ACTWATCH OUTLET SURVEY RESULTS

Lao PDR, 2015
## Contents

| Background | 06   | Overview of ACTwatch |
|           | 12   | Country Background   |
|           | 20   | Outlet Survey Methods |

| Results   | 26   | Market Landscape     |
|           | 30   | Market Composition   |
|           | 34   | Antimalarial Availability |
|           | 40   | Malaria Diagnostic Availability |
|           | 44   | Distribution of Antimalarials + Tests |
|           | 48   | Antimalarial Market Share |
|           | 52   | Diagnostic Market Share |
|           | 56   | Private Sector Price  |
|           | 60   | Provider Knowledge   |
|           | 64   | Private Sector Supervision + Reporting |
|           | 68   | Public Private Mix Program |

| Discussion | 78   | Summary               |
|            | 82   | Acknowledgments       |
1.1 background
Overview of ACTwatch
ACTwatch is a multi-country research project implemented by Population Services International (PSI). Standardized tools and approaches are employed to provide comparable data across countries and over time. ACTwatch is designed to provide timely, relevant, and high quality antimalarial and malaria diagnostic testing market intelligence, including information on artemisinin-based combination therapies (ACT), the most effective treatment for malaria. The project was launched in 2008 with funding from the Bill and Melinda Gates Foundation (BMGF) and is currently funded through 2016 by the BMGF, UNITAID, and the Department for International Development (DFID).

Research methods implemented include outlet and household surveys, supply chain studies, key informant interviews, and a new module to document private sector fever case management practices using observation and client exit interviews.

What are the project goals and objectives?

The goal of the ACTwatch project is to provide policymakers with actionable evidence to inform and monitor national and global policy, strategy, and funding decisions for improving malaria case management and elimination efforts. The objectives include: 1) Generation of relevant, timely, and high quality antimalarial market evidence; 2) Identification of strengths and gaps in the antimalarial market performance of the public and private sectors and market readiness to adhere to national guidelines; 4) Dissemination of evidence at national, regional, and international levels, and 5) Reach policy-makers, donors, and programmers with timely evidence to inform policy, strategy, and funding decisions.

Why is ACTwatch relevant?

ACTwatch data provide timely and practical evidence for national malaria programs and their partners. The project monitors antimalarial markets in the context of policy shifts and investments in the scale-up of first-line ACT and blood testing using malaria rapid diagnostic tests (mRDT). This has included adaptation of project methods for the evaluation of the Affordable Medicines Facility-malaria (AMFm) pilot.

In the Greater Mekong Subregion (GMS), the evidence is also important to help inform malaria control strategies that have focused on the containment of artemisinin resistance and a more recent commitment to eliminate malaria in the region by 2030. The emergence of malaria
parasites resistant to artemisinin in the GMS is a serious threat to the recent gains and current ambition of elimination of *Plasmodium falciparum* in the region. As ACTwatch provides market intelligence regarding the performance of both the public and private sectors, as well as provider readiness to adhere to national treatment guidelines, this information will be critical to knowing where there are gaps and opportunities within the different markets.

**What are the outlet surveys?**

Outlet surveys are the core component of the ACTwatch project. In the GMS, project countries include Cambodia, Lao PDR, Myanmar, Thailand, and Vietnam. In sub-Saharan Africa (SSA), outlet surveys have been implemented in Benin, the Democratic Republic of Congo (DRC) (in Kinshasa and Katanga), Kenya, Madagascar, Nigeria, Tanzania, Uganda, and Zambia.

In 2015, with funding from the BMGF, ACTwatch expanded into the GMS. ACTwatch conducted its fourth outlet survey in Cambodia in 2015, a follow-up from surveys implemented in 2009, 2011, and 2013. It was complemented by a fever case management survey, using exit interviews and interviewer observation to address provider practices. In Myanmar, a fourth sub-national outlet survey was conducted in the eastern part of the country in 2015, where surveys have been conducted on a yearly basis since 2012. Unique to Myanmar’s ACTwatch survey in 2015, a nation-wide assessment was conducted, covering coastal areas and borders with India in addition to domains in Eastern Myanmar. In 2015 and 2016, outlet surveys were implemented for the first time in Lao PDR and Thailand, providing a snapshot of the antimalarials available in these markets.

This report presents outlet survey data from Lao PDR implemented in 2015.
What questions are answered by the ACTwatch Outlet Survey?

What types of outlets in the public and private sectors are distributing antimalarials and providing malaria blood testing?

What types of antimalarials and mRDT are available and distributed by the public and private sectors?

What proportion of public and private sector antimalarial-stocking outlets are stocking: 1) quality-assured ACT; 2) non quality-assured ACT; and 3) malaria blood testing?

What is the antimalarial market share of quality-assured ACT relative to the market share for other types of antimalarials?

What is the consumer price for antimalarial medicines and malaria blood testing among private sector outlets?
1.2 background
Country Background
Important gains in malaria control have been achieved in recent years in Lao PDR. Malaria admissions and deaths have declined substantially since 2000. Although the burden of malaria in Lao PDR has been reduced over the past several years, 3.9 million inhabitants, roughly 59 percent of the population, are at some risk of infection. The majority of malaria cases between 2009-2013 occurred among male youth and adults.

Transmission varies greatly by geography and seasonality. The majority of transmission—95 percent of reported cases—occur in five southern provinces. Transmission is very low along the Mekong River plains and in the highlands. The proportion of cases due to *Plasmodium falciparum* (*Pf*) versus *Plasmodium vivax* (*Pv*) are 73 percent and 27 percent, respectively.

At-risk populations for malaria include mobile migrant workers (MMWs), ethnic minority groups, indigenous populations (IPs), and military personnel in the region susceptible to parasite infection—those living in forested areas.

Sources of treatment for malaria

There are over 2,132 private pharmacies and 222 private clinics throughout Lao PDR, most of which can be found in urban areas. These private outlets are generally owned and staffed by off-duty public sector health practitioners. Private pharmacies are regulated by the Food and Drug Department and are staffed by qualified medical personnel. Private regulated pharmacies are categorized into three groups. Level 1 pharmacies are large, employ qualified pharmacists, and can act as pharmaceutical wholesalers. Level 2 pharmacies can sell drugs wholesale but usually do not and only sometimes have pharmacists on staff. Level 3 pharmacies are small, and the owner, who is not a pharmacist, is generally renting a license from a registered pharmacist.

The private sector is highly regulated with regard to authorization to provide malaria case management services. Registered private outlets like level 1, 2 and 3 pharmacies and private for-profit clinics are authorized to test and treat malaria in the private sector. However, unregistered outlets, like village shops, grocery stores, and informal drug stores, are not authorized to provide malaria case management services.

The public healthcare sector is decentralized, and, as such, provincial healthcare facilities are controlled by the provincial government. District health offices manage not only district-level facilities but also the health centers and Village Health Workers (VHWs) located in their district.

Malaria control and elimination strategies

In 2014, the World Health Organization (WHO) used available evidence about artemisinin resistance to define a 3-tier stratification system for targeting action to address drug resistance. Areas designated as Tier 1 were prioritized for immediate multifaceted response to contain or eliminate resistance. Areas designated as Tier 2 were prioritized for intensified malaria control to reduce transmission and/or limit the risk of emergence or spread of resistant parasites. Tier 3 areas had no evidence of artemisinin resistance and limited contact with Tier 1 areas. However, recent findings suggest that artemisinin resistance is not only spreading but also emerging *de novo*. As such, the importance of not only preventing the spread of resistance from foci but of eliminating malaria in the region has increased. In consequence of this strategic reorientation, it is being
• All suspected malaria cases should receive parasite-based diagnosis using a rapid diagnostic test or microscopy.
• The recommended first-line treatment for uncomplicated malaria in adults is a 3-day regimen of Artemether 20mg + Lumefantrine 120 mg (AL).
• Following treatment failure with AL, the second-line treatment is quinine + doxycycline for *Pf* malaria and chloroquine + primaquine (PQ) for *Pv* malaria.
• At the provincial level, it is officially recommended that after a *Pv* case is treated with AL, it should be followed by a 14-day regimen of PQ.
• The first-line treatment for severe malaria is intravenous (IV) or intramuscular (IM) artesunate, although IV injection is preferred. Every 24 hours a 2.4 mg/kg dose should be administered until the patient can tolerate oral AL for 3 days. Quinine is recommended to treat severe malaria when artesunate is contraindicated or not available.
• The recommended first-line treatment for malaria in pregnancy is quinine for *Pf* malaria and chloroquine for *Pv* malaria in the first trimester of pregnancy and the recommended ACT (AL) in the second and third trimesters.
recommended that tier 3 areas be reclassified as tier 2 (abandoning tier 3 category).

### Malaria case management and elimination in Lao PDR

In line with the WHO Strategy for Malaria Elimination in the GMS, the dual goal has been set to both interrupt transmission of *Pf* malaria in areas of multidrug resistance as well as to reduce malaria transmission in high transmission areas to less than one case per 1,000 population by 2020.

By 2025, Lao PDR targets elimination of *Pf* and *Pv* malaria from all northern provinces and elimination of *Pf* in the four southern-most provinces. Lao PDR has set the goal of eliminating malaria by 2030. To increase access to quality-assured ACT and diagnosis, in 2010, approximately 5,239 VHWs were trained across Lao PDR to provide increased access to malaria case management in rural areas.

Malaria diagnosis and treatment has been free in the public sector since 2005. Though artemether-lumefantrine (AL) was designated as the first-line treatment for uncomplicated malaria in 2005, it was initially only legally permitted for distribution in the public sector. AL brands procured by the Global Fund include Coartem®, Artefan®, Combiart®, and generic AL manufactured by Ipca.

### Private Sector Engagement and Regulation

In an effort to expand access to antimalarials and mRDT in the private sector, the Public Private Mix (PPM) program was initiated. Under this program, antimalarials and diagnostic commodities are distributed in PPM-registered private hospitals and pharmacies. The PPM program was launched in 2008 in eight districts of four target provinces and was expanded to 22 districts in eight provinces by 2014. In 2015, there were 245 private pharmacies and 16 clinics enrolled in the PPM program, which have been trained on prescription and usage of ACT and mRDT, and to report usage data to the district health office.

Beginning in 2015, PPM outlets focused on testing and treatment of patients for malaria. PPM outlets are also encouraged to test patients using mRDT rather than microscopy, with the expectation that by 2020, microscopy will no longer be used for malaria testing in PPM outlets. This approach is consistent with the national policy of reducing microscopy and increasing the use of mRDT for malaria confirmation. In 2013, 47 percent of malaria cases were detected using mRDT in PPM outlets.

Participating PPM outlets are provided commodities free of charge but are authorized to distribute the ACT and mRDT for a maximum of 1,000 Kip (US $.12) and 2,000 Kip (US $.25), respectively. Despite this financial incentive, many outlets choose not to charge for these commodities.
By 2025, Lao PDR targets elimination of \textit{Pf} and \textit{Pv} malaria from all northern provinces and elimination of \textit{Pf} in the four southern-most provinces. Lao PDR has set the goal of eliminating malaria by 2030. A number of objectives and strategies have been set to do this. ACTwatch data can help to provide insights with regard to these strategies, and in particular the strategies outlined in Objective 2.

Objective 2 of the Elimination Plan: Achieve universal coverage of case management by 2018 to ensure 100% parasitological diagnosis of all suspected cases and prompt and effective treatment of all confirmed cases.

For a program to successfully achieve elimination, it is imperative that all suspected cases be diagnosed and confirmed with a parasitological diagnostic test. Any patient presenting to a health facility or other authorized care provider with symptoms of malaria must be tested to determine whether treatment is necessary. Prompt identification and treatment of symptomatic infections helps halt onward transmission.

Following confirmation by mRDT or microscopy, it is imperative that the malaria patient is promptly treated with a quality-assured antimalarial according to national treatment guidelines. Healthcare workers will provide treatment strictly based on the results of parasitological testing, regardless of presenting signs and symptoms.

To meet this objective, several strategies are in place for which ACTwatch data can provide important and timely information to help frame the current antimalarial and diagnostic landscape:

1. **Strategy 2.1 Increase access to and utilization of malaria diagnostics to strengthen parasitological detection of malaria infections**
   - ACTwatch will provide measures of diagnostic availability, price, and market share, as well as how often outlet providers report administering a malaria test in the previous week.

2. **Strategy 2.2 Provide prompt, efficacious treatment of all confirmed cases according to national treatment guidelines**
   - ACTwatch will measure the availability of ACT treatment in the public and private sectors, including the price of treatment relative to a test, and the market share of antimalarials. ACTwatch will also provide insights into provider knowledge of the first-line treatment, as well as the extent to which providers report receiving malaria training. It will also measure the percent of providers that reportedly keep documentation of caseload data and report on this.

3. **Strategy 2.3 Strengthen existing PPM facilities and expand PPM program to include all qualified providers in burden reduction and transitional areas**
   - The Public-Private Mix program remains an effective approach to increasing the number of reliable access points for early diagnosis and treatment in the country, particularly in underserved and hard-to-reach communities, by leveraging healthcare providers in the established private sector.
   - ACTwatch will provide insights into the performance of the PPM program with regard to its core indicators.
Laos timeline

2005
Malaria testing and treatment free in the public sector.

2007
Oral AMT outlawed.

2005
Artether Lumefatrine becomes first ACT to be first-line antimalarial.

2008
Public Private Mix (PPM) program launches in 8 districts.
2010
G6PD testing required with prescription of Primaquine.

2014
Artemisinin Resistance detected in Attapeu Province.

2014
PPM expands to 22 districts.

2013
Artemisinin Resistance detected in Champasack Province.

2020
Goal set to interrupt transmission of Pf in areas of multidrug resistance as well as reduce transmission in high transmission areas to 1/1000 population.
1.3 background
Outlet Survey Methods
ACTwatch implements standardized methods and questionnaires that allow for comparisons between countries and across survey rounds. A full census of all outlets providing malaria care and a full audit of all available antimalarials provides a complete picture of the antimalarial market.

How is the sampling conducted?

A representative sample of clusters is selected from each research domain. Typically, a one-stage probability-proportional-to-size (PPS) cluster design is used to select clusters within each domain, with cluster population serving as the measure of size. The primary sampling unit, or cluster, is usually an administrative unit with 10,000 to 15,000 inhabitants. In Lao PDR, village groups in the southern five provinces (Attapeu, Champasak, Salavan, Savannakhet, and Sekong) were selected. Selection of units with PPS was completed based on population estimates obtained from the Lao National Statistics Centre.

A booster sample was added to the survey, in which the boundaries for the outlet census were extended to the district level for private health facilities and pharmacies. Including all private health facilities and pharmacies at the district level was estimated to yield a sufficient sample size for estimating regulated private sector malaria testing and treatment availability.

What types of outlets are screened?

The main types of outlets screened include public and not-for-profit health facilities, community health workers, private health facilities, pharmacies, drug stores, village shops/grocery stores, and itinerant drug vendors. Outlets are classified using these broad definitions across each of the ACTwatch countries. However, within each country, a range of outlet types are considered relevant and included.

In Lao PDR, outlets screened in the public sector included provincial and district hospitals, health centers, health posts, and village health workers, and in the private sector, private hospitals and clinics, clinical pharmacies, level 1, 2 and 3 pharmacies, drug stores, grocery stores, and mobile vendors. These outlets were classified according to the broader outlet definitions during the analysis phase.

How are the outlets identified?

The ACTwatch outlet survey includes all outlets with the potential to sell antimalarial medicines or diagnostics. As many of these outlets may be unregistered, mobile, or recently opened, official listings of these shops and their locations are not typically available. A census approach is therefore implemented, supported by the use of key informant interviews with local officials, local maps, and lists of registered outlets where available.

What is an outlet census?

This involves a team of data collectors moving systematically through a defined area in order to identify all outlets that have the potential to sell or distribute antimalarials or malaria diagnostic testing.

What happens after an outlet is identified?

The outlet is screened for availability of malaria medicines or malaria diagnostic testing. Outlets are included in the survey if they have antimalarials or malaria diagnostic tests in stock at the time of survey or if they had antimalarials in stock in the previous 3 months. Permission to conduct the interview is obtained from the main provider.

How is information on antimalarials and malaria rapid diagnostic tests captured?

Among outlets with antimalarials or/malaria tests in stock, a full audit of the antimalarials and malaria rapid diagnostic tests (mRDT) is conducted. Information is recorded for each unique antimalarial and mRDT identified in the outlet. Vietnamese speaking data collectors were hired to ensure that data from outlets staffed by Vietnamese speakers were accurately captured.
What information is recorded on audit sheets?

The audit sheet captures product information from the product package, including the brand name, the manufacturer, country of manufacture, formulation, and strength. The audit sheet also captures information from the provider, including the amount sold in the last seven days and retail price. If a particular product is available in multiple package sizes, strengths, or formulations, an audit sheet is completed for each unique product. Information gathered for every antimalarial and mRDT in stock allows for a complete picture of the market with regard to availability, price, and relative market share.
A closer look at the outlet types

What types of outlets were included?

The study population is defined as all outlets with the potential to sell or distribute antimalarial medicines and/or provide malaria blood testing. The classification of different outlets was based on discussions with national stakeholders to determine appropriate categories of outlets to screen as part of the census approach.

<table>
<thead>
<tr>
<th>Outlet Type</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Public Health Facilities</strong></td>
<td>Provincial Hospitals, District Hospitals, and health centers. This category is comprised primarily of government facilities, but could include a small number of military and police hospitals that serve both service members and the general public.</td>
</tr>
<tr>
<td><strong>Community Health Workers</strong></td>
<td>Village Health Workers are equipped with antimalarial treatment and mRDT and are found at the village level.</td>
</tr>
<tr>
<td><strong>Private For-Profit Health Facilities</strong></td>
<td>Private hospitals, clinics, and diagnostic laboratories.</td>
</tr>
<tr>
<td><strong>Pharmacies</strong></td>
<td>Pharmacies are licensed and regulated by a national regulatory authority and are staffed by pharmacists and qualified health practitioners. These include Levels 1, 2 and 3 pharmacies as well as clinical pharmacies. Clinical pharmacies are those that offer clinical and pharmaceutical services despite only being licensed to offer pharmaceutical services. Level 1 pharmacies are large, can act as wholesalers, and have pharmacists on staff to advise patients on treatment. Level 2 pharmacies, while smaller, can still act as wholesalers but only sometimes have pharmacists on staff to advise patients. Level 3 pharmacies are small, and the owner, who is not a pharmacist, rents a pharmacy license from a pharmacist.</td>
</tr>
<tr>
<td><strong>Drug Stores</strong></td>
<td>Drug stalls in rural markets and shops that primarily sell medicines. These outlets are not guaranteed to be staffed by qualified health dispensers / practitioners and are not licensed by a national regulatory authority.</td>
</tr>
<tr>
<td><strong>General retailers</strong></td>
<td>Grocery stores and village shops that typically sell fast-moving consumer items.</td>
</tr>
<tr>
<td><strong>Itinerant Drug Vendors</strong></td>
<td>Mobile drug vendors found primarily in rural areas, typically working within a radius of their home. They are not registered with any national regulatory authority. In Lao PDR mobile vendors often cater to the mobile migrant populations.</td>
</tr>
</tbody>
</table>
2.1 results
Market Landscape

Availability of antimalarials and diagnostics among all screened outlets

This section describes availability of antimalarials and malaria tests among all outlets that were screened in the survey. There was considerable diversity across outlet types with regard to availability of antimalarials and malaria tests. Results suggest relatively high availability among public health facilities and moderate availability among pharmacies with regard to availability of antimalarials. Malaria tests were commonly available in public health facilities, but lower availability was observed among community health workers (CHW), private for-profit facilities, and pharmacies.
Several strategies have been implemented in Lao PDR to ensure increased access to antimalarials and diagnostic tests in the public sector, including the expansion of malaria testing and treatment among Village Malaria Workers (VMWs) by the Center for Malaria Parasitology and Entomology (CMPE). There has also been an increased focus on strengthening the private sector. This has included increased regulation, licensing, and supervision of private for-profit facilities and pharmacies.

What is the availability of antimalarials across the public and private sector outlets in 2015?

In the public sector, almost all public health facilities had an antimalarial in stock on the day of survey (97.8%). One in three CHWs had an antimalarial in stock on the day of survey. In the private sector, around 70% of pharmacies had antimalarials available. Availability of antimalarials was lower among other private sector outlet types (private for-profit health facilities, 36.5%; drug stores, 22%; and itinerant drug vendors, 5.3%). Of the 6,295 general retailers that were included in the study, the vast majority did not stock antimalarials (0.5% antimalarial availability).
What types of public and private sector outlets stocked malaria tests in 2015?

In 2015, availability of malaria tests among outlets varied considerably across the public and private sectors and by outlet type. Among all outlets screened in the public sector, the percentage of public health facilities with at least one malaria test in stock on the day of the survey was close to 90%. One in three CHWs had a malaria test. In the private sector, availability of malaria tests was variable across outlet type, with 48% of private for-profit health facilities and 40% of pharmacies stocking a malaria test. Other private sector outlet types did not have tests available.

AVAILABILITY OF MALARIA DIAGNOSTIC TESTS AMONG ALL SCREENED OUTLETS, 2015

Most public health facilities have diagnostic tests, and one-third of CHWs had testing available. Half of private for-profit health facilities and more than 40 percent of pharmacies had diagnostic tests. Malaria tests were not available in other outlet types.
2.2 results
Market Composition

The relative distribution of outlets stocking antimalarials and diagnostics.

This section summarizes market composition by illustrating the distribution of outlets stocking at least one antimalarial and the distribution of outlets that stock malaria blood testing. Public sector outlets accounted for the majority of outlets that stock malaria testing and treatment in southern Lao PDR.
What types of outlets stock antimalariais?

Public sector outlets accounted for the majority of outlets stocking antimalariais throughout southern Lao PDR. More than half of the antimalariai-stocking outlets (65.1%) were CHWs (42.5%) and public health facilities (22.6%). Private sector outlets accounted for 34.9% of outlets stocking antimalariais, including pharmacies (22.8%), general retailers (6%), and private for-profit health facilities (4.3%).

What types of outlets stock malaria blood testing?

The public sector, including CHWs (50.5%) and public health facilities (26.3%), accounted for the majority of outlets with malaria blood testing available. The private sector accounted for 23.2% of all outlets with malaria blood testing available, with the largest contribution coming from pharmacies (15.3%).
DIAGNOSTIC MARKET COMPOSITION, 2015

The types of outlets that stock antimalarials and that provide malaria blood testing are similar in southern Lao PDR.
2.3 results
Antimarial Availability

Availability of different types of antimalarials, among outlets with antimalarials in stock

This section shows the availability of: 1) the national first-line treatment, artemether lumefantrine (AL); 2) chloroquine; 3) oral artemisinin monotherapy; and 4) any antimalarial that is not part of the national treatment guidelines. Results show that AL is widely available in antimalarial-stocking public and private health facilities and with CHWs. Antimalarial medicines that are not part of the national treatment guidelines are infrequently available, and oral artemisinin monotherapy is generally not available.
How does ACTwatch present availability of different antimalarial medicines?

The availability of specific antimalarial medicines is restricted to those outlets that have antimalarials in stock. For example, the availability of ACT is measured as the proportion of outlets stocking ACT, among all outlets with at least one antimalarial in stock.

Is the national first-line ACT available in the public and private sectors?

The recommended first-line treatment for uncomplicated malaria in adults is a three-day regimen of artemether lumefantrine (AL). Nearly all public health facilities (99.5%) and the majority of CHWs (83.1%) with antimalarials in stock were stocking AL on the day of the survey. Availability was lower among antimalarial-stocking private sector outlets, including private for-profit health facilities (63.3%), pharmacies (51.7%), and general retailers (3.1%).

What is the availability of non-artemisinin monotherapy?

Chloroquine was the most commonly available non-artemisinin monotherapy during the 2015 outlet survey. The vast majority of non-artemisinin monotherapies audited in southern Lao PDR were chloroquine tablets. Chloroquine liquid injections and syrups were also available. Very few other non-artemisinin monotherapies were found, but included quinine and primaquine. Chloroquine is no longer indicated as a first-line treatment for malaria, but chloroquine tablets are indicated as second-line treatment.

Private sector antimalarial-stocking outlets were commonly stocking chloroquine. Availability was particularly high among general retailers (96.9%) as well as pharmacies (74.6%). Availability was much lower among public sector outlets, including CHWs at 19.2% and public health facilities at 4.6%.
Only 1 oral AMT product was audited in the 2015 outlet survey. This product, artesunate tablets, was found in a private for-profit health facility.

What is oral artemisinin monotherapy?
Artemisinin monotherapies include artemether, artesunate, dihydroartemisinin, and arteether. Oral artemisinin monotherapies are available in tablet and suspension formulations. Non-oral artemisinin monotherapy includes powder and liquid injections as well as suppositories. Oral artemisinin monotherapy is strictly regulated in all study countries because its use can fuel the spread of artemisinin drug resistance. Non-oral artemisinin monotherapy medicines are typically indicated for management of severe malaria.

AVAILABILITY OF CHLOROQUINE, 2015
Chloroquine was widely available in the private sector. Almost all antimalarial-stocking general retailers had chloroquine in stock and 75% of pharmacies and 50% of private for-profit health facilities were stocking chloroquine.
Are treatments that are not part of the national treatment guidelines available in the public and private sectors?

Antimalarial medicines that were found during the outlet survey and are not listed in the national treatment guidelines were primarily chloroquine injections and syrups. Availability of antimalarial medicines that were not in the national treatment guidelines was generally low, and these products were most commonly found among antimalarial-stocking pharmacies (16.4%) and private for-profit health facilities (11.1%).

**AVAILABILITY OF ANTIMALARIALS THAT ARE NOT PART OF THE NATIONAL TREATMENT GUIDELINES, 2015**

Antimalarials that are not part of the national treatment guidelines were not commonly available. About 1 in 10 private sector outlets with antimalarials in stock were stocking a medicine that was not part of the guidelines, and these medicines were typically chloroquine injections and syrups.
2.4 results
Malaria Diagnostic Availability

Availability of malaria diagnostics, among outlets with antimalarials in stock.

This section summarizes availability of malaria blood testing, including both malaria microscopy and rapid diagnostic testing, among outlets with an antimalarial in stock. The results show high availability of confirmatory testing among public and private health facilities and CHWs. About half of pharmacies with antimalarials had malaria blood testing available.
Early diagnosis and treatment is one of the cornerstones of the national malaria control strategy in Lao PDR. Malaria rapid diagnostic tests (mRDT) have been in use at scale since 2008 and are to be used at health facilities as well as at the community level. At district and provincial hospitals, there is an emphasis on diagnosis by malaria microscopy. Through the Public Private Mix (PPM) program, providers at private for-profit health facilities and pharmacies in select districts have been trained and equipped to use mRDT.

Where antimalarials are distributed, is confirmatory testing available?

The availability of malaria blood testing (including microscopy and mRDT) was high among antimalarial-stocking outlets in the public sector. Nine in ten (90.8%) public health facilities and 78.4% CHWs had tests available. In the private sector, 77% of private for-profit health facilities had blood tests available, whereas 55.7% of pharmacies and only 6.1% of general retailers had blood tests available.

Most outlets with malaria blood testing available had mRDT in stock. Malaria microscopy was only available in public (23.1%) and private health facilities (16%) (data not shown).

**AVAILABILITY OF MALARIA BLOOD TESTING (MALARIA RDT OR MICROSCOPY), 2015**

The majority of public and private health facilities and CHWs that had antimalarials available also had malaria RDTs or microscopy available. About half of antimalarial-stocking pharmacies had malaria blood testing available.
results
Distribution of Antimalarials and Tests

*Distribution or sales of malaria commodities, among outlets with antimalarials or/and mRDT in stock.*

This section summarizes the percentage of outlets with malaria commodities (antimalarials and mRDT) that report selling or distributing antimalarials or tests during the week prior to the survey. This indicator shows how common it is for outlets to distribute malaria commodities to patients. This indicator is particularly important for countries with low and declining malaria endemicity. In southern Lao PDR, nearly half of outlets with malaria testing available reported performing a test in the past week, whereas only one in five outlets with antimalarials reported distributing an antimalarial treatment within the past week.
Where malaria blood testing and antimalarials are available, was there any distribution to individual customers in the previous week?

Among outlets with malaria blood testing available, tests were reportedly performed within the past week among the majority of public health facilities (66.2%) and private for-profit health facilities (70.6%) as well as among about one-third of CHWs (30.5%) and pharmacies (37.3%). The median number of tests performed in public and private health facilities in the previous week was 2 tests (data not shown). Among outlets with antimalarials in stock, distribution of antimalarials in the past week was less frequent relative to performing malaria blood tests. The percentage of outlets with antimalarials in stock that reported distributing antimalarials in the past week was highest among private sector outlets, including private for-profit health facilities (40.1%), general retailers (32.2%), and pharmacies (30.3%), compared to only 19.7% of public health facilities and 11.3% of CHWs.

PERCENTAGE OF OUTLETS WITH MALARIA BLOOD TESTING AVAILABLE THAT SOLD OR DISTRIBUTED A MALARIA BLOOD TEST, AND PERCENTAGE OF ANTIMALARIAL-STOCKING OUTLETS THAT SOLD OR DISTRIBUTED ANTIMALARIALS IN THE PREVIOUS WEEK, 2015

Nearly half of outlets with malaria testing available reported performing a test in the past week whereas only one in five outlets with antimalarials reported distribution in the same time frame.
2.6 results
Antimalarial Market Share

Relative sale or distribution of antimalarials in the week preceding the survey

This section summarizes relative antimalarial market share for the public and private sectors and for different types of antimalarials. Market share findings from southern Lao PDR show that the private sector is responsible for distributing the majority of antimalarial medicines, with pharmacies dominating the market. Fewer than half of all antimalarials distributed were national first-line treatments (AL).
What types of antimalarials are distributed in Lao PDR?

All antimalarials distributed in southern Lao PDR were the national first-line treatment (AL) or chloroquine. AL accounted for 37.8% of the market share and chloroquine for 62.2%.

What types of outlets distribute antimalarials?

The private sector was responsible for more than half of all antimalarial distribution (67.5%), including pharmacies (52.8%), private for-profit health facilities (7.2%), and general retailers (6.6%). CHWs were responsible for 9% of antimalarials distributed, and public health facilities distributed about one in four antimalarial treatments (23.4%).

How is antimalarial market share defined?

Provider reports on the amount of the drug sold or distributed during the week preceding the survey were used to calculate market share for the following types of antimalarials: ACT, non-artemisinin therapy, oral artemisinin monotherapy and non-oral artemisinin monotherapy. The volume of each drug distributed is the number of ‘adult equivalent treatment doses’ (AETDs) that were reportedly sold/distributed during the week preceding the survey. Measures include all dosage forms (tablet and non-tablet).
 ANTIMALARIAL MARKET SHARE, 2015

The private sector is responsible for distributing the majority of antimalarial medicines, with pharmacies dominating the market. Fewer than half of all antimalarials distributed were national first-line treatments (AL).

LEGEND
- AL
- Chloroquine
results
Diagnostic Market Share

*Relative sale or distribution of malaria tests in the week preceding the survey*

This section summarizes relative market share for malaria microscopy and mRDT in the public and private sectors. The majority of malaria blood testing is provided in the public sector, and most testing is performed using mRDT.
Is malaria microscopy or mRDT testing more common in Lao PDR?

The majority of malaria testing was performed using mRDT (77.9%) compared to malaria microscopy (22.1%). All of the mRDT used in the public sector were tests from the manufacturer Standard Diagnostics. In the private sector, mRDT market share was divided into about one-third Standard Diagnostics, one-third CTK Biotech, and one-third various other manufacturers (data not shown).

What types of outlets provide malaria blood testing?

The public sector was responsible for the majority of malaria blood testing with 74.6% of the total testing market share. This includes more than half of all testing conducted by public health facilities (56.6%) and nearly one in five tests conducted by CHWs (18.1%). Within the private sector, private for-profit health facilities accounted for 17.7% of all tests conducted.
MALARIA BLOOD TESTING MARKET SHARE, 2015

The public sector was responsible for 75% of all malaria blood testing in southern Laos PDR. Approximately 4 in 5 malaria tests were performed using malaria RDTs.
2.8 results
Private Sector Price

Median price for malaria testing and treatment in the private sector

This section presents median private sector price for mRDT testing as well as AL and chloroquine treatments. Treatment prices are presented as price for one adult equivalent treatment dose (AETD), or the amount of medicine needed to treat a 60kg adult. Due to the Public Private Mix (PPM) program, mRDT testing and AL treatment in the private sector tend to be free, whereas chloroquine is not provided free-of-charge.
What is the price of an adult ACT compared to an mRDT?

The median private sector price for both AL and mRDT testing was $0.00. Although AL was generally provided free-of-charge in private for-profit health facilities and pharmacies, the median price of mRDT testing was $2.50 in health facilities compared with $0.00 in pharmacies. The median price for one adult equivalent treatment dose of chloroquine was $0.62 in private for-profit health facilities, pharmacies, and general retail outlets.
results
Provider Knowledge

This section addresses provider knowledge about the first-line treatment for malaria, AL. Providers stocking antimalarials were asked to cite the first-line treatment for malaria and the dosing regimen for an adult. Providers in public and private health facilities and CHWs were generally knowledgeable about AL and appropriate dosing. Knowledge was lower among pharmacies and general retailers.
Do providers know the first-line treatment for uncomplicated malaria?

Providers in the public sector were generally knowledgeable about the national first-line treatment (AL) at 89.5% of public health facilities and 72.6% of CHWs. In the private sector, 78.7% of private for-profit health facilities cited AL as the national first-line treatment, and 49.5% of pharmacies and 8.1% of general retailers had knowledgeable providers.

Do providers know the first-line dosing regimen for uncomplicated malaria?

More than half of providers could correctly cite the first-line dosing regimen for uncomplicated malaria among public health facilities (73.0%), CHWs (51.3%) and private for-profit health facilities (66.4%). Knowledge was lower among providers in pharmacies (36.5%) and general retailers (6.1%).
CORRECT KNOWLEDGE OF THE AL DOSING REGIMEN FOR ADULTS, 2015

More than half of providers at public and private health facilities and CHWs demonstrated correct knowledge of AL dosing regimen for adults. Only about one-third of providers in pharmacies could correctly state the AL dosing regimen.
2.10 results
Private Sector Supervision and Reporting

This section addresses the extent to which private providers who stock antimalarials have received a supervisory visit within the past year, and whether or not they capture and report malaria caseload data to government or non-governmental organizations. About half of private sector outlets providing malaria testing or treatment reported receiving supervision within the past year, and one-third record and report caseload data.
Do private sector outlets providing malaria testing and/or treatment receive supervisory or regulatory visits?

About half of all private sector outlets providing malaria testing or treatment reported receiving a supervisory or regulatory visit within the past year (46.7%). Supervisory or regulatory visits within the past year were most common among private for-profit health facilities (50.2%) and pharmacies (62.1%) and less common among general retailers (11.5%).

PERCENTAGE OF PROVIDERS WHO REPORTEDLY RECEIVED A SUPERVISORY OR REGULATORY VISIT WITHIN THE PAST YEAR, 2015

*About half of private sector outlets providing malaria testing or treatment reported receiving supervision within the past year.*

Do private sector outlets providing malaria testing and/or treatment track and report malaria caseload data?

Recording caseload data and reporting it to government or non-governmental organizations was most common among private for-profit health facilities (65.1%) and pharmacies (54.5%). Caseload reporting was not common among general retailers (2.5%). Overall, 41.9% of private sector outlets reported capturing and reporting caseload data.
To what extent are providers in line with the national treatment guidelines with regard to training, supervision, caseload reporting, and access to malaria commodities?

The percentage of outlets that reportedly received training and supervision was low overall and highest among private for-profit health facilities (13%) and pharmacies (11%). The percentage of outlets that reportedly received training and supervision and had the first-line treatment and malaria blood testing in stock was only 11% in private for-profit health facilities and less than 7% across all other outlet types. Less than 10% of all private sector outlet types met the indicator criteria.

PERCENTAGE OF PROVIDERS WHO REPORTEDLY REPORT CASELOAD NUMBERS TO GOVERNMENT OR NON-GOVERNMENTAL ORGANIZATIONS, 2015

More than one-third of private sector outlets providing malaria testing or treatment report capturing and reporting caseload data to government or non-governmental organizations.
2.11 results
This section summarizes key indicators presented among private for-profit health facilities and pharmacies located in districts with and without the Public Private Mix (PPM) program. Findings illustrate that private sector outlets are more commonly equipped for appropriate malaria case management in PPM districts compared to private outlets in non-PPM districts.
What is the PPM Program?

The PPM program was launched in 2008 with the aim of increasing access to malaria diagnosis and treatment and removing poor-quality antimalarials from the private sector. Under the PPM program, AL and mRDT are distributed to PPM-registered private hospitals and pharmacies. Of the 41 districts included in the 2015 outlet survey, 25 districts were part of the PPM program.
Availability of the first-line ACT

Among antimalarial-stocking private for-profit health facilities in PPM districts, 72.8% had the national first-line ACT (AL) in stock on the day of the survey compared to only 21.9% in non-PPM districts. The majority of antimalarial-stocking pharmacies in PPM districts had AL in stock (67.3%) whereas in non-PPM districts, no antimalarial-stocking pharmacies had AL in stock.

**Availability of the first-line ACT, among outlets in PPM and non-PPM districts, 2015**

The majority of private sector outlets in non-PPM districts do not stock AL as compared with availability in about 7 in 10 private sector outlets in PPM districts.
Availability of chloroquine

In districts with the PPM program, fewer than half of antimalarial-stocking private for-profit health facilities had chloroquine in stock (43.2%) compared to 78.1% in non-PPM districts. Similarly, 67.1% of pharmacies in PPM districts had chloroquine in stock compared to nearly all (99.4%) in non-PPM districts.

AVAILABILITY OF CHLOROQUINE, AMONG OUTLETs IN PPM AND NON-PPM DISTRICTS, 2015

Chloroquine is available in most private sector outlets with antimalarials in non-PPM districts. Chloroquine is also widely available in more than half of private sector outlets in PPM districts.
Availability of malaria blood testing

Malaria blood testing availability was notably higher among pharmacies in PPM districts (71.6%) versus non-PPM districts (4.7%). Availability was similar among private for-profit health facilities in PPM (78.6%) versus non-PPM districts (70.2%).

**Availability of Malaria Blood Testing, Among Antimalarial-Stocking Outlets in PPM and Non-PPM Districts, 2015**

*Availability of malaria blood testing among private sector outlets in PPM districts was over 70% as compared to approximately 10% in non-PPM districts.*
Antimalarial market share

Private sector outlets in PPM districts accounted for 15.7% of all antimalarials distributed in southern Lao PDR, including market share for private for-profit health facilities in PPM districts (2.2%) and pharmacies in PPM districts (13.5%). In non-PPM districts, pharmacies and private for-profit health facilities distributed chloroquine exclusively. In PPM districts, private for-profit health facilities only distributed AL. While PPM-district pharmacies distributed AL, the primary antimalarial medicine that they distributed to consumers was chloroquine.

Name the first-line dosing regimen for an adult

Providers stocking malaria medicines or diagnostics were asked to name the first-line treatment for uncomplicated malaria (AL) and to cite the dosing regimen for an adult. Correct provider knowledge about the AL dosing regimen was higher among both private for-profit health facilities (76.0%) and pharmacies (46.8%) in PPM districts compared to non-PPM districts (private facilities, 25.3%; pharmacies, 3.7%).

CORRECT KNOWLEDGE OF THE NATIONAL FIRST-LINE TREATMENT DOSING REGIMEN FOR ADULTS, AMONG OUTLETS IN PPM AND NON-PPM DISTRICTS, 2015

In PPM districts, about half of all private sector providers providing malaria diagnosis and/or treatment can correctly cite the AL dosing regimen for an adult. Knowledge is much lower among private providers in non-PPM districts.
PERCENTAGE OF PROVIDERS WHO REPORTEDLY RECEIVED A SUPERVISORY OR REGULAR VISIT WITHIN THE PAST YEAR, AMONG OUTLETS IN PPM AND NON-PPM DISTRICTS, 2015

Nearly 75% of private sector providers providing malaria diagnosis and/or treatment received a supervisory or regulatory visit in the past year in PPM districts.
Supervisory visits

Supervisory or regulatory visits within the past year to private sector providers stocking malaria medicines or diagnostics were reportedly higher among outlets in PPM districts compared to outlets in non-PPM districts. Differences were notable among pharmacies (73.5% versus 25.8%, respectively) and private for-profit health facilities (64.6% versus 23.1%, respectively).

Report numbers of patients tested/treated

While the majority of pharmacies in PPM districts reportedly report the numbers of patients tested/treated for malaria (71.8%), pharmacies in non-PPM districts do not reportedly report such information to government or non-governmental organizations. Among private for-profit health facilities, data trends suggest higher levels of reporting in PPM (73%) versus non-PPM districts (49.7%).

**PERCENTAGE OF PROVIDERS WHO REPORTEDLY REPORT CASELOAD NUMBERS TO GOVERNMENT OR NON-GOVERNMENTAL ORGANIZATIONS, AMONG OUTLETS IN PPM AND NON-PPM DISTRICTS, 2015**

Nearly 75% of private sector providers providing malaria diagnosis and/or treatment record and report malaria caseload data in PPM districts.
3.0 summary
Summary
Findings from the 2015 ACTwatch malaria diagnostic and medicine outlet survey show that public sector readiness for appropriate case management is high in southern Lao PDR. Nearly all screened public health facilities (98%) had the national first-line ACT (AL) in stock. Among CHWs stocking antimalarials, about three-quarters had AL in stock. Malaria blood testing was available in about 9 out of 10 public health facilities and nearly 80% of CHWs stocking antimalarials.

The outlet survey included an audit of all available antimalarials in the public and private sectors. Nearly all antimalarials audited were either chloroquine tablets or the national first-line ACT, AL tablets. Only 1 box of oral artemisinin monotherapy (artesunate tablets) was found during the survey, which included screening more than 7,500 outlets for antimalarial availability and auditing antimalarials in 236 public and 394 private sector outlets. The study also found low availability of antimalarial medicines that are not indicated in the national treatment guidelines. About 1 in 10 private sector outlets were stocking a medicine that is not in the treatment guidelines, and these were primarily chloroquine syrups and injections.

The outlet survey identified that the private sector plays an important role in malaria case management, delivering nearly 70% of all antimalarials to consumers. Pharmacies alone accounted for more than half of all antimalarial distribution. Other private sector outlets distributing antimalarials included private for-profit health facilities and general retailers, each with about 7% of the total antimalarial market share. Most private sector outlets that stock antimalarials were stocking and distributing chloroquine (primarily tablets). Chloroquine is no longer indicated as the first-line treatment for Pf nor Pv malaria but is still indicated as a second-line treatment. Nearly 80% of private sector outlets with antimalarials had chloroquine available compared to about 40% stocking the first-line ACT, AL. Chloroquine accounted for the majority of antimalarials distributed to consumers, comprising more than 60% of the antimalarial market share, with this large market share due to distribution in the private sector.

The study was conducted in 25 districts with the Public Private Mix (PPM) program and 16 districts without the program. This allowed for comparison of key indicators among pharmacies and private for-profit health facilities in PPM and non-PPM districts. These comparisons showed that private sector outlets in districts with the PPM program tend to be better equipped to appropriately manage malaria compared to outlets in non-PPM districts. The differences were particularly striking for pharmacies, which do not tend to stock first-line ACT or mRDT in non-PPM districts but had high availability of these commodities in PPM districts (about 70% stocking). Nearly 75% of private sector outlets in PPM districts stocking antimalarials or malaria diagnostics reported receiving a supervisory or regulatory visit within the past year and record and report malaria caseload data into national systems.

Although private sector outlets in PPM districts are better equipped with testing and AL treatment, more than 60%
were stocking chloroquine, and these outlets more frequently distributed chloroquine than AL. This is despite the fact that AL is reportedly available free-of-charge to consumers due to the PPM program, whereas the median private sector price for an adult treatment dose of chloroquine was $0.62.

The public sector is responsible for the majority of malaria testing (75%), and most malaria testing is conducted using mRDT rather than microscopy (nearly 80%). Among public health facilities with malaria testing available, the median number of tests performed in the week preceding the survey was 2, suggesting that, at least during the study period (November-December), facilities in southern Lao PDR tend to perform malaria tests on a weekly basis.

In summary, results from the 2015 outlet survey suggest that scale up of the PPM program could further improve availability and distribution of mRDT and AL among outlets stocking antimalarials. This is particularly important given that, currently, pharmacies play a relatively large role in antimalarial distribution and are primarily distributing chloroquine. Results also show strong readiness in the public sector to test and appropriately treat malaria cases.
3.1 acknowledgements
Acknowledgements
ACTwatch is funded by the Bill and Melinda Gates Foundation, UNITAID, and the UK Department for International Development. This study was implemented by Population Services International (PSI).
WHAT IS ACTWATCH?

ACTwatch is a multi-country research project designed to provide timely, relevant, and high quality antimalarial market evidence. Launched in 2008 with funding from the Bill and Melinda Gates Foundation, it is currently implemented in 13 countries with additional funding from UNITAID and the DFID. Standardized tools and approaches are employed to provide comparable data across countries and over time.

FOR MORE INFORMATION CONTACT:

Dr. Megan Littrell, Principal Investigator
mlittrell@psi.org
1120 19th Street, NW | Suite 600
Washington, DC 20036
psi.org