed [FY 2018 malaria operational plan](#) on [pmi.gov](#), this abbreviated document provides a high-level overview of PMI’s program in this country, including key strategic updates, country data and progress updates, and a detailed list of activities to be supported with FY 2019 U.S. Government PMI funding.

This abbreviated malaria operational plan has been approved by the U.S. Global Malaria Coordinator and reflects collaborative discussions with the national malaria control programs and partners in country. The final funding available to support the plan outlined here is pending final FY 2019 appropriation. If any further changes are made to this plan it will be reflected in a revised posting.



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## U.S. PRESIDENT’S MALARIA INITIATIVE



# **PRESIDENT'S MALARIA INITIATIVE**

## **Cambodia**

### **Abbreviated Malaria Operational Plan FY 2019**

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## **ABBREVIATIONS and ACRONYMS**

|             |  |
|-------------|--|
| ACT         | Artemisinin-based combination therapy                    |
| AS-MQ       | Artesunate-mefloquine                                    |
| BMGF        | Bill & Melinda Gates Foundation                          |
| CDC         | Centers for Disease Control and Prevention               |
| CNM         | National Malaria Center                                  |
| CMEP        | Cambodia Malaria Elimination Project                     |
| CMS         | Cambodia Malaria Survey                                  |
| DHS         | Demographic and Health Survey                            |
| DOT         | Directly observed therapy                                |
| FETP        | Field Epidemiology Training Program                      |
| FY          | Fiscal year  |
| Global Fund | Global Fund to Fight AIDS, Tuberculosis and Malaria      |
| G6PD        | Glycose-6-phosphate dehydrogenase enzyme testing         |
| IPTp        | Intermittent preventive treatment for pregnant women     |
| IRS         | Indoor residual spraying                                 |
| ITN         | Insecticide-treated mosquito net                         |
| LLIHNs      | Long-lasting insecticide treated hammock nets            |
| LLINs       | Long-lasting insecticidal nets                           |
| MEAF        | Malaria Elimination Action Framework                     |
| MIP         | Malaria in pregnancy                                     |
| MIS         | Malaria Indicator Survey                                 |
| MoH         | Ministry of Health                                       |
| MOP         | Malaria Operational Plan                                 |
| ODs         | Operational districts                                    |
| PHD         | Provincial health department                             |
| PMI         | President's Malaria Initiative                           |
| RAI2e       | Regional Artemisinin-resistance Initiative 2 elimination |
| RDT         | Rapid diagnostic test                                    |
| SBCC        | Social and behavior change communication                 |
| SMC         | Seasonal Malaria Chemoprevention                         |
| SM&E        | Surveillance, monitoring, and evaluation                 |
| TES         | Therapeutic efficacy surveillance                        |
| UNOPS       | United Nations Office for Project Services               |
| USAID       | United States Agency for International Development       |
| VMWs        | Village malaria workers                                  |

## **I. INTRODUCTION**

This abbreviated fiscal year (FY) 2019 Malaria Operational Plan (MOP) presents an implementation plan for Cambodia, based on the strategies of the U.S President’s Malaria Initiative (PMI) and the National Malaria Center (CNM) and building on investments made by PMI and other partners to improve and expand malaria-related services. It was developed in consultation with the CNM and with the participation of national and international partners involved in malaria prevention and control in the country. The [FY 2018 MOP](#) contains a more detailed and comprehensive description of the malaria situation in Cambodia, country health system delivery structure, Ministry of Health (MoH) organization, and PMI’s progress through April/May of 2017. This abbreviated MOP describes critical changes/updates to overall CNM and PMI strategic approaches, as well as newly proposed activities under each technical area to be supported with FY 2019 funds.

## **II. OVERVIEW OF PMI IN CAMBODIA**

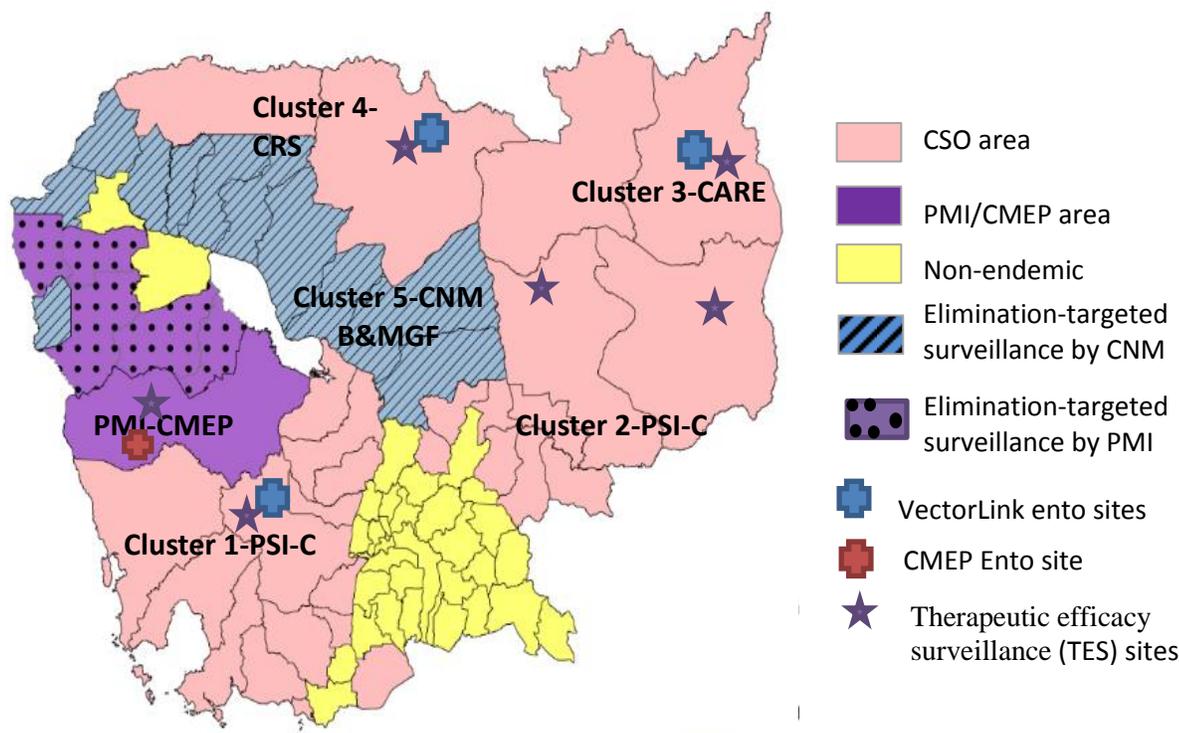
Cambodia began implementation as a PMI focus country in FY 2012. The proposed FY 2019 PMI budget for Cambodia is \$9 million.

The activities that PMI is proposing to support with FY 2019 funding align with the Malaria Elimination Action Framework (MEAF) 2016–2020, and build on investments made by PMI and other partners, including the Global Fund to Fight AIDS, Tuberculosis, and Malaria (Global Fund), and investments from the Bill & Melinda Gates Foundation (BMGF) to improve and expand malaria-elimination activities.

PMI will work with the National Malaria Center (CNM) to support ongoing elimination activities in Battambang and Pailin Provinces in Western Cambodia, and to transition to elimination activities in Pursat Province, when the epidemiologic conditions and health system capacity make it feasible. Support for establishment of elimination activities will also be expanded to two to five additional operational districts (ODs) in contiguous neighboring provinces in Western Cambodia. Selection of these ODs, which will be done in consultation with CNM, will be based on the epidemiologic conditions and system readiness to conduct elimination activities. In FY 2019, PMI will also support limited commodity gap filling, and provide technical assistance for surveillance, case management, supply chain management, social and behavior change communication (SBCC), and capacity building for malaria elimination in Cambodia. In addition, PMI will support quality assurance of laboratory diagnosis, surveillance for antimalarial drug resistance, insecticide resistance, and vector monitoring activities.

The main donors in Cambodia are Global Fund, PMI, and BMGF. The Global Fund has been the major donor for malaria control since 2005. A new Regional Artemisinin-resistance Initiative 2 Elimination (RAI2e) grant for 2018–2020 has been initiated by the Global Fund, with the United Nations Office for Project Services (UNOPS) being the principal recipient. The Global Fund-supported activities have been divided geographically into five clusters; four clusters are supported by one of the four civil society organizations. The fifth cluster is designated as a malaria elimination area and the activities are to be implemented by CNM, with technical assistance from the BMFG (See Figure 1).

**Figure 1: Geographic Distribution of Malaria Partners in Cambodia 2018-2020**



| Funding Source (implementing partner(s))  | Number of Provinces         |                       |
|---|-----------------------------|-----------------------|
|   | Core Intervention Package * | Elimination Package** |
| Global Fund- (CNM + BMGF)                 | 5                           | 19                    |
| Global Fund- (CSOs- CRS, Care & PSI-C)*** | 14                          | 0                     |
| PMI- (USAID CMEP Project)                 | 3                           | 2                     |

\* Core intervention package includes support for scaling up long-lasting insecticidal nets (LLINs) and Village Malaria Workers (VMWs), who provide diagnostic and treatment services at village level; and for capacity building and SBCC activities in the targeted areas.

\*\* Elimination Package includes activities above plus implementation of surveillance for elimination, including individual case reporting, investigation, and follow-up.

\*\*\* CSO- Civil Society Organizations; CRS- Catholic Relief Services; PSI-C- Population Services International- Cambodia

PMI is the second largest donor supporting malaria control and elimination activities in Cambodia. It plays a key role in directly engaging each of the main donors to coordinate activities and leverage funding to more efficiently support CNM’s control and elimination activities. The BMGF supports CNM through technical assistance and capacity building on surveillance, monitoring and evaluation.

### **III. STRATEGY UPDATES**

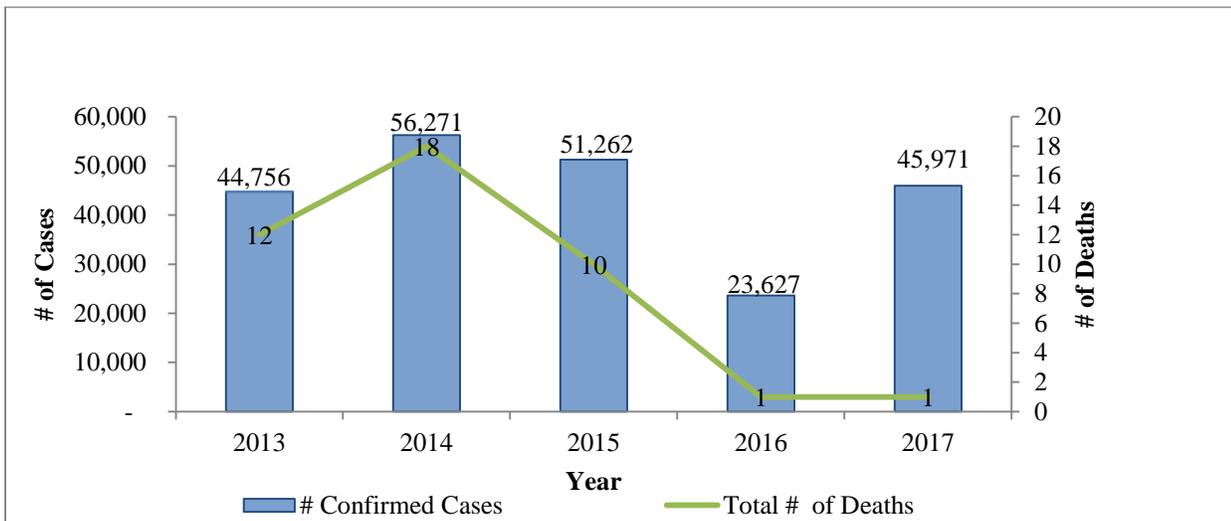
In FY 2018, CNM will implement malaria elimination activities in five provinces in Northwest Cambodia where surveillance activities will be intensified to follow up on cases, investigate focal areas, and conduct response interventions. The five provinces are Banteay Meanchey, Kampong Chhnang, Kampong Thom, Pailin and Siem Reap. CNM has updated its policy guidance to use artesunate-mefloquine (AS-MQ) as the first-line treatment for the entire country, and initiated national scale up of single, low-dose primaquine for the treatment of *P.falciparum* in elimination areas. In FY 2018, PMI-funded elimination activities will expand to Pailin Province at the request of CNM.

### **IV. DATA UPDATES AND EVIDENCE OF PROGRESS**

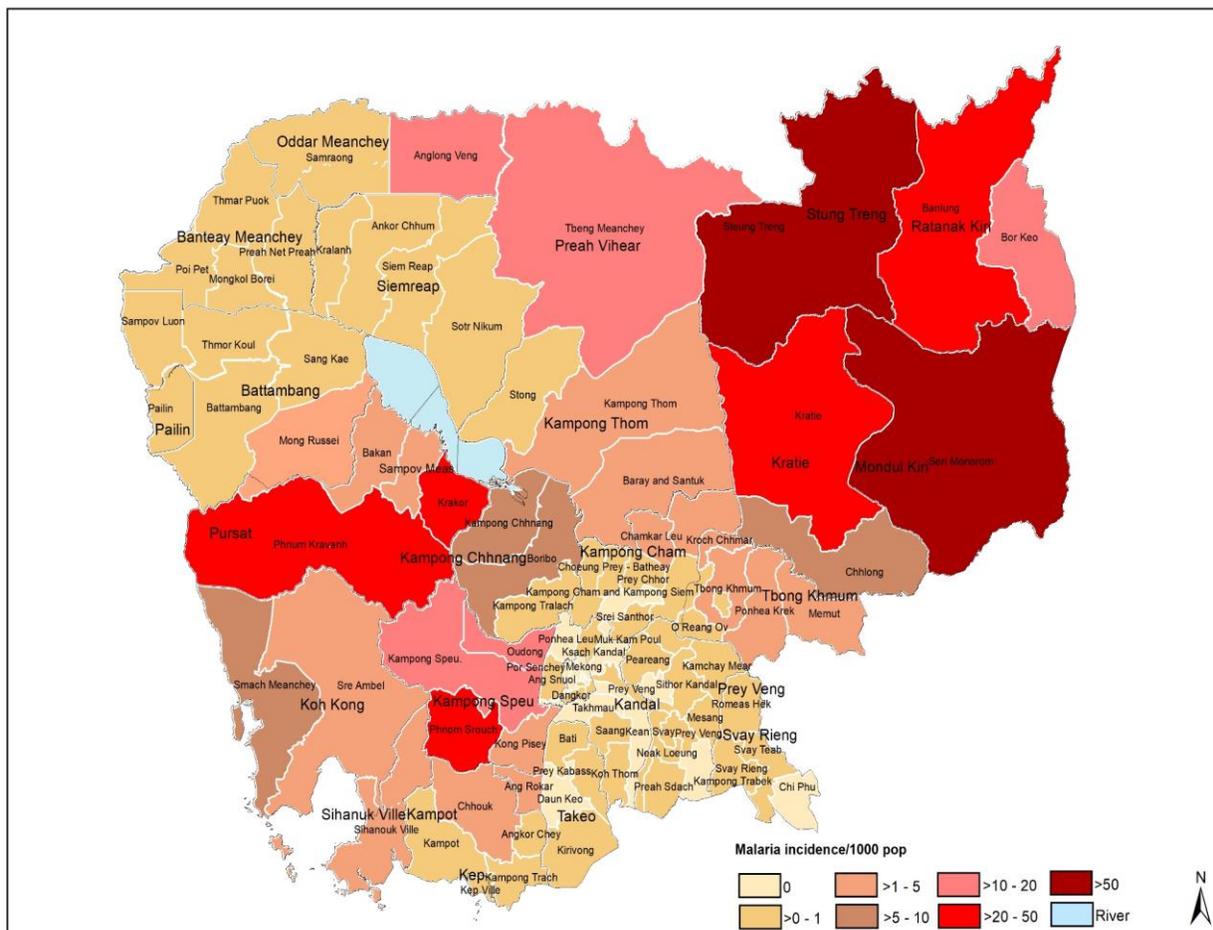
Over the last decade, malaria deaths have decreased dramatically by 95.4 percent—219 deaths in 2009 to only 1 death in 2017. Malaria cases treated at public facilities and by village malaria workers (VMWs) also declined from 71,814 cases in 2009 to 23,627 cases in 2016. This resulted in a decrease in malaria incidence in the public sector from 5.2 cases per 1,000 population to 1.5 cases per 1,000 population, respectively. In 2017, malaria case reports nearly doubled to 45,971 cases, as compared to 23,627 cases in 2016. This increase was primarily reported in six provinces in Northeastern Cambodia (Stung Treng, Ratanakiri, Mondulhiri, Kratie, Preah Vihear and Oddar Meanchey Provinces) and three provinces in Western Cambodia (Pursat, Kampong Spou, and Kampong Chhnang). This increase in case reports was attributable to multiple factors, and was coincident with an interruption of some malaria control activities in the higher burden provinces, resulting from delays in implementation of the Global Fund RAI grant. The halting of many malaria activities in the Global Fund-supported areas, particularly village-level case management services, likely resulted in an increase in malaria burden due to delays in care-seeking care, poor quality care in the private sector, and reduced access to preventative interventions. In addition, there was likely a decrease in reporting of cases in 2016 resulting from reduced staffing in the Global Fund supported areas. Although malaria case reports in 2015 and 2017 were at similar levels, the case reports in 2016 decreased significantly. This would seem to indicate that the increase in reported cases in 2017 may have been, to some degree, an artifact of decreased case reporting in 2016. Other factors that could have contributed to the increase in cases in 2017 include net attrition and end of their useful life due to wear and tear of the long-lasting insecticidal nets (LLINs) distributed in 2014 and 2015. Nevertheless, case reports in 2017 remained below the level reported in 2015 and previous years (Figure 2 and 3). Figure 4 shows that the majority of Cambodia's malaria burden is in the northeastern part of the country.

In contrast to the national increase, reported malaria cases in PMI-supported province of Battambang remained at very low levels in 2017, largely unchanged from 2016. In Sampov Loun OD, where PMI began implementing elimination activities in 2015, zero indigenous malaria cases have been reported since March 2016.

**Figure 2 and 3: Reported Malaria Cases (all ages, public health facilities and village malaria workers) and Deaths, 2013–2017**



**Figure 4: Malaria Incidence by Operational Districts (ODs) in Cambodia—2017**



Data source: CNM/ Malaria Information System

In 2017, the Cambodia Malaria Survey (CMS) was completed. However, preliminary data from the survey have not yet been released by CNM (Table 1).

**Table 1: Evolution of Key Survey-Based Malaria Indicators Through Malaria Surveys in Cambodia from 2004 to 2017**

| <b>Indicator</b>  | <b>2004</b> | <b>2007</b> | <b>2010</b> | <b>2013</b> | <b>2017**</b> |
|---|-------------|-------------|-------------|-------------|---------------|
| Malaria prevalence by microscopy (%)  | 4.4         | 2.6         | 0.9         | 0.1*        |               |
| Households with at least one mosquito net (%)                               | 95          | 100         | 99.4        | 99.7        |               |
| Households with at least one ITN (%)  | 35.8        | 42.6        | 74.7        | 89.5        |               |
| People who slept under an ITN the previous night (%)                        | 29.3        | 25.3        | 52.6        | 59.6        |               |
| Children under five years old who slept under an ITN the previous night (%) | 26.4        | 28.0        | 56.3        | 63.3        |               |
| Pregnant women who slept under an ITN the previous night (%)                | 13          | N/A         | 59.1        | 61.5        |               |

\*1.5% prevalence by PCR \*\* Final report not yet publically available.

## **V. NEW OR EXPANDED ACTIVITIES AND KEY CHANGES**

### **1. Vector control**

#### **a. Entomologic monitoring and insecticide resistance management**

In PMI-supported, Cambodia Malaria Elimination Project (CMEP) areas of Western Cambodia, PMI will continue to fund entomological surveillance at one site in Pursat Province, and provide support for entomological monitoring as part of foci investigations. In the non-CMEP areas, PMI will continue routine entomological monitoring in three high-burden provinces: Mondulkiri, Stung Treng, and Kampong Spou. Activities in these provinces will include monitoring of species abundance and seasonality, vector behavior, pyrethroid resistance in the primary malaria vectors, and capacity development of provincial health department staff in vector control and monitoring.

#### **b. Insecticide-treated nets**

PMI will procure approximately 150,000 LLINs in selected ODs, to be distributed primarily through health centers and VMWs to fill potential gaps, and 75,000 long-lasting insecticide treated hammock nets (LLIHNs) targeting migrant and mobile populations (including forest rangers and forest communities) in malaria endemic ODs nationwide. If required, LLINs/LLIHNs may also be distributed as part of malaria case/foci investigations.

In 2017, Cambodia recorded an increase in the number of malaria cases. One potential explanation for this could be the timing of the mass campaign; since the last campaign occurred in 2014-2015, there would likely be net attrition and nets reaching an end of their serviceable life by 2017, which would reduce LLIN coverage. The CNM indicated existence of anecdotal reports of net attrition. To better assess net attrition and longevity, durability monitoring will be supported in one site in Cambodia. Durability monitoring with FY 2018 funds will follow standard PMI guidance to assess the attrition and physical durability of LLINs and LLIHNs that are distributed in the 2018 mass campaign in Eastern or Northeastern Cambodia. FY 2019 funding will be used for 36 month follow up. The chemical analysis of nets will be done at the Centers for Disease Control and Prevention (CDC).

### **c. Indoor residual spraying**

PMI does not support IRS in Cambodia.

## **2. Malaria in pregnancy**

Intermittent preventive treatment for pregnant women (IPTp) is not recommended in Cambodia. PMI will continue universal LLIN coverage, prompt diagnosis and treatment of clinical cases of malaria and SBCC for pregnant women.

## **3. Drug-based prevention**

### **a. Seasonal malaria chemoprevention**

Seasonal malaria chemoprevention (SMC) is not recommended in Cambodia.

## **4. Case management**

PMI continues to support training and supervision of 635 VMWs, staff from 92 public health facilities, and 245 private providers in PMI-targeted areas. There will be a geographic expansion of these activities to newly supported areas, which will add approximately 163 VMWs and 92 health facilities. This includes specific training on the management of severe malaria, radical cure treatment for *P. vivax*, glucose-6-phosphate dehydrogenase (G6PD) enzyme testing and malaria during pregnancy. PMI will expand support to improve the quality of diagnosis, treatment, and reporting of malaria cases in approximately 245 private sector outlets. PMI will not procure artemisinin-based combination therapy (ACTs), and will only procure a small quantity of gap-filling rapid diagnostic tests (RDTs) and microscopy kits, since almost all the requirements are met by commodities provided by the Global Fund RAI2e grant. In addition, to support implementation of radical cure of *P. vivax* infections, PMI will procure recently developed point-of-care G6PD devices and consumables. PMI will also support quality improvement of private sector case management through medical detailing, monitoring and supervision, and provision of malaria data to the national surveillance system in CNM supported areas.

## **5. Cross-cutting and other health systems strengthening**

### **a. Pharmaceutical management**

PMI will continue to provide technical assistance for malaria commodity forecasting, quantification, supply planning and consumption data collection and reporting. In addition, capacity building and coordination support on supply planning and management will be provided to CNM, provincial and OD level staff, and PMI implementing partners.

### **b. Social and behavior change communication (SBCC)**

With FY 2019 funding, PMI will continue supporting implementation of comprehensive and effective SBCC approaches for control and intensified elimination activities both at community and service provider levels. At the community level, SBCC messaging will target care-seeking behavior, adherence to treatment regimen, and use of appropriate prevention tools, particularly LLINs. For the service providers (public, community and private), SBCC approaches will target their behaviors in early detection and prompt treatment of individual cases, conducting case notification, investigations, and

timely responses to the cases. In addition, PMI will continue to provide technical support to CNM to facilitate evidence-based development and use of effective communication strategies, tools, and appropriate SBCC approaches to sustain community involvement, support promotion of healthy behaviors, and reduce risk-taking in the context of malaria elimination in targeted areas of Cambodia. With FY 2017 funding, an assessment to understand the behavioral determinants of key malaria-related behaviors of forest-going populations is currently underway and will be used to inform the design of future SBCC activities.

### c. Surveillance, monitoring, and evaluation

As Cambodia is successful in reducing the malaria burden, surveillance, monitoring and evaluation (SM&E) activities will change in intensity and cost. As transition-ODs become elimination-ODs, SM&E will become more intensive and costly with the switch from aggregate to timely individual case reporting, and with reactive case detection. In burden reduction provinces, passive case detection of malaria cases reported from health facilities and VMWs remain largely paper-based, aggregated, and entered into the Malaria Information System at OD level. In elimination-targeted ODs, the 1-3-7 approach is implemented, where cases are reported, investigated, and appropriate response activities are carried out. The implementation of the 1-3-7 strategy in PMI areas require intensive human resources and timely response to each indigenous case through the use of a Day-0 SMS Alert System for rapid notification, follow up of cases with 3-day directly observed therapy (DOT) by VMWs, and where appropriate, reactive case detection is conducted around index cases (e.g., screening of co-travelers) as well as SBCC and LLIN top-ups.

With FY 2019 funding, PMI will support SM&E activities in the expanded geographic area (current provinces, in addition to two to five new ODs) in the public and private health facilities, and at the community level. It is expected that only Phnom Kravanh and Krakor ODs in Pursat Province will still be reporting aggregate surveillance data; the two to five new ODs, the two ODs in Pursat Province, five ODs in Battambang Province and one OD in Pailin Province, should all be conducting case-based, elimination-focused surveillance.

**Table 5: Surveillance, Monitoring, and Evaluation Data Sources**

| Data Source                                     | Survey Activities                                    | Year |      |      |      |      |      |      |      |      |      |
|---|--|------|------|------|------|------|------|------|------|------|------|
|   |  | 2011 | 2012 | 2013 | 2014 | 2015 | 2016 | 2017 | 2018 | 2019 | 2020 |
| Household surveys                               | Demographic Health Survey (DHS)                      |      |      |      | X    |      |      |      |      | (X)  |      |
|   | Malaria Indicator Survey (MIS)                       |      |      | X    |      |      |      |      | (X*) |      |      |
| Malaria surveillance and routine system support | Support to malaria surveillance system               |      |      | X    | X    | X    | X    | X    | (X)  | (X)  | (X)  |
| Therapeutic                                     | <i>In vivo</i> efficacy testing                      | X    | X    | X    | X    | X    | X    | X    | (X)  | (X)  | (X)  |
| Entomology                                      | Entomological surveillance and resistance monitoring |      |      |      |      |      |      |      | (X)  | (X)  | (X)  |

\*The survey planned is not a full MIS, but rather a targeted malaria survey that is based off the MIS methodology. It is not PMI-funded.

#### **d. Operational research**

No operational research activities are planned with FY 2019 funding.

#### **e. Other health systems strengthening**

PMI will continue to support capacity building at national, provincial and OD levels in PMI-supported areas, for successful planning, implementation, management, and monitoring and evaluation of malaria elimination activities. Supervisory skills of CNM, provincial health department (PHD) and OD staff will be strengthened, and support for enhanced supervision for malaria control and elimination activities at health facilities, community level, and private providers will be continued. PMI will also support CNM to update their malaria control and elimination strategy and tools based on the evidence and lessons learned from the implementation of activities in different epidemiological settings.

In addition, PMI will initiate support in FY 2019 for one CNM staff person to participate as a fellow in the Field Epidemiology Training Program (FETP).

### **6. Staffing and administration**

PMI Cambodia supports staffing and administration that follow PMI policy, as articulated in the FY 2018 MOP.