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Greater Mekong Subregion Elimination of Malaria through Surveillance

PSI’s GEMS program strengthens private sector case management and surveillance to accelerate malaria elimination in Cambodia, Lao PDR, Myanmar, and Vietnam. This annual report shares the 2017 calendar year’s results, and looks ahead to responding to lessons learned in a dynamic context.
INTRODUCTION

With between 30-70% of people seeking treatment from the private sector in the Greater Mekong Subregion (GMS), engaging private health care providers is critical to the success of malaria elimination strategies. PSI’s Greater Mekong Subregion Elimination of Malaria through Surveillance (GEMS) program is: (1) increasing universal access to quality malaria diagnosis and treatment services by engaging private providers, (2) bringing care closer to the most at-risk populations, and (3) ensuring that national malaria control programs (NMCPs) have timely access to private sector data to drive decisions. This report shares the results from GEMS’ second year, during which the program scaled up its networks in Cambodia, Lao PDR, Myanmar and Vietnam, and rolled out new surveillance and quality assurance tools.

At the end of 2017, PSI supported a total of 21,028 private outlets and 333 worksites in the GMS, with the financial support of the Bill & Melinda Gates Foundation, Global Fund, DFID, 3MDG and Comic Relief. These outlets include private registered clinics and pharmacies in all countries. In addition, in Myanmar, where the government recognizes the important role that the non-formal sector plays, mobile drug vendors, drug shops and grocery stores stocking antimalarials are also supported. Together, this regional network conducted a total of 1,266,041 tests across four countries, and treated 43,513 positive cases, which were reported into national surveillance systems. This reporting represents a contribution to national surveillance systems that varies by country, by between 6-64% of the total cases tested, and 5-40% of positive cases reported.
To ensure that the treatment provided through the private sector is in accordance with national standards, PSI provides initial and annual refresher training on national treatment guidelines and government reporting requirements. In addition, providers receive job aids, and monthly to quarterly supportive supervision visits to answer questions and provide guidance, as well as check on or replenish stock, and collect and verify data. PSI staff also conduct periodic quality assessments of providers, using a tablet-based app – the Health Network Quality Improvement System (HNQIS) – that contains checklists based on WHO and national guidelines for correct malaria diagnosis and treatment. This allows PSI to assess quality, provide immediate feedback and guidance, monitor changes over time, and also plan how often providers require supervisory visits. Among providers assessed using HNQIS as it rolled out, 70% scored in Class A (80% or above), 27% Class B (50-79%) and 3% Class C (49% or below) – with most of the low scorers being newer providers who will improve with experience and support.

PSI uses the Malaria Case Surveillance app for providers to report cases in real time. Data from this app and HNQIS enter PSI’s DHIS2 system for analysis and reporting. Routine data, in addition to research and reflection on lessons learned, contribute to an evidence base that can be shared with other malaria stakeholders in order to contribute to the acceleration of malaria elimination in the GMS. To learn more about GEMS – including its use of mobile tools – please visit www.psi.org/GEMS.
Regional Insights

While malaria epidemiology remains varied across the region, the private sector played an important role in detecting and treating cases in all countries. With program support, private providers demonstrated the ability to manage cases in accordance with national treatment guidelines, and to contribute timely and accurate data to national surveillance systems. Successes in some contexts also serve as lessons learned for others. For example, in some countries, governments require private providers to refer *Plasmodium vivax* (*Pv*) cases to the public sector either to receive a G6PD test, or for fear of poor treatment. In many cases, however, referral hospitals are difficult to access for at-risk groups, meaning many cases remain untreated. Yet in countries where the private sector is permitted to fully treat *Pv*, this is being done successfully, increasing access for at-risk populations. Overall, results from 2017 demonstrate that private sector outlets remain critical partners to engage to ensure the success of regional malaria elimination strategies.

### 2017 TESTING

<table>
<thead>
<tr>
<th>Country</th>
<th>Testing</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cambodia</td>
<td>171,719</td>
</tr>
<tr>
<td>Lao PDR</td>
<td>14,424</td>
</tr>
<tr>
<td>Myanmar</td>
<td>1,076,127</td>
</tr>
<tr>
<td>Vietnam</td>
<td>3,771</td>
</tr>
</tbody>
</table>

### 2017 POSITIVES

<table>
<thead>
<tr>
<th>Country</th>
<th>Positives</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cambodia</td>
<td>30,145</td>
</tr>
<tr>
<td>Lao PDR</td>
<td>603</td>
</tr>
<tr>
<td>Myanmar</td>
<td>12,580</td>
</tr>
<tr>
<td>Vietnam</td>
<td>185</td>
</tr>
</tbody>
</table>
Cambodia

171,719
FEVERS TESTED

30,145
POSITIVES FOUND

64% of total fevers tested in country (public, private, VMW)

40% of national reported caseload detected through PSI's networks
PSI has supported Cambodia's Public Private Mix (PPM) and worksite programs since 2013. PSI-supported networks contributed 40% of the national reported caseload in 2017. Testing rates increased by 43% over 2016 as a result of testing campaigns on worksites, and in response to an outbreak in the northeast beginning in August 2017. The majority of cases detected have been among forest workers, followed by plantation workers, indicating that forest exposure remains a key risk factor as caseloads drop. Nearly 40% of positive cases are $Pv$; however, radical cure is only available through district hospitals for treatment, which can be inaccessible for many people. Lack of access to $Pv$ treatment remains a barrier for high risk populations and therefore a significant threat to malaria elimination.
Analysis of testing and positivity rates between private outlets and worksites generated valuable insights. Despite the worksite model being designed to reach populations at highest risk, worksite volunteers carry out less tests, and detect fewer cases than expected, particularly when compared to private providers in similar geographies. Human-centered design research revealed some barriers that workers face in accessing on-site testing, which resulted in adjustments to the worksite model. Ongoing data-driven adjustments are continually made as it is recognized that a dynamic approach is needed to detect cases on and around worksites. For example, new active case detection strategies such as testing household members and co-travelers of index cases on high-burden worksites yielded higher positivity rates than mass screening events. Further research into health provider preference among these at-risk groups is also planned to enhance the continued evolution of worksite programming.

Quality of care improved steadily throughout 2017. Private outlets consistently out-perform worksite volunteers, potentially because worksite volunteers typically have higher turnover, lower levels of education and little to no medical background compared to private providers. With few cases seen on most worksites, many volunteers have less opportunity to practice their skills. Additional support is being provided to worksite volunteers to address this gap.
Lao PDR

14,424 FEVERS TESTED
603 POSITIVES FOUND

5% of total cases tested in country (public, private, VMW)
6.5% of national reported caseload detected through PSI’s networks
In March 2017, PSI Laos began a gradual re-activation and scale up of the Public Private Mix (PPM) network in the five southern provinces that account for 95% of the national caseload. Private sector data was integrated into the national surveillance system and a Malaria Case Surveillance App was rolled out among 252 private providers to report data to DHIS2 in real-time.

Mass test-and-treat events were carried out on 15 worksites during peak transmission season to assess the epidemiological risk of worksite populations. 1,895 people were tested, and only two positive cases were found near the Nong District outbreak. Private sector reporting rates increased throughout the year, with 99% of PPMs submitting monthly reports in December. Real-time data was generated by 252 providers reporting cases through the Malaria Case Surveillance app installed on their devices.
personal smart phones. As a result of data integration efforts, private sector data was used by the NMCP to investigate an outbreak in October in Nong district. PSI Laos engaged in an NMCP-coordinated response by launching community based communication campaigns and bringing malaria testing and treatment services directly to villagers in a designated, high-risk catchment area.

47% of positives cases detected by PSI-supported outlets were *P. falciparum*. G6PD testing is required for providing radical treatment in Lao PDR, yet testing is only available in district and provincial hospitals. As in Cambodia, it is likely that many patients are not seeking or receiving the complete treatment they require given the distances to district hospitals. In 2018, GEMS will follow-up with referred *P. falciparum* patients to estimate the proportion that seek further care.

Baseline quality-of-care assessments conducted in November found surprisingly high results for a relatively new network. Upon investigation it was found that some results were over-reported due to a reluctance of staff to give providers low scores. Re-training PSI staff and repeat assessments are revealing specific performance issues that can now be addressed.
Myanmar

1,076,127 FEVERS TESTED
12,580 POSITIVES FOUND

34% of total cases tested in country (public, private, VMW)
11% of national reported caseload detected through PSI’s networks
PSI Myanmar has the largest and most diverse private sector networks in the region, including non-formal providers delivering malaria services in the most hard-to-reach places. Testing by Rapid Diagnostic Test (RDT) increased by 163% as a result of activities designed to improve provider adherence to national testing guidelines. Yet, the number of positive cases detected remained stable from 2016 – an encouraging indicator of the nation’s progress toward halting transmission.

The overall positivity rate across PSI’s networks declined from 2% in 2016 to 1% in 2017, which may indicate a declining national caseload. Community health service providers and non-formal providers located in rural and peri-urban areas throughout the country are responsible for the vast majority of testing and case detection. The program’s investment in

<table>
<thead>
<tr>
<th>PSI’s National Provider Network</th>
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<tbody>
<tr>
<td>Community Health Workers: 2,430</td>
</tr>
<tr>
<td>Non-Formal Providers (AMTR): 16,100</td>
</tr>
<tr>
<td>Physician Clinics: 705</td>
</tr>
<tr>
<td>Worksites: 168</td>
</tr>
</tbody>
</table>

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In addition to on-site services, an epidemiological study was conducted during the rainy season among nearly 2,000 workers on worksites, which found zero positive cases by RDT, and 27 by PCR (26 *P. vivax* and 1 *P. falciparum*). This channel continues to be monitored, and some new approaches are being piloted in 2018 to boost case detection, based on lessons learned from Cambodia.

The first-ever quality of care assessment was delivered across the non-formal provider network. Nearly 4,000 providers were assessed, most achieving a satisfactory score. More evidence is needed, but baseline quality assessment results indicate that with proper support, the non-formal sector is capable of delivering quality malaria care. As with formal providers in other countries, the areas for further support and attention include client history taking and physical examination.

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Vietnam

3,771 fevers tested
188 positives found
4.5% of national reported caseload detected through PSI networks
GEMS is the first program to engage the private sector in routine passive malaria surveillance in low-burden Vietnam. The network scaled up to 164 highly targeted clinics in the four highest-burden provinces. Despite the relatively small footprint of this channel, PSI clinics detected 4% of Vietnam’s national caseload in 2017.

Three models of private sector engagement were piloted, iterated and launched in Vietnam. A network of private clinics provides testing, treatment, and routine reporting for surveillance. In addition, pharmacies are trained to screen and refer fever cases to the nearest clinic for RDT testing. Finally, PSI...
carried out screening events on four worksites to assess the need for permanent worksite-based services. Of 696 workers tested, 3 positive cases were detected on 2 worksites.

Analysis of the data collected about the location of positive Plasmodium Falciparum (Pf) patients 14 days prior to fever revealed that forest exposure remains a key risk factor as caseloads drop in Vietnam.

Providers scored well on post-training tests, however field-based quality assessments generated lower scores – particularly in the areas of taking patient history and counseling. However, trained private clinics consistently demonstrate correct usage of RDTs and 99% of cases presenting at PSI network clinics receive a confirmatory RDT test before treatment. Securing uninterrupted access to essential commodities (RDTs and first line treatments) remains a challenge.
Looking Ahead

Year 3 of GEMS will benefit from the data and insights gained during its first two years of programming to increasingly target its resources on the providers, channels and locations most likely to detect cases, or where there are gaps in other services available to the most at-risk groups.
In 2018, PSI will continue supporting private sector providers in four countries to deliver quality diagnostic and treatment services, and generate robust surveillance data. In addition to routine data, PSI will conduct operational research and document its lessons learned to generate actionable evidence on the private sector’s contribution to malaria elimination and how to effectively sustain this. Beyond continuing successful strategies, some new initiatives and modifications are being prepared:

COMMUNITY ENGAGEMENT
As malaria transmission becomes more focal in the GMS, PSI is focusing on smarter rather than broader coverage. This requires developing a deeper knowledge of the most at-risk and hard-to-reach groups in terms of understanding where they prefer to seek treatment and what is important to them in their provider. In coordination with malaria partners and ongoing research in the region around at-risk groups, PSI plans to engage these communities in a more active participatory approach to enable them to inform and co-design malaria elimination activities. This shift in approach comes from a recognition that: (a) other elimination efforts credit community engagement as a contributor to success; (b) passive receipt of health-based messaging alone is no longer sufficient to motivate meaningful behavior change for malaria elimination, particularly when malaria is no longer considered a significant risk; and (c) in order to create and sustain the momentum necessary to eliminate malaria, social and contextual dynamics must be better understood, and communities must be engaged to participate in malaria elimination.

PROVIDER MOTIVATION AND PERFORMANCE
In parallel, PSI seeks to better understand provider motivation to sustain quality malaria care until elimination is achieved. As providers see fewer cases each year, both their motivation and their skills may dwindle. PSI employs different types of
financial, material and non-material incentives to motivate providers to perform and report, but are we providing the optimal package? Does motivation change the longer a provider has been with the program? Will changes be necessary as providers see fewer and fewer malaria cases? Qualitative and quantitative research is planned for 2018 to generate evidence that will enable PSI to improve its programming, and to help malaria stakeholders better understand what motivates private providers to continue delivering quality malaria services.

WORKSITES
Research conducted in Cambodia has revealed some challenges facing workers in accessing on-site services, which can include not knowing about the services available, finding the volunteer when needed, or preferring to see a provider who can offer a range of services beyond malaria treating and treatment. As a result of these insights and data analysis, PSI is modifying worksite strategies in Cambodia and Myanmar to increase behavior change communication on site and train worksite volunteers to deliver a wider range of health services. Worksites have also been stratified based on historic caseloads, with some worksites transitioned out of the program (those who have not seen cases for the last one to two years), others have minimal services maintained (e.g. onsite, supervised volunteer and communications), and higher burden worksites will receive a complete package of services, including an onsite, supervised volunteer, orientation and screening on entry of new workers, reactive case detection and mass screening events.

Results of mapping activities and epidemiological data generated in 2017 guided a strategic decision not to pursue a worksite strategy in Lao PDR. In Vietnam, a targeted worksite strategy is evolving, with a tailored approach developed for a small number of specific, high-risk worksites.

NETWORK COVERAGE
In response to contextual or funding shifts, PSI’s networks will be shifting in Year 3.
• The PPM network supported by PSI in Cambodia is now
focused on assigned areas in 2018 as a result of new Global Fund arrangements, and PSI will be supporting the transition of outlets in other areas to different implementing partners.

- PSI Laos has been asked to expand its coverage to additional districts within the five southern provinces (Savanakhet, Saravane, Champassak, Sekong and Attapeu) and will achieve near-complete private sector coverage of these highest burden provinces. The NMCP has also requested PSI to support PPM coverage where sustained transmission is seen in northern provinces targeted for elimination.

- PSI Myanmar is reducing the scale of the non-formal network as a result of decreased funding. Following a data-driven process of selecting the townships with highest transmission and providers most likely to test, treat, and report cases, the network will reduce from 9,339 to 3,150 providers.

- PSI Vietnam is exploring expansion into Khanh Hoa province and piloting models of engagement with non-health outlets to reach forest goers at highest risk. An adapted pharmacy model will expand the availability of RDT testing, enabling pharmacies to test suspected cases before referral.

The GEMS team is grateful for the financial and technical support of the Bill & Melinda Gates Foundation, and the continued partnership and collaboration of the many committed malaria stakeholders in the region. Please contact us for further information or potential cooperation.

**SOURCES**

The GEMS Program works with the private sector to increase access to quality malaria testing, treatment, and surveillance reporting, in accordance with national policies in Cambodia, Lao PDR, Myanmar, and Vietnam.

This report shares the data and insights from the program’s second year of operations and looks ahead to new innovations in 2018 building off these lessons learned.