

PMI ZAMBIA FY17 MOP SUPPLEMENTAL SECTION ON PRE-ELIMINATION

1. Background

Since publication of its \$25 million *FY17 Malaria Operational Plan* (MOP), PMI Zambia was fortunate to receive an additional \$5m in FY17 funding from the U.S. Congress earmarked for investments in pre-elimination districts.

This document is a supplemental section to the FY17 MOP. It describes PMI Zambia's plans to support a set of 'pre-elimination districts' with the \$5m in additional funds. Like the main MOP, it provides information on the relevant strategic framework and malaria situation; outlines the proposed interventions with justification and concludes with budget tables.

Zambia was selected for this new kind of support for several reasons, among them:

- 1) Progress in malaria control since 2006 throughout the country, and the well-documented further progress made toward elimination since 2014 in Southern Province (where prevalence was reduced from 13.6% in 2006 to 0.6% in 2015). That province's success has been attributed to the achievement, by 2012-2014, of sustained high coverage of a package of interventions, namely universal ITNs, targeted IRS, community case management, SBCC with good community engagement, and intensive surveillance, all based on sustained investments by the GRZ and partners including the Global Fund and PATH/MACEPA. The NMEC and its partners are interested in adapting and scaling up the Southern Province package to benefit other provinces and to provide an expanding buffer which would protect the gains in Southern.
- 2) The strong commitment of the country's political and public health leadership to malaria elimination, as embodied in the country's *National Malaria Elimination Strategic Plan 2017-2021* (NMESP) and in the rebranding of its NMCP as the National Malaria Elimination Center. This plan, launched by Zambia's President Edgar Lungu in April 2017, commits the Government and partners to an ambitious goal of national malaria elimination through high coverage of a full package of standard interventions, with the addition of new interventions as warranted.
- 3) PMI's experience of effective collaboration with the Zambian government (GRZ) in malaria control, particularly in the PMI focus provinces of Luapula, Muchinga, Northern and Eastern. Within this geographic area, a set of reduced-burden districts on the plateau of Eastern Province were identified as potential path-finders, who with enhanced investments might be able to achieve pre-elimination status in a relatively short period of time.

2. Strategic Framework

To make best use of the new funding opportunity, PMI Zambia consulted closely with the National Malaria Elimination Center (NMEC) and its cooperating partners to develop a strategic

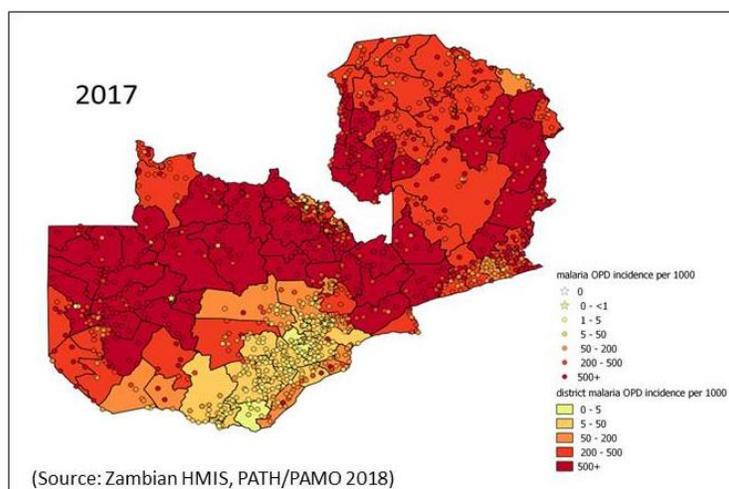
document entitled *PMI Zambia Investments in Pre-Elimination: Proposed Strategic Approach for the First Three Years*. The PMI strategy development began with the NMESP and with the internationally accepted approaches which were encapsulated in the *WHO Global Technical Strategy for Malaria 2016-2023*, the *RBM Action and Investment to Defeat Malaria 2016-2030*, and especially in the WHO's 2017 *Framework for Malaria Elimination*. These landmark documents laid out a vision of a continuum of efforts, in which planners would recalibrate their investments and strategies as local malaria burdens fell, applying tools and systems appropriate to the local case incidence levels while preparing for the next phase.

Consistent with WHO guidance, the Zambian NMESP promotes the following principles:

- The unit of elimination and of intervention implementation will be the Health Facility Catchment Area (HFCA).
- Malaria incidence thresholds will guide the intervention package toward the goal of malaria elimination.
- Epidemiologic and entomological information (clarified using data reviews and verification procedures) will be critical in directing action and tracking progress.

The NMESP stresses the importance of stratification of geographies by degree of malaria burden, so that interventions are targeted to the specific needs of each area, to ensure the appropriate steps are taken in each area. The plan stratifies the country into 5 different categories (Levels 0 to 4, as indicated in the table above), based on case incidence as measured at the Health Facility Catchment Area level, not province level. (Figure 2). At each level the program has identified various activities that should be conducted based on the malaria incidence. This stratified approach is technically reasonable – although the early use of MDA is somewhat controversial – is conceptually straightforward, and it has been readily embraced by the malaria partners in Zambia, including PMI.

Figure 1A and 1B. Stratified approach to applying malaria control interventions, from Zambia's National Malaria Elimination Strategic Plan



	INTERVENTION PACKAGE/ACTIVITIES	ACCELERATOR
○ LEVEL 0 0 cases* No local transmission	No malaria, maintenance of malaria-free zone <ul style="list-style-type: none"> • High-quality surveillance and vigilance • Vector control and case management • Case investigation capacity maintained • Chemoprophylaxis 	<ul style="list-style-type: none"> • Not applicable
● LEVEL 1 1–49 cases* Typical range <1% parasitic prevalence	Very low malaria transmission <ul style="list-style-type: none"> • High-quality surveillance • Vector control (possibly enhanced) • Community and facility-based case management • Case and foci investigation 	<ul style="list-style-type: none"> • Mass drug administration
● LEVEL 2 50–199 cases* 0.5%–<5% parasitic prevalence	Low malaria transmission <ul style="list-style-type: none"> • Build high-quality surveillance • Vector control (possibly enhanced) • Community and facility-based case management • Establish case and foci investigation capacity 	<ul style="list-style-type: none"> • Mass drug administration
● LEVEL 3 200–499 cases* 5%–<15% parasitic prevalence	Moderate malaria transmission <ul style="list-style-type: none"> • Improve quality surveillance • Vector control (possibly enhanced) • Facility-based case management; build community case management and outreach • Establish case and foci investigation capacity 	<ul style="list-style-type: none"> • Mass drug administration (may be considered for specific areas with case investigation capacity) • Enhanced vector control if relevant
● LEVEL 4 >500 cases* >15% parasitic prevalence	High malaria transmission <ul style="list-style-type: none"> • Build quality surveillance • Vector control to high coverage (100% coverage of IRS or sustained high coverage of LLINs) • Facility-based case management; begin to build community case management and outreach • Prepare for case and foci investigation capacity 	<ul style="list-style-type: none"> • Prepare for mass drug administration • Enhanced vector control if relevant

*HMIS malaria incidence per 1000 population per year (2015)

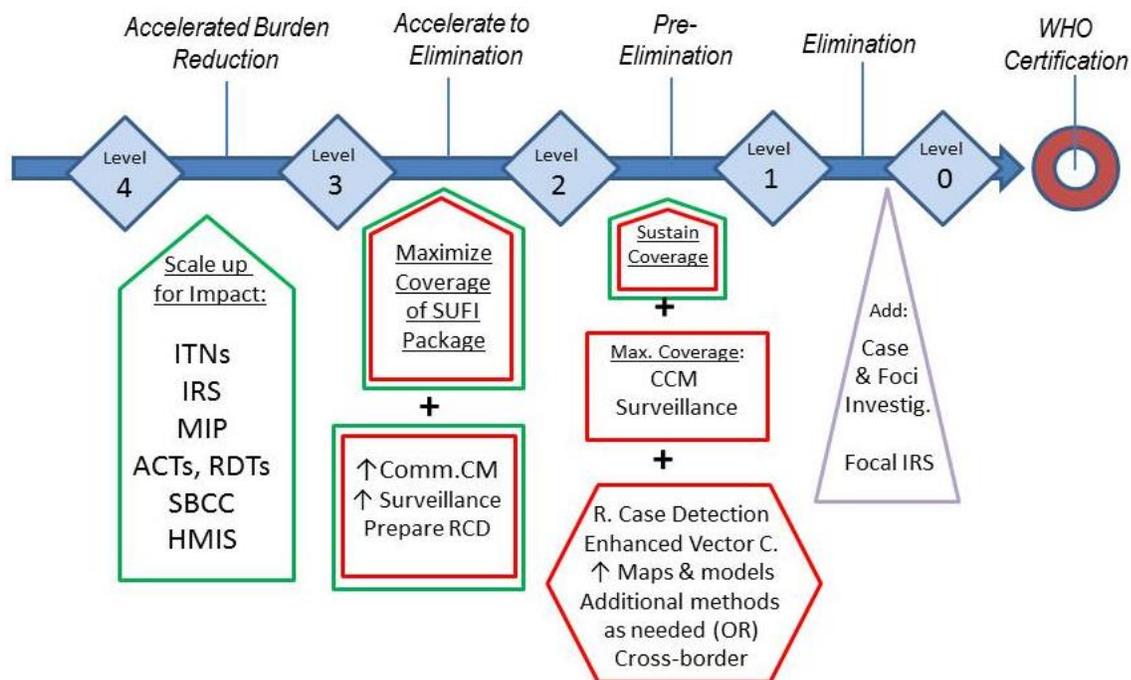
In response to these international and Zambian strategies, and consistent with the *PMI Technical Guidance*, PMI Zambia has developed an integrated strategy for the new investments in malaria elimination, presented in the schema and table (Figure 2 and Annex 1). As a major partner of the NMEP, PMI aims to help the country accelerate toward its goal of malaria elimination as aggressively as resources, epidemiologic realities and local constraints allow.

For programmatic, budgetary and ethical purposes, it is useful to envision the majority of PMI investments, which are captured in the “main” MOPs, as forming a complementary but distinct stream from the new elimination investments. This approach facilitates the vigorous pursuit of elimination and learning about elimination as a valuable albeit lesser objectives in their own right, while not distorting and distracting from the main thrust of PMI Zambia’s program.

Key objectives for the PMI Zambia investments in the pre-elimination districts include:

- Developing the building blocks for elimination. This includes refining core package of interventions needed to achieve and sustain impact and preparing the ground for accelerating activities.
- Documenting and share lessons learned and achievements

Figure 2: PMI Response to the NMESP: A Schema for PMI Zambia Investments in Elimination



Key:

- Main MOP investments in **Green** in 40 districts in 4 provinces.
- Additional PMI Elimination investments in **Red** in 5 districts in Eastern Province.
- Potential future investments in **Purple** as local incidence approaches zero.

3. Malaria Situation in the Target Districts

The rationale for selecting Eastern Province is mainly on several considerations, including:

- Potential to build on the PMI package of assistance, which since 2014 has included major support for ITNs, IRS, MIP, improved case management at health facility and community level, SBCC, and improved data collection and analysis for decision making. PMI resources have complemented investments by GRZ, Global Fund, CHAZ and the Against Malaria Foundation.
- Good progress in reducing U5 malaria prevalence, from 25.4% in the 2012 to 12.7% in the 2015 MIS,
- Consistently high coverage of vector control, including 56% household IRS coverage and 78.2% U5 ITN use in the 2015 MIS, compared with national averages of 56% for IRS and 58.9% for ITNs.
- Pre-existing foundation for surveillance, for example, in Katete district which has already initiated case follow-up activities,
- Potential to contribute to a contiguous corridor of reduced transmission along the southern/southeastern border of Zambia, from parts of Western through Southern and Lusaka to parts of Eastern provinces,

Within Eastern Province, the low-lying, warmer area along the river valleys on the north and east are unsuitable for pre-elimination activities. But in marked contrast, the higher, cooler districts on the plateau (approx. 1050m and mean annual temp 22-23°C), lying along the well-paved national highway have much reduced inherent malaria transmission potential and are more amenable to population-based interventions. According to a 2006 baseline prevalence model, these areas had malaria prevalence of less than 10% (Riedel et al., *Malaria Journal* 2010 9:37). The three lowest 2017 case incidences in Eastern Province (as estimated by PATH/PAMO) were Katete (100, NMESP level 2) and its neighbors Sinda (210, lower level 3) and Chadiza (320, level 3).

Figure 3. District map of Eastern Province, Zambia, showing proposed focus districts (Source: Ministry of Lands, 2014)

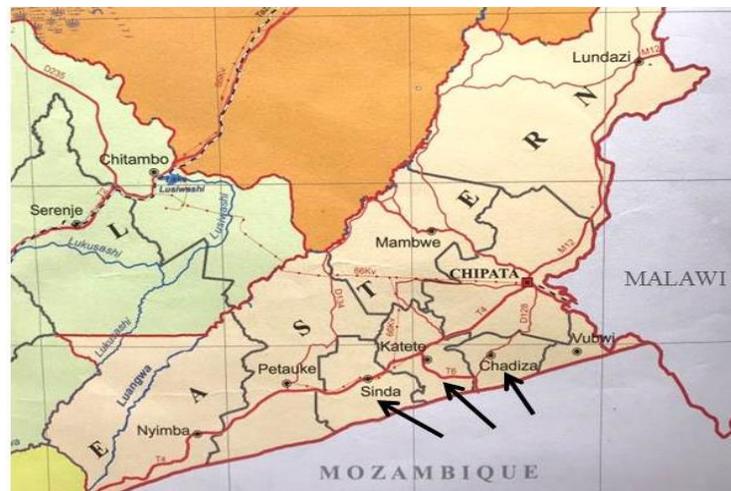
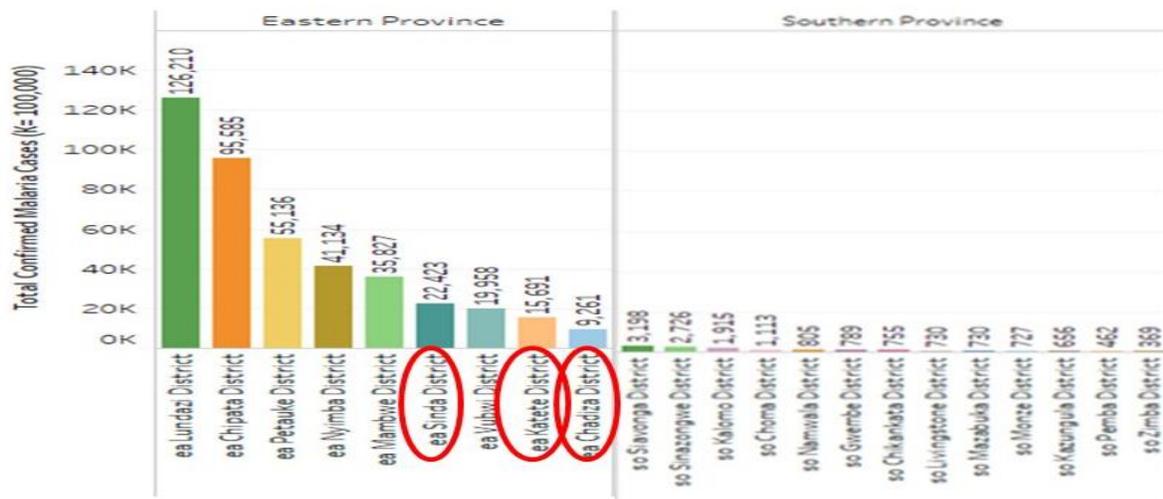


Figure 4. Peak season totals of confirmed malaria cases in Eastern Province and Southern Province, by district November 2016-May 2017. (Source: HMIS data, NMEP/MACEPA analysis.)



The case volumes for the peak season months of November through May 2016-17 were also the lowest in the province. Katete had 15,691 total peak season cases (average of 2240 per month), Sinda 22,423 cases (avg. 3200/mos.), and Chadiza 9,261 cases (avg. 1323/mos.) Given the important consideration of operational feasibility of the proposed labor-intensive reactive case detection (RCD) activities, it is valuable to review the peak season caseloads, summarized at district level in Figure 4. The lower-burden HFCAs of Petauke and Chipata districts which neighbor Sinda, Katete and Chadiza have a similar profile to them, and would be appropriate to include in a contiguous geographic block of targeted areas (Figure 3).

In terms of entomologic indicators, the proposed target area is well characterized, because two PMI-supported entomologic sites in Katete have been collected monitoring data since 2015. Transmission is unimodal, corresponding with the single rainy season. The major vector is *Anopheles funestus*, which is present throughout the peak transmission season (December through May) while *A. gambiae* tends to be found only late in the season (April-May). Significant biting behavior is noted from January through May at sprayed sites, continuing to August at unsprayed sites.

Although pyrethroid resistance was detected at some sites in nearby provinces, there was no resistance found to pyrethroids, organophosphates including Actellic CS, clothianidin (SumiShield©) or DDT in Katete in 2017. Reduced susceptibility to pyrethroids and DDT was noted, however. While DDT may be expected to kill the main vector effectively, it would be considered an undesirable choice for future spraying in the area due to issues of procurement, disposal, operational costs, and environmental mitigation demands.

Concerningly, four months after application of Actellic CS in the October-November IRS campaigns, the killing action of residual pesticide tended to drop below acceptable threshold. The juxtaposition, late in the transmission season (March-May) of high rates of vector activity with inadequate IRS residual activity, suggests that single-application IRS alone may provide inadequate protection to the local population.

4. Plans and Justification

Phased approach

A phased approach will be employed, whereby the first thrust will be to achieve high levels of the standard package of malaria control investments in the target districts, followed by reassessment, and introduction of additional or modified approaches as warranted. Evidence for the first two years will inform investments for Year 3 and beyond. Strengthened local systems for data collection, management and analysis would be expected to permit close monitoring of intervention coverage and impact during Year 1 and 2.

Year 1 and 2 (FY17 and FY18 funds): Attain high coverage of main interventions

- Full package (ITNs, IRS, iCCM, Step D, SBCC) in Katete, Sinda, Chadiza
- Phase in CHW training and deployment over 2 years
- Build capacity for iCCM and Step D in selected HFCAs in the neighboring Petauke district and rural parts of Chipata district

- Use the mSpray mapping technology, and the results of recent PMI-funded OR on IRS targeting approaches, to maximize true coverage of IRS, and possibly other population-based interventions (ITNs, SBC, etc.)

Years 3 (FY19 funds) and beyond: Reassess, add new interventions as appropriate

- Consider further geographic expansion of full package to adjacent HFCAs in Petauke, Chipata, and possibly other areas of the plateau
- Consider adding new malaria control tools, such as attractive targeted sugar baits (ATSBs, currently undergoing testing in Southern Province), MDA, and/or other interventions, in an OR setting
- Continue IRS initiated with FY17 funds to ensure coverage for a minimum of 3 years to the newly targeted populations.

Baseline Assessment

The PMI elimination activities will commence with a rapid baseline assessment of the malaria situation, intervention coverage and availability, and district-level capacity in the selected pre-elimination districts. The assessment will review: a) malaria epidemiological data; b) LLIN and IRS coverage; c) access to community case management for malaria; d) effectiveness of existing case management practices e.g. case confirmation rates; e) routine reporting systems for malaria; and f) interventions/strategies to improve the quality of malaria services, stock management, and reporting, analysis, and use of data. The assessment will incorporate mapping and modelling of data to inform program design. Results will be reviewed with PMI, NMEC and contribute to jointly developed master facility/CHW lists, revision of in-service training, modification service delivery approaches, and performance monitoring. Among other data sources, the assessment will benefit from the oversampling within the MIS throughout Eastern Province which was funded by PMI in 2017.

Proposed activity with FY17 Funding:

- Baseline assessment of malaria situation (epidemiologic and entomologic), intervention coverage and availability, and district-level capacity in selected pre-elimination districts. Map and model data on transmission to inform program design. (\$200,000)

Entomologic Monitoring and Insecticide Resistance Management

Local entomologic monitoring data has been obtained in recent years in the context of a PMI-supported IRS program, as reviewed above. This valuable data on local vectors, biting rates, resting densities, pesticide susceptibility and pesticide residual activity, among other parameters, will inform the initial program design. Moreover, regularly updated data will be essential for guiding the program year by year.

With the expected continued reduction in local vector populations and transmission indices, Katete's sites are expected to become progressively less representative of Eastern Province, and in particular of the riverine habitats. To guide malaria control efforts in the rest of Eastern and to inform future expansion of the elimination focus area to neighboring districts, it will be prudent

to establish additional monitoring sites. Entomologic monitoring will also benefit from investments in increased timeliness of sample analysis as compared to the 2016-17 season.

Proposed activity with FY17 Funding:

- Establish at least two additional entomologic monitoring sites (sprayed and non-sprayed) in high-burden HFCAs of neighboring district(s) to complement the current sites in low-burden Katete District. Strengthen systems for analyzing samples and reporting on entomologic indicators so as to reduce lag-times and better inform local and provincial IRS and ITN programming. Invest in NMEC capacity, including entomologist training. (\$115,000)
- Provide CDC technical assistance on entomologic monitoring, insecticide resistance management, and other aspects of optimizing vector control in a challenging pre-elimination setting. This supplemental funding will permit non-diversion of technical assistance resources from high burden areas supported by PMI. (\$19,500)

Universal Coverage of Insecticide-Treated Bed Nets (ITNs)

As previously mentioned, vector control in this area cannot rely solely on IRS. IRS effect wanes after 4-5 months, as show in the increased rates of indoor fed mosquitoes the spikes in vector populations at around that time, which is associated with the documented waning in efficacy of the pesticide residues. Given that optimal vector control is needed to accelerate to elimination, this is argument for universal ITN coverage, rather than for IRS in certain easy-to-reach areas and ITN in the other areas, as the NMESP promotes. Universal ITN coverage has not yet been achieved, as the recent mass campaign provided nets adequate to meet only 82% of the documented need. The campaigns rationed at household level, not by catchment area, so the gap is diffuse. A jump-start ITN activity will be to prepare and implement a mop-up campaign to close the coverage gap prior to the 2018-19 rainy season.

In the meantime, the districts will be aided to strengthen routine distribution channels. Consistent with national strategy, this will include distributions through ANC and EPI clinics. In addition, support will be given to scale up school based distribution, consistent with the national strategy of distribution ITNs in grade 1 and 4 during years without mass campaigns.

Proposed activity with FY17 Funding:

- Procure ~55,000 ITNs to meet universal coverage targets of the 2017-18 ITN campaign, filling the 18% gap at household level. (\$156,000)
- Procurement of ~30,000 LLINs for school-based distribution (1st and 4th grade population x 1 year). (\$85,500)
- Provide logistical and technical assistance for "mop-up" distributions of ITNs for the local January 2018 campaign, filling the 18% gap at household level. To include high

quality enumeration, planning, distribution and monitoring. (\$135,000)

- Establish school-based distribution and monitoring system in the target districts. (\$305,000)

Continued and Optimized Application of Indoor Residual Spraying

As demonstrated in Southern Province, IRS is a central component in the package of interventions which can bring an area to pre-elimination status. Where high IRS effectiveness can be assured (high proportion of local population targeted and protected), IRS makes meaningful additional contribution in setting of high ITN coverage. In light of documented resistance to pyrethroids in northeastern Zambia, there is justification for non-pyrethroid to slow the development of pyrethroid resistance in the target are, thus protecting ITNs.

In the 2018 IRS season, per the NMEC plan, PMI will use its IRS budget to support IRS campaigns in Luapula, Muchinga and Northern Provinces at higher coverage levels than in previous years. To compensate, PMI will no longer support spraying in Eastern Province. The proposed exception will be the 3 targeted pre-elimination districts, using a portion of the new elimination funding. The NMEP is supportive of this approach, with the caveat that IRS programs in Eastern Province in 2018, following 5 or more years of Actellic CS, should no longer use an organophosphate, as per their policy on insecticide resistance management. The NMEP supports use of SumiShield or DDT for use in all districts of Eastern Province in 2018 campaign. The GRZ plans to fund IRS in any districts not covered by PMI, although operational feasibility and funding were uncertain at the time of this documents was in preparation.

All 3 districts were included in the 2014-2017 PMI-funded IRS campaign. In 2017 they were spraying in November and December, i.e. at the start of the rains. IRS coverage of the targeted areas in the district, measure as structures sprayed out of structures found, was 90% or above. However IRS effectiveness, measured as population protected out of full district population, was 50-60%. The approach of prioritizing geographically concentrated structures was employed, such that the more remote and difficult-to-access parts of the districts were typically not sprayed. In recent years Katete district, in particular the urban “BOMA” was observed to have high rates of IRS refusal, requiring additional SBC efforts and extra investments in “mop-up” spray operations. Katete was included in a PMI-supported OR study regarding targeting approaches, and therefore benefited from detailed satellite mapping using the mSpray technology.

Due largely to cost considerations, the PMI and Global Fund supported IRS programs in most parts of Zambia are not slated to incorporate the mSpray technology into their operations. However, the technology has proven to be impactful and the level of granular mapping and tracking that it provides will be particularly beneficial in the pre-elimination districts in Zambia, while efforts are made to improve operational challenges and cost-effectiveness.

Proposed activity with FY17 Funding:

- Procurement of IRS commodities and support to other components of the program. To assure timely and high-quality IRS application in 2018, procure insecticides and other IRS supplies/equipment for spraying up to 90,000 structures in 3 pre-elimination districts. Insecticide selection will be evidence-based, will be informed by consultation with the NMEC, Vector Control TWG and the ZEMA, and may include either Actellic CS or Sumishield. (\$445,000)
- Implement high-quality IRS program, including monitoring and evaluation, storage/incinerator, community sensitization, and geocoding. To assure timely and high quality IRS application in 2018, support the implementation of an IRS program in 3 pre-elimination districts. This will include activities to: train spray operators, supervisors, and store keepers; monitoring and evaluation; pesticide storage; waste disposal; and pay for spray operations. Includes SBCC for IRS. (\$410,000)
- Optimized mapping and deployment of IRS to local populations, applying lessons learned from the recent operations research study in Eastern Province, as well as the IRS national impact evaluation, to achieve maximum, cost-effective impact. Funds will supplement the usual IRS budget, permitting further development and full deployment locally of mSpray technology, including in enumeration for SBCC for IRS and real-time guidance of spray operations, and to enhance post-spray monitoring. Explore use of the mapping for multiple purposes, potentially SBCC, ITNs, CHW, geospatial analysis, and quality assurance. (\$225,000)

Malaria in Pregnancy

While pregnant women are not considered to be major drivers of malaria transmission, they are an especially vulnerable population in terms of malaria morbidity and mortality. In the pre-elimination setting, it will continue to be important to optimize prevention of uncomplicated and severe malaria in pregnancy.

Proposed activity with FY17 Funding:

- Reduce morbidity and mortality from malaria in pregnancy by strengthening community-based passive and active case detection and management, and improved reporting of cases at community and health facility level. These activities are captured under case management. (\$0)

Enhanced Case Management, especially at Community Level

Case management will be strengthened at facility and community level through increased training and supportive supervision. CHW and CHA training on iCCM will be expanded to

include the diagnosis and treatment of malaria in all ages and reporting of data through a community surveillance system adapted from the Step D platform.

The expansion of community-level case management of malaria is well-recognized to reduce morbidity and mortality and to contribute to reduced case incidence. Zambia's national strategy has long emphasized the scale-up of community case management using ACTs and RDTs. In the past year, as part of the roll-out of the NMESP 2017–2021, the NMEC has redesigned the iCCM package to include community-level malaria surveillance. The NMESP calls for expanding community case management, including reactive case detection when appropriate, to bring to scale the coverage of effective curative and preventive interventions, and to strengthen information systems such that each malaria case is reported and followed. (Test-treat-track approach.)

In high burden, resource-limited areas, most malaria diagnosis and treatment will occur through passive case detection, where symptomatic patients present to a health facility or to a community health worker (CHWs). The deployment of increased numbers of CHWs who can provide prompt convenient, free care community serves is recommended for all areas of Zambia. As malaria burden falls and the ratios of health workers to population increases, community case management can be expanded by incorporating “reactive” case detection (screening household members and neighbors of index cases found in passive case detection, aka “Step D” activities in Zambia).

Effective passive and active case detection rely on high coverage of CHWs. The MOH recommends in the Community Health Worker Strategy to have 1 CHW per 500 population. However, MACEPA has demonstrated the effectiveness of 1 CHW to 850 population in lower transmission areas of Southern Province and the ratio of approximately 1 CHW per 750 population in higher transmission areas within Southern and Western provinces. For planning purposes, this document uses the 1:750 ratio. From MACEPA experience, when rolling out a pre-elimination program, virtually all existing CHWs will need to be given malaria-specific training or retraining.

PMI will support the training and deployment of CHWs to implement iCCM and surveillance. In order to spread costs and promote effective incorporation of the many new CHWs, PMI will support phasing in over two years. In the first year, training and deployment of CHWs will cover at least half of the estimated total need (727 CHWs). Of note the 78 CHWs recently trained in Katete and Sinda in iCCM (by the PAMO project) would need Step D training only.

Financial and technical assistance from PMI will provide the following package of enhanced support to these CHWs:

- (1) provision of an “enabler’s kit” (bicycle, t-shirt, supply box etc), as recommended by MOH and MACEPA
- (2) establishment of a rigorous CMIS program that captures at least monthly capture of caseloads and commodity flows and will progress to incorporate malaria rapid reporting (MRR) as appropriate,
- (3) close supervision and mentoring of CHWs by health facility and district personnel,
- (4) enhanced demand creation for CHW services through SBC, aided by the CBOs/CSOs.

Across all districts, in order to ensure that the CHWs have the commodities to work with, PMI will support the procurement of RDTs and ACTs to avoid stock outs, especially in the early scale up, where experience in Southern Province showed this is common. In addition, technical assistance will be provided to the Medical Stores, the DHOs and health facilities to assure a robust supply chain.

Proposed activity with FY17 Funding:

- Procurement of RDTs. Procure 65,000 RDTs for health facilities and iCCM to cover the expected initial, transient 25% case increase as services expand. (\$118,150)
- Procurement of ACTs. Procure 17,000 courses of ACTs for health facilities and iCCM/Step D to cover the expected initial, transient 25% annual increase in case capture as services expand, to ensure avoidance of stock-outs. (\$106,350)
- Strengthen malaria diagnostic capabilities at the health center level in targeted pre-elimination areas. Support training and supportive supervision to provide high OTSS coverage of health facilities in the focus districts. At least 50% of HFs should be covered in year one, and plans made to potentially cover the remainder in year 2. (\$275,000)
- Procurement of microscopes, reagents and supplies. To strengthen health facility diagnostic capacity and maintain skills procure limited number microscopes, reagents and supplies, based on the rapid assessment. (\$10,000)
- Strengthen community-based diagnosis, treatment and surveillance. Establish community level diagnosis, treatment services in 3 targeted districts, combining iCCM and Step D approaches, to include malaria case management for all ages. In Year 1, train and deploy at least half (325) of required CHWs in iCCM (i.e. at least half of the 727 needed minus the 78 trained in iCCM in late 2017), and strengthen supervisory capacity at HF and district levels. Will include supportive capacity building for supervision of case management. Plan for potential training and deployment of remaining CHWs in Year 2. (\$780,000)
- Strengthen pharmaceutical and supply chain management systems to support scale up of iCCM. Provide technical assistance to strengthen pharmaceutical and supply chain management systems to support rapid expansion of malaria case detection and management at community level. The focus will be on establishing reliable systems for distributing ACTs, RDTs and other iCCM supplies to community workers and for collecting and responding to consumption reports. ((\$150,000)

Health System Strengthening/ Capacity Building

The PMI elimination investments include a range of activities which contribute to health system strengthening and capacity building. Most are described in the foregoing sections. Here, one funded HSS activities is described, related to MOH staff capacity building, and one unfunded activity, related to cross-border initiatives.

Proposed activity with FY17 Funding:

- Strengthen MOH Capacity in Pre-elimination. Provide support to strengthen MOH staff capacity in malaria pre-elimination areas through professional development activities. Activities will include training workshops (e.g., SMEO, FETP Frontline Program, commodity quantification) and regional/global meetings (e.g., American Society for Tropical Medicine and Hygiene) (\$60,000)
- Cross-border activities. In FY17, PMI will not fund specific cross border activities through implementing partners. However, the strengthening of malaria case reporting as described in other sections will aid in disaggregating cases by country of origin. In addition, PMI staff at the national level will liaise with SADC E8 staff to increase coordination regarding international cross-border programs for malaria elimination, such as information sharing. They will begin to prepare for more intensive future efforts as case incidences reduce, and the importation of cases from Malawi and Mozambique begin to make a significant contribution to local transmission. (\$0)

Social and Behavior Change Communication (SBCC or SBC)

Effective SBCC is if anything, even more important in pre-elimination settings than in SUFI settings, given the need to optimize intervention coverage and add new tools. A PMI-supported 2017 study entitle “Social behavior change considerations for areas transitioning from high and moderate to low, very low and zero malaria transmission” highlighted the following roles of SBCC in this setting:

- Establish appropriate levels of perceived severity as malaria cases decline and perceived risk decline
- Introduce new case management interventions and establish trust and understanding among both communities and service providers
- Ensure service providers and equipped with counseling skills to address concerns about fevers that increasingly test negative for malaria to avoid patient dissatisfaction and erosion of trust between patients and providers
- Maintain prompt care-seeking
- Maintain high levels of ITN use
- Test new sampling methods and behavior change approaches where/when appropriate

Community-level SBCC will be strengthened through additional support to CBOs and FBOs to promote uptake of malaria interventions and to provide targeted messaging appropriate that takes into account the local context and changing malaria epidemiology.

Proposed activity with FY17 Funding:

- Support SBCC at district, health facility, and community levels to promote malaria elimination interventions. Provide additional support for district-, HF-, and community-based SBCC for proper and consistent net usage, increased ANC attendance and demand for IPTp, and increased early care seeking behavior and demand for proper malaria diagnosis and adherence to treatment for malaria at HF and community levels. The SBCC will use multiple channels such as local radio, print materials, and community-based SBCC through NGOs/FBOs. (\$500,000)

Enhanced Surveillance, Monitoring & Evaluation

In the context of malaria elimination, as malaria cases become rare, data quality becomes increasingly important for making the right decisions that will help accelerate the reduction of malaria cases. Confirming every suspected case becomes top priority. Timely acquisition of data to efficiently deploy supplies, plan the right type of interventions, and focus attention on specific locations becomes critical. In general, frequency of data reporting should increase from monthly to weekly, and geolocation of cases should be incorporated over time. In Southern and parts of Western Province where Step D has been implemented, the NMEC has adopted a DHIS2-based Malaria Rapid Reporting (MRR) system to meet these data needs and feed into timely decision-making. The MRR currently captures weekly reports from health facilities, monthly reports from the CHWs, with a dashboard for visualization that supervisors, district offices, and the NMEC can readily view. The intention is to implement MRR in other areas where Step D is being scaled up. The community component of the MRR system will eventually be adapted into the Ministry of Health's community HMIS (CHMIS) system which is currently under development.

The active component of community malaria surveillance (aka reactive case detection, aka Step D) will involve creating the expectation that passive RDT-positive cases (index cases) seen at health facilities or in the community are followed up by the CHW. The aim here is to test the household of the passive positive individual, test the surrounding households, and treat anyone found to be positive.

In Zambia it has been determined that individual CHWs are able to follow up 5–10 passive positives in a month. For malaria surveillance to function effectively, data quality support must be provided and invested in. PMI will support malaria data reviews focused on community surveillance data, so that supervisors at HF, district and higher levels are able to track, analyze, and use malaria surveillance data. The DQA tool already promoted by PMI has been used extensively by NMEP in Southern Province and had proved to be very effective in supporting malaria data quality improvement. The tool focuses on six pre-selected data elements, including: (1) total clinical malaria cases, (2) total clinical malaria cases in pregnancy, (3) total confirmed malaria cases, (4) total confirmed malaria cases in pregnancy, (5) total OPD attendance, and (6) total cases tested (microscope/RDT).

Proposed activity with FY17 Funding:

- Strengthen reporting tools for community case reporting and surveillance. Provide technical assistance for implementation of robust reporting tools for community case reporting and surveillance (i.e. MRR, and presumably CHMIS when it is ready) which link to national-level systems (HMIS, DHIS2) (\$200,000)

- Enhance surveillance and reporting in targeted pre-elimination districts. Establish community surveillance and strengthen community and facility reporting through HMIS/DHIS2. Methods will include the adaptation and rollout of Step D community reporting tool; supportive supervision for both case management and surveillance activities; and supporting data review meetings and DQAs. Build capacity for case and foci investigations in future.) (\$510,000)
- Strengthen district data review and planning. Provide resources for national and provincial level malaria personnel to conduct district-level data review and site visits to inform collaborative decision making in programming resources for malaria elimination. Support exchange of information and experience with DHOs from other pre-elimination areas of Zambia. (\$175,000)
- Provide CDC technical assistance on implementation of malaria surveillance in pre-elimination settings, including implementation of community based passive and reactive case detection protocols; integrated of community data into HMIS; mapping and modelling. (\$19,500)

Staffing and Administration

Currently PMI Zambia has no plans to increase its internal staffing due to the \$5 million (23%) plus-up in funding related to elimination investments.

