

## **Assessment of ACT and RDT Management Practices under Implementation of Global Fund Malaria Grants in Laos: June–August 2008**

---

Roxane Bunel  
Melissa Thumm  
Beth Yeager

March 2009



---

Strengthening Pharmaceutical Systems  
Center for Pharmaceutical Management  
Management Sciences for Health  
4301 N. Fairfax Drive, Suite 400  
Arlington, VA 22203 USA  
Phone: 703.524.6575  
Fax: 703.524.7898  
E-mail: [sps@msh.org](mailto:sps@msh.org)

This report is made possible by the generous support of the American people through the U.S. Agency for International Development (USAID), under the terms of cooperative agreement number GHN-A-00-07-00002-00. The contents are the responsibility of Management Sciences for Health and do not necessarily reflect the views of USAID or the United States Government.

## **About SPS**

The Strengthening Pharmaceutical Systems (SPS) Program strives to build capacity within developing countries to effectively manage all aspects of pharmaceutical systems and services. SPS focuses on improving governance in the pharmaceutical sector, strengthening pharmaceutical management systems and financing mechanisms, containing antimicrobial resistance, and enhancing access to and appropriate use of medicines.

## **Recommended Citation**

This report may be reproduced if credit is given to SPS. Please use the following citation.

Bunel, R., B. Yeager, and M. Thumm. 2009. *Assessment of ACT and RDT Management Practices Under Implementation of Global Fund Malaria Grants in Laos: June–August 2008*. Submitted to the U.S. Agency for International Development by the Strengthening Pharmaceutical Systems (SPS) Program. Arlington, VA: Management Sciences for Health.

Strengthening Pharmaceutical Systems  
Center for Pharmaceutical Management  
Management Sciences for Health  
4301 North Fairfax Drive, Suite 400  
Arlington, VA 22203 USA  
Telephone: 703.524.6575  
Fax: 703.524.7898  
E-mail: [sps@msh.org](mailto:sps@msh.org)  
Web: [www.msh.org/sps](http://www.msh.org/sps)

## CONTENTS

Acronyms.....	iv
Acknowledgments.....	v
Introduction.....	1
Assessment Objectives.....	1
Malaria Situation.....	3
National Treatment Policy .....	3
National Malaria Control Program.....	4
Global Fund Malaria Grants .....	4
Pharmaceutical Management Framework.....	5
Methodology .....	6
Methods.....	6
Results.....	9
Structure and Design of the Supply System.....	9
Availability.....	10
Procurement and Quantification .....	12
Distribution .....	12
Storage Conditions .....	14
Provincial and District Levels.....	15
Health Centers and Villages.....	15
Inventory Management .....	15
Information System and Record Keeping.....	16
Supervision/Monitoring .....	18
Human Resource Capacity in Pharmaceutical Management .....	18
Recommendations.....	20
Define the Supply Chain Management System at all Levels.....	20
Improve Quantification of Requirements at all Levels.....	20
Store Medicines at the Provincial or Regional Level and Improve Distribution to DAMS ....	20
Develop SOPs/Guidelines for Inventory Control .....	21
Develop SOPs/Guidelines for Disposal of Expired Medicines.....	21
Combine Reporting on Morbidity and Stock Levels and Simplify Process for VHVs .....	21
Improve Monitoring/Supervision.....	21
Improve Capacity in Pharmaceutical Management of Personnel at all Levels.....	22
Annex 1. Questionnaire for Provincial Antimalaria Station.....	23
Annex 2. Questionnaire for District Antimalaria Station .....	30

## ACRONYMS

A+L	artemether + lumefantrine
ACT	artemisinin-based combination therapy
CMPE	Center for Malaria, Parasitology and Entomology
DAMS	district antimalaria station
GFATM	Global Fund to Fight AIDS, Tuberculosis and Malaria
Lao PDR	Lao People's Democratic Republic
LLIN	long-lasting insecticidal net
LMIS	Logistics management information system
MCSP	Medical Products Supply Center
MIS	management information systems
MoH	Ministry of Health
MPSC	Medical Products Supply Center
MSH	Management Sciences for Health
PAMS	provincial antimalaria station
PR	Principal Recipient
PU	Procurement Unit
PSM	Procurement and Supply Management
RDT	rapid diagnostic test
RPM Plus	Rational Pharmaceutical Management Plus program
SOP	standard operating procedure
SPS	Strengthening Pharmaceutical Systems program
VHV	village health volunteers
WHO	World Health Organization

## **ACKNOWLEDGMENTS**

SPS would like to thank WHO/Laos, the office of the principal recipient for the Global Fund to Fight AIDS, Tuberculosis and Malaria in Lao People's Democratic Republic,(PDR) and the Center for Malariology, Parasitology and Entomology of Lao PDR for their cooperation and support in preparing for and conducting this assessment. In particular, SPS would like to acknowledge Dr. Deyer Gopinath, Dr. Rattanaxay Phetsouvanh, Mr. Viengsavan Sourinphoumy, Mr. Khamseng Bannaratah, Mrs. Bouvasnsy Hatlhakone, and all the staff at the sites visited during the assessment for their time and support.



## INTRODUCTION

Laos has been awarded Global Fund to Fight AIDS, Tuberculosis and Malaria (GFATM) grants for malaria under Rounds 1, 4, 6, and 7. Under the recently approved Round 7 proposal, the goals of the malaria component are to reduce malaria morbidity and mortality by 80 percent by 2012 (compared with baseline data from 2006), to treat 90 percent of uncomplicated *Plasmodium falciparum* confirmed cases adequately with artemisinin-based combination therapy (ACT) and to maintain 80 percent or more coverage of protection from malaria for the population at-risk through distribution and use of insecticide-treated nets (ITNs)/long-lasting insecticidal nets (LLINs). The proposal also refers to four specific objectives for the malaria component, two of which are closely linked to appropriate pharmaceutical management: “to improve access to early diagnosis and appropriate treatment for population at risk” and “to strengthen the management of the National Malaria Control Program at all levels.”

In January 2008, the GFATM Procurement Unit from Geneva visited Laos to monitor implementation of the Procurement and Supply Management (PSM) plan. Several issues that needed to be addressed were identified, such as improvement of storage conditions at the district and health center levels, implementation of an appropriate pharmaceutical management information system, and improved quantification. The GFATM asked that these issues be addressed for successful implementation of Round 7, and has included improvements in these areas in the conditions precedent to disbursement of funds. Based on the results of the January visit, the Office of the Principal Recipient (the Ministry of Health) and the World Health Organization (WHO)/Laos requested assistance from the Rational Pharmaceutical Management (RPM) Plus program of Management Sciences for Health (MSH), the predecessor to the Strengthening Pharmaceutical Systems (SPS) program.

In April 2008, SPS visited Laos and met with representatives of the Principal Recipient (PR) office, the Center of Malariology, Parasitology and Entomology (CMPE), and WHO/Laos to discuss the scope of the proposed technical assistance. Based on the information obtained during the visit, SPS proposed three activities: (1) immediate assistance in forecasting of medicines and rapid diagnostic tests (RDTs) in preparation for a pending procurement; (2) a rapid assessment of pharmaceutical management practices at the health centers (HCs) and among village health volunteers (VHVs) providing malaria diagnosis and treatment, specifically focusing on inventory management and reporting of consumption data; and (3) based on the recommendations resulting from the assessment, technical assistance in developing strategies to improve pharmaceutical management practices. The present report describes the results of the assessment of pharmaceutical management practices, primarily at the HC and VHV levels, and makes recommendations for improving them.

### Assessment Objectives

- Describe the current pharmaceutical management practices—specifically, distribution, storage, inventory management and reporting on stock levels—used to supply the

GFATM-supported HCs and VHVs with antimalarial medicines, RDTs, and supplies in selected provinces

- Identify the factors that may contribute to current practices
- Provide recommendations for improving management of antimalarial medicines and RDTs, specifically at HCs and among VHVs

## BACKGROUND

### Malaria Situation

While malaria continues to represent a significant public health problem in Laos, morbidity and mortality patterns have changed over the past decade. The number of confirmed cases has decreased from approximately 40,000 cases in 2000 to less than half that in 2007. In 2007, the incidence of confirmed cases reported by CMPE was 3.3 per 1,000 and the mortality had decreased to 0.2 deaths per 100,000. Similarly, the annual parasite index has reportedly dropped to 3.1 per 1,000. However, these improvements are not distributed uniformly throughout the country. Morbidity has dropped drastically in the northern provinces of the country while in the south, morbidity has actually increased over the past few years.<sup>1,2</sup>

CMPE has proposed several reasons for these increases in the southern provinces. One of the most obvious is that morbidity has appeared to increase because of improved reporting from peripheral sites under implementation of GFATM Round 1 and 4 grants. In addition, CMPE suggests that large development projects, such as hydroelectric dam construction and plantation growth, which are causing extensive land clearing and the consequent movement of populations from endemic to non-endemic areas, may be causing an increase in morbidity and mortality rates. The influx of foreign workers brought in to work on these projects may also increase the risk of introducing drug-resistant strains of *P. falciparum*, a growing concern in the region.

### National Treatment Policy

In 2004, Laos adopted an artemisinin-based combination therapy (ACT) artemether-lumefantrine (A+L) (Coartem<sup>®</sup>), as the first-line treatment for uncomplicated *P. falciparum* malaria. Scale-up of the new policy began in three pilot provinces in 2004 and extended to all provinces in 2005. Table 1 shows the three-day treatment regimen.

**Table 1. First-line Treatment of Uncomplicated Malaria**

Age/Weight	Day 1	Day 2	Day 3
6 months–5 years (5–15 kg)	1 tablet in morning 1 tablet at night	1 tablet in morning 1 tablet at night	1 tablet in morning 1 tablet at night
6–11 years (15–25 kg)	2 tablets in morning 2 tablets at night	2 tablets in morning 2 tablets at night	2 tablets in morning 2 tablets at night
12–14 years (25–35 kg)	3 tablets in morning 3 tablets at night	3 tablets in morning 3 tablets at night	3 tablets in morning 3 tablets at night
≥15 years (≥ 35 kg)	4 tablets in morning 4 tablets at night	4 tablets in morning 4 tablets at night	4 tablets in morning 4 tablets at night

<sup>1</sup> The Global Fund to Fight AIDS, Tuberculosis and Malaria. 2007. *Round 7 Grant Proposal for Tuberculosis and Malaria submitted by Lao PDR*. [http://www.theglobalfund.org/grantdocuments/7LAOM\\_1531\\_0\\_full.pdf](http://www.theglobalfund.org/grantdocuments/7LAOM_1531_0_full.pdf)

<sup>2</sup> World Health Organization Country Program for Thailand. 2008. *Malaria in the Greater Mekong Sub-Region: Regional and Country Profiles, 2008*. [http://www.whothailand.org/LinkFiles/Mekong\\_Malaria\\_Programme\\_MMP\\_Profile2008.pdf](http://www.whothailand.org/LinkFiles/Mekong_Malaria_Programme_MMP_Profile2008.pdf)

*Assessment of ACT and RDT Management Practices Under Implementation of  
Global Fund Malaria Grants in Laos: June – August 2008*

---

Age/Weight	Day 1	Day 2	Day 3
Children < 6 mos.	Artesunate suppository		
Pregnant women	Quinine or artesunate from 2nd trimester for 7 days		

---

For cases of severe malaria, artesunate is administered intravenously, followed by a standard treatment with oral A+L. Second-line treatment for *P. falciparum* malaria is a seven-day course of oral quinine and doxycycline.

As a matter of policy, treatment for *P. falciparum* malaria should be provided only for cases that have been biologically diagnosed by RDT or microscopy. RDTs have been widely distributed to HCs and VHVs under the GFATM grants to diagnose *P. falciparum* malaria. Microscopes are available at the district and provincial level facilities. The national malaria control program has acknowledged, though not documented, some exceptions under which a clinical diagnosis can be made. Cases of *P. falciparum* that have been biologically diagnosed, or are treated with A+L, while suspected but unconfirmed cases, including those with a negative RDT, and cases of *P. vivax* malaria are treated with chloroquine for three days.

### **National Malaria Control Program**

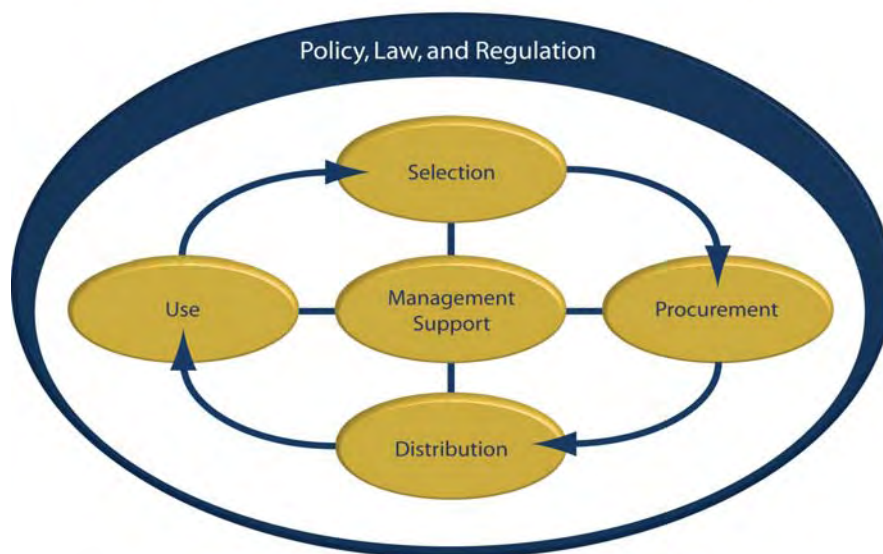
The CMPE in the Department of Prevention and Hygiene in the Ministry of Health (MoH) of Laos coordinates all malaria control activities. In each of the country's 16 provinces, there is a provincial antimalaria station (PAMS) that coordinates malaria activities in the province and reports back to CMPE. Similarly, for each district within a province, there is a district antimalaria station (DAMS) that manages activities at the district level and reports back to the PAMS. At the sub-district level, the program delivers diagnostic and treatment services through HCs and VHVs in over 6,500 villages throughout the country.

### **Global Fund Malaria Grants**

The MoH received funding for malaria activities from the GFATM under Rounds 1, 4, 6, and 7. The main objectives of both the Round 1 and Round 4 grants were to improve access to and availability of early diagnosis and treatment, and to improve prevention through the use of impregnated bed nets. The Round 6 grant focused on strengthening quality control of antimalarials, both in the public and private sectors. The Round 7 grant, awarded in 2008 with CMPE as sub-recipient, is focused on sustaining advances made under the previous rounds. Specifically, the four objectives outlined in the grant are: (1) improve access to early diagnosis and treatment; (2) improve malaria prevention practices; (3) implement village-level information, education, and communication activities; and 4) strengthen management of the malaria control program at all levels. In total, GFATM has approved over 35,000,000 U.S. dollars for malaria treatment and prevention in Laos.

## Pharmaceutical Management Framework

The framework used to organize the data collection and the report on findings and recommendations is the pharmaceutical management cycle (figure 1). Managing pharmaceuticals in any setting (public or private sector) and at any level (local, provincial, or national) follows a cycle of selection, procurement, distribution, and use. The functions of management support—including the pharmaceutical management information system and monitoring and evaluation—hold the cycle together. The cycle is supported by policies, laws, and regulations.



Source: Management Sciences for Health

**Figure 1. Pharmaceutical Management Cycle**

Based on discussions with CMPE, the PR Office, and WHO/Laos about the areas to be addressed in this assessment, the main focus was on pharmaceutical management of the ACTs and RDTs procured and distributed under the GFATM grants. Although particular attention was paid to the lower levels of the system, namely health centers and villages, an understanding of how the system works as a whole, at all levels, was essential. The key components of the cycle focused on during data collection include—

- Policies and guidelines—the availability of SOPs and standardized forms
- Procedures for forecasting needs
- Distribution—procedures for quantifying needs and requisitioning at the local level and for receiving, storing, and issuing medicines and supplies, including record keeping and inventory control methods
- Pharmaceutical management information system  
Program management—monitoring and supervising programs, and managing human resource

## METHODOLOGY

### Methods

All activities related to the assessment were carried out in close coordination with CMPE, the PR Office, and WHO/Laos.

The methodology used for this assessment was an adaptation of the Pharmaceutical Management for Malaria assessment methodology developed by MSH.<sup>3</sup> A combination of the following methods were used to collect data on the current pharmaceutical management practices—distribution, storage, inventory management, and consumption—used to supply the GFATM-supported health centers and village health volunteers with malarial medicines and supplies.

### *Document Review*

Since a wealth of information on GFATM implementation of malaria prevention and treatment activities exists, and to avoid duplication of efforts, documents that provided relevant background on existing pharmaceutical management systems for malaria were reviewed before data collection began. Some examples of the types of documents reviewed included—

- GFATM proposals and related documentation
- Manual(s) for GFATM procurements
- Regulations, standard operating procedures (SOPs), and other documents that describe the storage, distribution, and reporting procedures for malaria medicines and RDTs
- Reports and publications on pharmaceutical management issues produced by other (non-MoH) organizations
- Distribution plans for ACTs and RDTs for Rounds 1 and 4
- National morbidity data

### *Interviews with Health Personnel*

The assessment team conducted semi-structured interviews with personnel at all levels of the system at 38 facilities.

A data collection form was developed for the site visits that included questions to ask and observations to be made by the data collection team. The questionnaires were written in English, translated into Lao, and then back-translated into English to confirm correct translation. (See examples of PAMS and DAMS questionnaires in Annexes 1 and 2.)

---

<sup>3</sup> Rational Pharmaceutical Management Plus Program. 2004. *Pharmaceutical Management for Malaria Manual*. Submitted to the U.S. Agency for International Development by the Rational Pharmaceutical Management Plus program. Arlington VA: Management Sciences for Health.

### Record Review

At each site, relevant documentation such as stock records, request/issue forms, patient forms, and morbidity reports were reviewed. The records and forms were discussed with health personnel to get a better sense of how the records, forms, and reports were being used.

### Direct Observation

Information on storage conditions and inventory management practices was collected through direct observation. At each site visited, the assessment team discussed the findings with personnel in an effort to determine the factors contributing to or hindering good pharmaceutical practices at each level.

### Sampling

As agreed with CMPE and the PR, data were collected from three provinces: one in the north where malaria morbidity is relatively low (Oudomxay—400 cases reported in 2007), one in the central region of the country with medium morbidity (Khammouane—1,496 cases reported in 2007) and a third in the south where malaria morbidity is highest (Attapeu—4,158 cases reported in 2007).

The site visits were conducted in July 2008. The assessment team consisted of a local consultant hired by MSH to lead the data collection, an independent Lao interviewer, and an interpreter. Two representatives of the PR office and one CMPE staff member also accompanied the team on the visits (table 2).

**Table 2. Sites Visited**

Province	Provincial level	District Level	Health Centers	Villages
Oudomxay	PAMS	DAMS Beng	Nang Oua Napa	Ha Meun Nam Meth Houay Hok
		DAMS Xay	Phon Hom	Sanamapri Piengsay
Khammouane	PAMS	DAMS Xebanfay District hospital	Ban Sang	Ban Nabeung Ban Som Ban Nakomtong
	Thakek Provincial Hospital	DAMS Nyommalat District hospital	Ban Hai Xiengdao	Ban Hai Ban Natin Ban Khambai
Attapeu	PAMS	DAMS Phouvong	Phou Hom	Taoum Phouxay Vongvilaytay
		DAMS Xamakhisay	Koumkam	Mixay Ban Sork Ban Phoukham Meunhouamouang Bankoghang

For each province, two districts were selected. An effort was made to select one identified as “poor” by the Lao PDR National Statistics Service and another identified as “not poor.” In addition, some consideration was given in favor of areas with transitional or displaced populations.

The assessment team attempted to visit one of each type of facility receiving and dispensing ACTs and RDTs in the provinces. In all three provinces, the PAMS and two DAMS were visited. Unfortunately, due to time constraints and the unavailability of personnel at the time of the site visits, provincial and district hospitals could only be visited in Khammouane. In each district of the three provinces, the team visited at least two health centers, and for each health center, the team interviewed village health volunteers from at least two villages. The team worked with personnel at the district level to select the health centers and villages to visit. Personnel from the DAMS requested that priority be given to health centers that have not been supervised recently by district personnel.

### ***Data Processing and Analysis***

All of the data and information collected during the site visits were systematically compiled, reviewed, and analyzed. Because of the small sample sizes used in the analysis, most of the findings are not presented as percentages. After an initial review of the information, CMPE and PR office staff were consulted on some remaining questions.

### ***Limitations***

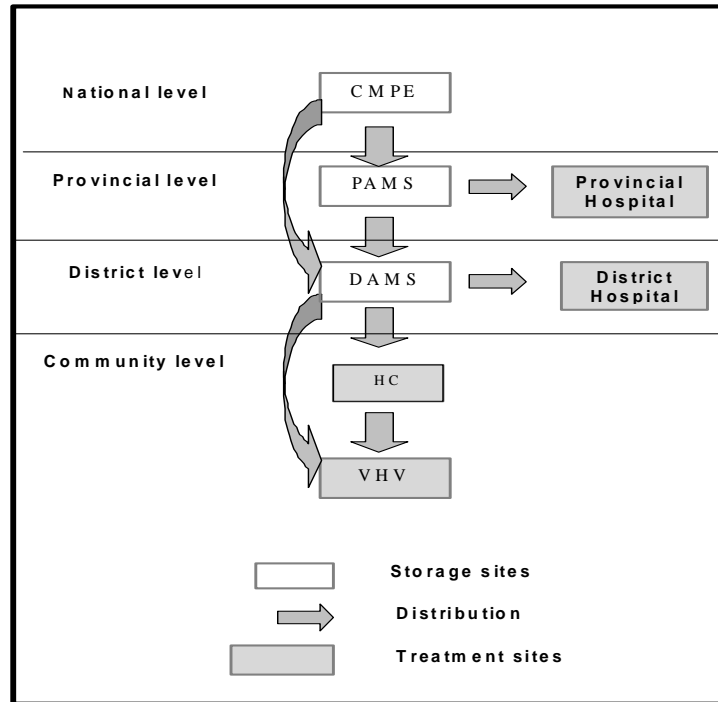
Because of the relatively small sample used in this type of assessment, the findings are not necessarily generalizable to other areas of the country. A second limitation of the assessment is that because of time constraints and poor accessibility in the rainy season, only VHV's accessible by car were visited. Furthermore, since the VHV were not told of the team's visit beforehand, some were not present when the team arrived. In some cases, replacements were selected; in other cases, this was not possible.

Finally, informant bias may also limit the accuracy of the findings. Working with translators further complicated this issue. In some cases, even the Lao translators had difficulty communicating with the health personnel interviewed due to language differences

## RESULTS

### Structure and Design of the Supply System

The supply system for malaria medicines and RDTs is shown in Figure 2.



**Figure 2. Supply system for malaria medicines and RDTs**

The PR Office Procurement Unit procures the medicines and supplies, according to a forecast provided by CMPE. CMPE has an agreement with the Medical Products Supply Center (MPSC) of the Food and Drug Department of the Ministry of Health to receive and store the malaria medicines and supplies in their warehouse in Vientiane when they arrive in country. CMPE waits until all medicines and supplies are delivered to MPSC, and then initiates distribution to the provinces. CMPE contracts with a private transportation firm to distribute the medicines. The distribution plan is prepared by CMPE.

The straight, vertical arrows in figure 2 indicate the vertical path of medicines and supplies that has been followed in the past. The PAMS receive stock from CMPE, which includes reserve stock to be kept at the PAMS, stock to be used by the provincial hospital, and stock to be sent to the DAMS. The DAMS then receive stock from the PAMS, which is sent to the health centers in the district and to the district hospital. Finally, the health centers receive medicines and supplies for use at their facilities as well as stock to be distributed to the VHV.

The two curved arrows shown in figure 2 illustrate an alternative distribution strategy currently in practice. At the time of the assessment, some DAMS were receiving stock directly from

CMPE in an attempt to get the medicines and supplies to their final destination more quickly. Likewise, in some cases DAMS have found that because of jurisdiction boundaries, it is easier to get stock directly to villages, instead of channeling them through the corresponding health center.

The design of the supply system was described by informants at all levels and was summarized in some documents presented to the GFATM (i.e., Proposal for Round 7 and PSM plan); however, at the time of the assessment, documentation of the system in the format of SOPs or guidelines was not available. The Procurement Unit of the PR office was working on the Logistics Management Information System (LMIS), which will reportedly contain a description of supply system procedures and the corresponding forms and report templates.

## Availability

The availability of first-line treatment for *P. falciparum* malaria and RDTs at both the storage and treatment sites visited for the assessment was used as an indicator of the supply system's performance. A summary of the number of blister packs of A+L and the number of RDTs in stock at each site visited is presented in table 4. Since the site visits were conducted in July 2008, only stock with an expiry date of August 2008 or later was counted as "available."

**Table 4. A+L and RDTs Available at Time of Site Visit**

	Coartem				RDTs
	1x6	2x6	3x6	4x6	
PAMS OUDOMXAY	1,290	420	90	420	14,300
DAMS BENG	220	209	149	178	2,012
HC <sup>a</sup> NangOua	15	12	19	12	257
VHV <sup>b</sup> HaMeun	10	8	7	8	100
VHV HouayHot	10	8	7	8	100
DAMS XAY	340	265	71	235	3,875
HC PhonHom	15	10	10	14	143
VHV Sanampri	0	0	0	0	17
VHV Piengsaï	4	3	2	4	14
PAMS ATTAPEU	0	0	37	45	15,275
DAMS PHOUVONG	0	0	29	30	6725
HC PhouHom	0	0	30	20	100
VHV Taoum	0	0	20	18	49
VHV Phouxay	0	0	19	5	106
VHV Vongvilaytay	0	0	19	15	59
DAMS XAMAKHISAY	0	0	75	75	2,500
HC Koumkham	0	0	25	0	139
VHV Mixay	0	0	15	9	171
VHV Bansork	0	0	17	19	174
HC Benphoukham	0	0	7	4	19
VHV Meunhouamouang	0	0	19	10	156
PAMS KHAMMOUANE	0	0	0	0	0
Provincial hospital	0	0	0	0	0

*Results*

	Coartem				RDTs
	1x6	2x6	3x6	4x6	
DAMS XEBANFAY	0	0	0	0	0
District hospital	0	0	0	0	0
HC Bansang	0	0	0	0	11
VHV Bannabeung	0	0	0	0	0
VHV Bansom	0	0	0	0	10
VHV Bannakomtong	0	0	0	0	8
DAMS NYOMMALAT	0	0	0	0	0
District hospital	0	0	0	0	0
HC BanHaï	0	0	0	0	20
VHV BanHaï	0	0	0	6	14
HC Xiengdao	0	0	0	0	0
VHV Ban natin	0	0	0	0	0
VHV Bankhamhaï	0	0	0	0	0

*Note:* Counts from HC Napa and Village Nam Meth were incomplete and are not presented here.

<sup>a</sup> HC = health center

<sup>b</sup>VHV = village health volunteers

Of the 36 sites visited, 20 (55 percent) had A+L in at least one of the blister pack types available. Approximately three quarters (78 percent) had no 1x6 blister packs on hand; 78 percent had no 2x6 blister packs; 42 percent had no 3x6 blister packs; and 47 percent had no 4x6 blister packs. None of the sites visited in Khammouane province had A+L with an expiration date of August 2008 or later in stock.

With respect to RDTs, 72 percent of the sites visited had RDTs in stock. While 100 percent of the sites visited in both Oudomxay and Attapeu had RDTs, only 33 percent of the sites in Khammouane had them.

Provincial staff in both Attapeu and Khammouane said attempts had been made to address the stock-outs. The assessment team was told that PAMS personnel in Khammouane had communicated to CMPE that the province was out of A+L, but no action had yet been taken. In Attapeu, earlier in the year provincial staff redistributed the A+L available within the province.

Table 3 shows that of the three provinces visited, only PAMS Oudomxay had significant reserve stocks available. It should be noted that this is also the province with the lowest reported morbidity for 2007. According to the morbidity data from 2007, only 367 cases of malaria were reported in the province. At the time of the visit, the reserve stock of A+L on-hand at PAMS Oudomxay—taking into account all dosages combined and only considering products expiring after August 2008—was 2,227 blister packs, enough for treatment of six times as many cases as the annual number of cases reported in the province in 2007.

## **Procurement and Quantification**

While a review of the procurement process and related documentation was beyond the scope of the current assessment, some basic information is presented as it relates to other pharmaceutical management practices.

A+L, intravenous artesunate, artesunate suppositories, and RDTs are procured under GFATM grants. The PR Office Procurement Unit places an order for malaria medicines, RDTs, and bed nets once a year for the whole country. The time between when an order is placed and when the products arrive in country has usually been around six months. Orders have typically been placed in June or July; supplies have arrived at the end of the year, and are distributed to the villages by March of the following year. The challenges to distribution are described in the following section.

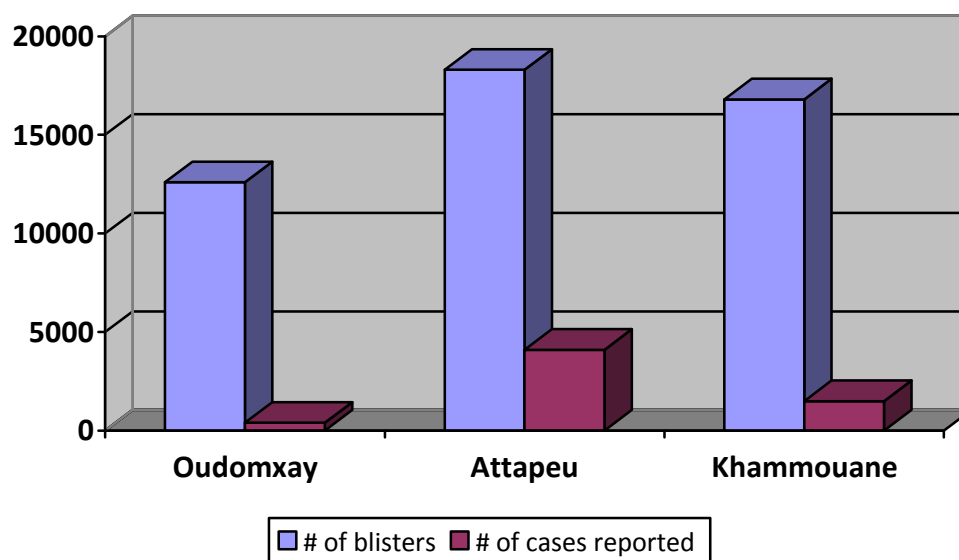
The amount to be procured is based on an estimation of needed quantities prepared at the central level by CMPE, with the assistance of WHO/Laos. To date, quantification exercises have been based on available morbidity data (reported cases from the provinces, adjusted for reporting rates) from the past year. Some consideration has been given to anticipated changes in the number of cases of malaria in some provinces and the need for a buffer stock at the PAMS and DAMS; however, the calculations have not taken into account existing stock levels or consumption.

## **Distribution**

CMPE contracts with a private transportation firm to deliver medicines and supplies to the PAMS and, as mentioned above, in some cases, directly to the DAMS. The last delivery of medicines and supplies from CMPE to each of the provinces was as follows: Oudomxay in March 2008; Attapeu in March 2008 (although not all districts received medicines); and, Khammouane in May 2007. It was not clear why Khammouane had not received a new delivery in March 2008 at the same time as the other provinces.

The distribution plan for the PAMS and DAMS is prepared by CMPE staff at the central level. Staff at CMPE reportedly based the distribution plans on the quantification worksheets CMPE prepared and submitted to the GFATM Procurement Unit. In developing the distribution plan, no consideration seems to have been given to existing stock levels at storage or treatment facilities.

In reviewing the distribution plans used for 2008 and comparing with morbidity data from the previous year, which had reportedly been used in the quantification exercise, some inconsistencies were noted. For example, the graph below shows the extent to which the number of full courses of A+L sent to each of the three provinces visited exceeded the number of cases of malaria from the same provinces.



**Figure 3. Number of blister packs of A+L distributed in 2008 compared With number of cases reported in 2007**

As figure 3 shows, Oudomxay received enough A+L to treat over 30 times more cases than the number reported in 2007, while Attapeu and Khammouane received enough for over 4 and 11 times more, respectively. While it is general practice to include an additional percentage of medicines or supplies to compensate for losses and unexpected increases in demand, the number of blister packs allocated in the distribution plan far exceeds any reasonable adjustment to estimated needs.

According to the distribution plans the central level developed for each of the provinces, each district receives the same quantity. The total number of medicines received at the province, minus the buffer stock held at PAMS, is divided equally among the districts. Neither the number of cases reported in each district nor levels of existing stock in each district are taken into consideration. The example of Attapeu is presented in table 3. Most notably, Xaysettha and Xanxay districts received the same number of blister packs even though Xaysettha reported nearly three times as many cases as Xanxay.

**Table 3. Number of Blister Packs to be Distributed to Districts in Attapeu According to Distribution Plan for 2008 Versus the Number of Cases Reported in 2007**

	Number of blister packs	Number of reported cases
Samakhixay district	2,400	699
Xaysettha district	2,400	1,340
Sanamxay district	2,400	953
Xanxay district	2,400	463
Phouvong district	2,400	585

If the PAMS receive the medicines for the district, the district is responsible for picking them up. As mentioned above, in some cases, CMPE now arranges for medicines and supplies to be delivered directly to the DAMS.

The DAMS are responsible for developing a distribution plan and managing the deliveries to the health centers in their jurisdiction. No documentation describing how to prepare the distribution plan was found, neither were guidelines or SOPs documenting the distribution process at any level of the system. The health centers receive stock for their own needs and may receive additional stock to be given to the villages that are under their responsibility. In some cases, as mentioned above, the DAMS distribute directly to the VHVs without passing through the health centers. This is the case for villages that are located geographically closer to the DAMS than their corresponding health center.

In the districts visited, the same quantity of medicines and supplies was distributed to each of the health centers and villages, regardless of population, morbidity, or consumption.

The distribution of medicines and supplies to the HC or VHV may take several months to complete after they are received by the district. In some cases, the DAMS make the delivery to the HC and villages, in others the HCs or VHVs are expected to go to the DAMS to collect the supplies. This seems to depend on the DAMS; differences were found among and within provinces. Sometimes HC personnel will take advantage of a non-malaria related meeting—a supervisory visit or simply a personal visit to the town in which the DAMS is located—to pick up medicines and supplies.

In many cases, distribution depends on the availability of funds for transportation. Some VHVs, for example, reported having to “save up” money for gasoline to get to the DAMs for their supplies. Some reported having waited several months to pick up supplies after receiving notification that they were available in the DAMs. No specific funds for transportation beyond the district level were allocated under the current rounds of GFATM.

## **Storage Conditions**

At the central level, antimalarial medicines and supplies are stored at the MPSC. This facility was recently constructed with the support of the Japan International Cooperation Agency. The storage conditions are excellent. The warehouse is ample in size, products are stored on shelving, and temperature and humidity are controlled. However, at all other levels of the system, the conditions in the locations designated for storage of malaria medicines and supplies were found to be inadequate. At the time of the assessment, the procurement unit of the PR office had undertaken a survey of storage conditions and was in the process of developing strategies for improvements. For this reason, a more thorough analysis of storage conditions was not included as part of this assessment.

## **Provincial and District Levels**

All the PAMS and DAMS visited had an area designated for the storage of medicines and supplies, but storage conditions varied from site to site. In some cases, the stock was in a small room used exclusively for storage; in others, medicines were kept in the same large room that served as office space.

In all cases, minimum criteria for good storage were not met. No thermometers or records of temperature levels were observed. Humidity was not controlled and there was poor ventilation, either due to the absence of windows or fans or both. SOPs or guidelines on good storage practices had not been provided to staff.

## **Health Centers and Villages**

In both the HCs and the villages, storage conditions were poor. In some cases, the HC had been given a cabinet by another project (e.g., World Bank, Asian Development Bank), where all the medicines and supplies for the health center were kept, including those for malaria. Some VHV's also had been given cabinets, but a few of those visited did not have one and stored their supplies in cardboard or plastic boxes kept on the floor.

Temperature, humidity, ventilation, and exposure to light were not controlled. The personnel of the health centers and the village health volunteers interviewed said they had not received instructions on how to store the medicines.

## **Inventory Management**

As stated above, the supply system is a vertical “push” system, meaning the higher levels decide the quantities to send to the lower levels, which depends on medicines and supplies being distributed once a year. Based on interviews conducted at the time of the assessment, personnel at all levels were unfamiliar with the procedure for requesting more medicines from an upper level if their stock needed to be replenished. Basic inventory management practices, such as setting minimum and maximum stock levels to help prevent stock-outs or overstocks, were not implemented.

At the PAMS and DAMS visited for the assessment, particularly in Oudomxay and Attapeu, where medicines and supplies were in stock, there were no stock cards identifying or monitoring the products. Furthermore, expired and soon-to-expire stocks were not separated from unexpired stock.

Expired products and products due to expire the following month were seen at many of the sites. Many factors seem to have contributed to the presence of expired products, including an overestimation of need in forecasting and the prolonged distribution time to get products from Vientiane to the villages, particularly given the short shelf-life of A+L. The fact that there are no

standardized and documented procedures and forms for re-ordering or re-distributing stock, within a province or between provinces, also exacerbates this issue.

CMPE had issued an order to the PAMS shortly before the site visits began to collect all expired products. At the time of the site visits the PAMS were attempting to collect them. However, they had not been provided instructions on what to do with these products once they had collected them. No national SOPs on the destruction of expired products were available. At the time of the assessment, the PR Office Procurement Unit was looking into options for disposal of these products.

### **Information System and Record Keeping**

At the time of the site visits, CMPE had just begun to implement new reporting forms for stock levels. Previously, little or no data on consumption or stock levels was reported back to CMPE. This was a major weakness in the system that contributed to inadequate forecasting and, ultimately, to stock-outs and overstocks throughout the system

The forms for reporting on stock levels are part of the LMIS that the Procurement Unit has been developing for medicines and supplies procured under the GFATM grants. The new system calls for quarterly reporting on consumption and stock levels. The DAMS are in charge of collecting and consolidating the information from the villages in their district. The PAMSs are then in charge of collecting and consolidating information from the districts in their respective province.

CMPE's training of PAMS's and DAMS's staff on this new material for record keeping and reporting was conducted several months before the assessment, according to informants, but the distribution of documents/forms had just begun, so not all provinces had received them. For example, none of the sites in Attapeu had received the forms yet at the time of the site visits. Additionally, the forms for the HCs and VHVs were still under revision at the central level.

At the PAMSs and DAMSs that had not received the new forms, the only stock records were receipt vouchers and distribution plans. Since personnel were told to keep a separate accounting of medicines and supplies from different rounds, and years within the rounds, the information was contained in different folders. One would have had to piece together the information to get a sense of total stock movement.

At the PAMSs and the DAMSs that had received the new forms, the stock records (called the "ID Card" in the LMIS) were not always filled in completely. The expiry date and lot number were rarely recorded.

Visits to most of the HCs and villages visited revealed that the only record on stock was the receipt voucher sent when the medicines were delivered. Personnel did not keep information on current stock levels. Moreover, in some cases, the HC kept a copy of the receipt voucher for the village, and the VHVs did not have any record of stock in their possession.

In every health center and village visited, when the assessment team asked to see records on stock movement, they were shown the receipt vouchers and the morbidity forms that have been recently developed and distributed by CMPE, as these forms also include information on treatment dispensed to patients. While a thorough review of these forms was beyond the scope of this assessment, an overview of some of the issues encountered with them is presented here as they also contain information on treatment and, more importantly, the morbidity reports serve as the basis for quantification. Furthermore, including treatment information on these forms seems to be generating some confusion about what reporting on stock levels means.

The new morbidity forms developed by CMPE are used to record information on patients presenting with fever at treatment sites. At the time of the visit, the register had not been distributed to all health personnel, but plans to make it available had been made. CMPE staff said that all health personnel had been trained on how to fill out these new forms. The forms for HCs and VHVs are like ledgers. The first page provides a summary of the treatment regimens. The forms contain information on the patient presenting with fever, including age, gender, address, and symptoms. It also contains information on whether an RDT was used, the test result, and the treatment given.

The VHV is supposed to copy his/her morbidity forms for the month and submit the copy to the HC. The HC then consolidates information on patients treated at its own site as well as by the village health volunteers under its supervision and sends this consolidated report to the DAMS, which prepare a consolidated district report and submit this to the PAMS. The PAMS are supposed to record/report data from the provincial hospital and all the districts within the province.

The HC, DAMS, and PAMS have two types of forms for reporting morbidity data: one for non-severe cases of malaria and the other for severe cases. Reporting is meant to occur on a monthly basis. Data should be collected from the VHV between the first and fifth of the month, from the health center between the fifth and fifteenth, from the DAMS between the fifteenth and twenty-fifth, and at the end of the month by the PAMS.

In the sites visited, problems with filling in the records and reporting forms were observed. At the village level, for example, some villages with two VHVs had received only one patient register book. The VHVs were expected to share the register book and send one complete report to the health center every month. In practice, the VHVs in these villages were not sharing the book, but rather recording their own information separately. As a result, the information in the register was incomplete.

Many of the records observed both in HCs and in villages during the site visits were incomplete and contained inconsistencies in the way certain columns were filled out. For example, in some cases the result of the RDT was listed positive in the “RDT only,” and then negative in the “RDT+microscope” column, even when the site did not have microscopy available. Also, personnel did not seem to know what to write in the “other treatment” column. Some wrote the name of the medicine given, some wrote only the number of tablets given, and some simply put a check in the column.

The task of consolidating information, at the health center and at the DAMS, seems to create some problems as well. The reporting forms observed at the HC, DAMS, and PAMS visited on the assessment shows that, in the majority of cases, information submitted to the next higher level did not include information from all of the sites and thus was incomplete. This absence of data from certain sites was not indicated or accounted for in the report, thereby giving the impression that the information was complete. When asked about this, some personnel said they worked under the assumption that if they did not receive a report from a lower level facility, it was because that facility had no cases to report that month. However, on the site visits, the team was able to observe that this was not always the case. In several villages, for example, the assessment team noted cases that had been registered by a VHV in the record, but had not been reported to the HC and therefore included in the health center's consolidated report. Some of the VHVs reported not having had time to submit their report that month.

Some health center personnel said it took them well over half a day to fill out the consolidated report. Some were not clear which VHVs were supposed to report back to them; others simply assumed that certain volunteers were sending their reports directly to the district level.

The submission of reports is complicated for the same reasons distribution of medicines and supplies is difficult. Many villages and health centers are located in remote areas that are largely inaccessible in the rainy season. In addition, the cost of taking the reports to the health center or the DAMS is assumed by the VHV or the HC personnel, who at times do not have the necessary funds to cover the cost of transportation. As was the case with distribution, some informants said they submitted reports to personnel who visited them to conduct supervision for other programs, even if the visits did not correspond with the reporting schedule.

### **Supervision/Monitoring**

The Monitoring and Evaluation Unit of the PR Office has programmed monitoring visits to the provinces on a regular basis to address programmatic and service delivery issues. Pharmaceutical management, however, does not seem to be adequately covered in these visits. There was no checklist or supervisory tool to define stock issues to observe during monitoring visits, such as stock levels or storage conditions. The LMIS in preparation at the time of the assessment is meant to address this shortcoming.

In addition to monitoring visits from the central level, informants at each level reported receiving visits from the level above them with varying periodicity. The frequency of visits depended on the distance between the two sites and funds available for transportation. No checklists or supervisory tools related to stock issues are available for these monitoring visits.

### **Human Resource Capacity in Pharmaceutical Management**

Health personnel at all levels of the system lack a basic understanding of pharmaceutical management practices and their importance in safeguarding the quality of medicines and supplies

in circulation, limiting wastage, and meeting the ultimate goal of ensuring the availability of treatment to those who need it.

Capacity to analyze the volume of morbidity information that currently flows up through the system is limited. This situation will only worsen as the new morbidity registers reach more health centers and villages. Also, as the LMIS is rolled out, additional information on stock levels and consumption will be available and will need to be analyzed in conjunction with the morbidity data, particularly for the purpose of quantification. The capacity for this type of analysis is currently unavailable, and the quantification exercise has required external assistance.

In addition, personnel do not seem to critically analyze the information they receive and consolidate. One example of this was found in Khammouane. When the assessment team looked at the monthly morbidity report the PAMS had received from the provincial hospital, the number of RDTs reported for that month seemed extremely high. The PAMS had simply included the data in their report to CMPE. The assessment team followed up with the person in charge of recording these data and found that he had been recording the total number of all analyses conducted in the hospital for the month.

As stated in the previous section, there are no monitoring tools to address pharmaceutical management issues. In addition, the personnel currently in charge of conducting these monitoring visits do not have the capacity to assess the situation and resolve any problems encountered.

## **RECOMMENDATIONS**

### **Define the Supply Chain Management System at all Levels**

SOPs or guidelines that clearly define the responsibilities of each level of the supply system should be developed and implemented. These SOPs or guidelines would establish the minimum standards to be followed during quantification, ordering, storage, inventory control and distribution of medicines. All stakeholders—CMPE, the PR office, and provincial and district staff—need to be involved in developing and implementing the same SOPs. At the time of the assessment, the procurement unit and CMPE were developing the LMIS, which should provide a good starting point for developing the SOPs.

### **Improve Quantification of Requirements at all Levels**

CMPE should combine existing morbidity-based methods (based on reported morbidity data) and past consumption-based methods (based on reported consumption data) to determine the quantities of medicines to order for the country. The same information can then be used to determine the quantities to be sent to lower levels in the supply chain.

SOPs for quantification should also be developed. They would include a standard formula for calculating the quantities to distribute. Minimum and maximum stock levels need to be defined based on the local malaria situation. Calculations need to be based on the number of expected cases, existing stock levels, safety stock levels and other pertinent information, such as the season. Training for health personnel on quantification methods is essential. Through proper quantification, the amount of wasted medicines and supplies due to expiry will be reduced.

### **Store Medicines at the Provincial or Regional Level and Improve Distribution to DAMS**

Because storage conditions at the DAMS are inadequate, not only according to the results of this assessment but also based on other available information, it may prove more cost-effective to distribute supplies more than once per year. Medicines could be stored at the central level or potentially at a provincial warehouse, and then distributed intermittently to the DAMS. Obviously, the rainy season would affect when these deliveries were scheduled.

SOPs for distribution need to be developed. The guidelines should define the distribution chain, the persons responsible at each level, and the frequency of distribution, taking into account seasonal changes in morbidity, geographical access of health centers, pre-determined minimum stock levels, costs, and limitations to transportation during the rainy season. Also important to include in these SOPs is how to redistribute medicines and supplies within or between provinces based on needs—this can help to minimize expiry of medicines.

### **Develop SOPs/Guidelines for Inventory Control**

The guidelines for inventory control lay out the responsibilities and procedures for proper storage and inventory control, as well as supervision, at all levels. They should include examples of recording and reporting forms, such as those that have recently been developed. It is important that the forms are as simple to use as possible. Given the limited capacity of some personnel, particularly at the village level, every effort should be made to ensure that the forms ask for only the essential information required. Keeping the forms simple will also reduce the chance for confusion or incomplete reporting.

### **Develop SOPs/Guidelines for Disposal of Expired Medicines**

Even though the problem of expired medicines and supplies can be minimized through proper supply chain management, there will always be some products that expire. As such, and especially given the current problem with expired medicines in the system, it is important to develop and implement guidelines for managing expired medicines at each level, including destruction at the higher levels. While some international guidelines on disposal of expired medicines exist, these need to be tailored to the local context and include the specific steps and paperwork that personnel should use to recall and dispose of expired stock.

### **Combine Reporting on Morbidity and Stock Levels and Simplify Process for VHVs**

The frequency of reporting and the person to whom reports should be submitted should be standardized to avoid confusion. For many VHVs, monthly reporting may not be feasible. A more practical timetable for reporting, such as once every quarter, could be agreed upon. When VHVs report on morbidity quarterly to their health centers, they should report on stock levels at the same time.

### **Improve Monitoring/Supervision**

A standardized checklist for monitoring/supervision should be developed. The checklist should include observation of stock levels, review of stock records and comparison with physical count, and observation of storage conditions. Key inventory management indicators on the checklist could include—

Facility/administrative indicators—

- Are SOPs for storage and inventory control being implemented?
- Are SOPs on distribution being followed?
- Is the staff member responsible for storage, inventory control, and distribution of medicines trained on the SOPs?

- Is there a secure/locked store room or medicines cabinet?
- Are key inventory records (stock card, register, and order/consumption reporting form) available and in use?

Indicators for monitoring inventory management practices—

- Are medicines stored on shelves (not on the floor), away from direct sunshine and moisture?
- Is there a thermometer to monitor temperature in the storage area? Is the temperature monitored on a regular basis?
- Is there an inventory record or stock card for every item? Are day-to-day transactions recorded on the card?
- Are all inventory items entered in an inventory register? (A separate page for each item?)
- Are items arranged according to first expiry/first out?
- Are physical counts done and recorded once every month (or per specified period)?
- Is the inventory register updated once every month (or per specified period) in accordance with the physical count?
- Are orders compiled and submitted once every month (or per specified period) immediately after the physical count?

The checklist could be incorporated into a standard supervisory support tool to be used not necessarily by pharmacy supervisors, but by any health team manager/supervisor out in the field. However, non-pharmacy supervisors should be trained in how to use the tool and how to address any issues they identify.

As the SOPs recommended above are developed, monitoring and supervision indicators should be included.

### **Improve Capacity in Pharmaceutical Management of Personnel at all Levels**

Personnel at all levels should be trained in pharmaceutical management for malaria after SOPs for quantification, ordering, storage, inventory control, and distribution have been developed and disseminated. In particular, personnel from the PAMS and DAMS would benefit from training on storage, distribution, and inventory management, including pharmaceutical waste management (disposal of expired medicines). Personnel from health centers and the village health volunteers require training on storage practices and inventory management, as well as record keeping and reporting. This training should be conducted as an on-going process to keep health staff and VHVs refreshed on pharmaceutical management.

## ANNEX 1. QUESTIONNAIRE FOR PROVINCIAL ANTIMALARIA STATION

<b>Province</b>	
<b>Data collector</b>	<b>Phone number</b>
<b>Date of visit</b>	

### I. PROCUREMENT

1. How many times per year do you receive medicines and supplies for malaria? \_\_\_\_\_

*If different answers are given for different supplies, specify:*

a. Coartem	
b. RDTs (paracheck)	
c. Other medicines (artesunate)	
d. Other supplies (bed nets)	

2. When was the last time you received one of these supplies? \_\_\_\_\_



*Please record the response in terms of number of months. For example, if the person says “around pimāi,” estimate how many months ago that was.*

3. How often do you go to the CMS or CMPE? \_\_\_\_\_

4. How many times per month do you go to Vientiane, for any reason?

5. How many times did someone from CMPE come to visit you last year? \_\_\_\_\_

### II. DISTRIBUTION

6. How many DAMS do you send Coartem and RDTs to? \_\_\_\_\_

7. Does someone from the PAMS go to distribute supplies or do the DAMS pick them up?

Distribute \_\_\_\_\_ Pick up \_\_\_\_\_

*If supplies are picked up, go to question 8.*

7a. How do you usually get to the DAMS?

a. Car	
b. Other (specify)	

7b. Do you receive any money for transportation? Yes \_\_\_\_\_ No \_\_\_\_\_

*If yes, how much?* \_\_\_\_\_

8. Do you deliver the same amount of coartem and related supplies to each DAMS?  
Yes \_\_\_\_\_ No \_\_\_\_\_

8a. *If no*, How do you decide how much to send to each DAMS?

9. How many times per year are coartem and supplies either delivered or picked up?

10. Is there a special form or record where you write down information on distribution?

Yes \_\_\_\_\_ No \_\_\_\_\_

11. How long does it usually take from when you receive supplies from the CMS to when the DAMS receive them? \_\_\_\_\_

### **III. STOCK REGISTER**

12. Do you have a place where you record the amount of medicine and supplies you receive?  
Yes \_\_\_\_\_ No \_\_\_\_\_


12a. Was this form provided by the CMPE/MoH? Yes \_\_\_\_\_ No \_\_\_\_\_

13. Do you have a place/form where you record the amount of medicines and supplies you distribute to the DAMS and the provincial hospital?  
Yes \_\_\_\_\_ No \_\_\_\_\_

13a. Was this form provided by the CMPE/MoH? Yes \_\_\_\_\_ No \_\_\_\_\_

14. Do you have a register book where you write the number of cases of malaria that were treated in the Province?  
Yes \_\_\_\_\_ No \_\_\_\_\_

14a. Was this form provided by the CMPE/MoH? Yes \_\_\_\_\_ No \_\_\_\_\_

 Don't forget to fill out the stock data information in the OBSERVATIONS section!

15. Do DAMS and Provincial hospital report to you on all the data? Yes \_\_\_\_\_ No \_\_\_\_\_

#### IV. ORDERING NEW STOCK/MANAGING STOCK-OUTS

16. When you need some more medicines or supplies, what do you do to get more?

17. This year did you have ever run out of Coartem or RDTs? Yes \_\_\_\_\_ No \_\_\_\_\_  
*If yes, ask the questions 17a – 17b; If no, go to question 18.*

17a. Can you tell me why?

17b. How long were you out of the medicine or RDT? \_\_\_\_\_  
*Try to estimate number of days, weeks or months.*

#### V. EXPIRED MEDICINE

*Take a blister of Coartem or an RDT, show the PAMS staff and ask:*

18. Could you show me the expiration date? Yes \_\_\_\_\_ No \_\_\_\_\_

18a. Has anybody told you what to do with that medicine after that date? Yes \_\_\_\_\_ No \_\_\_\_\_

18b. In case of yes, what do you have to do?

19. Have you told the DAMS what to do in this case? Yes \_\_\_\_\_ No \_\_\_\_\_

19a. What did you tell them?

*This section refers to how the PAMS reports on stock and morbidity to the CMPE.*

20. Does the CMPE ask you to report back to them on how much medicine you have given out and how much medicine you have? Yes \_\_\_\_\_ No \_\_\_\_\_

*If the answer is “no,” go to question 21*

20a. Do you have a form provided by the CMPE for this purpose? Yes \_\_\_\_\_ No \_\_\_\_\_

20b. If not, what do you use? \_\_\_\_\_

20c. How many times per year do you report on this information? \_\_\_\_\_

21. Do you have to report back to CMPE on district level stocks? Yes \_\_\_\_\_ No \_\_\_\_\_

21a. How do you consolidate the data?

22. Does the CMPE ask you to report back to them on how many malaria cases have been treated in the Province? Yes \_\_\_\_\_ No \_\_\_\_\_

*If the answer is “no,” go to question 23*

22a. Do you have a form provided by the CMPE for this purpose? Yes \_\_\_\_\_ No \_\_\_\_\_

22b. How many times per year do you report on this information? \_\_\_\_\_

**VII. TRAINING**

23. Did anyone explain to you how to store the medicine? Yes \_\_\_\_\_ No \_\_\_\_\_

*If the answer was no, go to question 24.*

23a. Who told you? \_\_\_\_\_

23b. When were you told? How long ago? \_\_\_\_\_

24. Did anyone explain to you how to fill out the forms or reports on medicines and supplies? Yes \_\_\_\_\_ No \_\_\_\_\_

*If the answer was no, go to question 25.*

25a. Who told you? \_\_\_\_\_

25b. When were you told? How long ago? \_\_\_\_\_

25. Did anyone explain to you how to fill out the forms or reports on malaria cases? Yes \_\_\_\_\_ No \_\_\_\_\_

*If the answer was no, go to question 26.*

25a. Who told you? \_\_\_\_\_

25b. When were you told? How long ago? \_\_\_\_\_

**VIII. ADDITIONAL INFORMATION**

26. Number of people who work at the PAMS: \_\_\_\_\_

27. How long have you been at this PAMS? \_\_\_\_\_

28. What is the position of the person interviewed? \_\_\_\_\_

29. Check all that are present and operational in the PAMS:

Cell phone	
Telephone	
Fax	
Computer	
Photocopier	
Connection to internet	

**OBSERVATIONS TO BE MADE BY THE DATA COLLECTOR**

**I. STOCK REGISTER**

*Ask the PAMS to show you the place where he records the amount of medicine and supplies he receives and dispenses.*

1. Does he have it? Yes \_\_\_\_\_ No \_\_\_\_\_

*If possible, take a picture of it*

2. Review it:

- Make a physical count of the medicines and supplies and compare with the register

	Record count	Physical count		Difference
		Non-expired	Expired	
Coartem 1*6				
Coartem 2*6				
Coartem 3*6				
Coartem 4*6				
RDT				
Artesunate sup				
Artesunate injection				

- What type of data does it provide? *Check all that apply*

Name of the products	
Dosage	
Expiration date	
Date issued or received	
Other ( <i>specify</i> )	

- Is it currently up to date? Yes \_\_\_\_ No \_\_\_\_
  - Ask how often the worker usually updates the information?
- 

## **II. AREA/PLACE WHERE MEDICINE IS STORED**

1. Describe where the medicine is kept:

Directly on the ground	
On pallets	
On shelves	
In a cupboard	
Other	
Sunlight	
Fan	
Air conditioner	

2. Are there signs of deterioration/degradation of the boxes or the blisters?

Yes \_\_\_\_ No \_\_\_\_

3. Is there some expired Coartem or RDTs stored with unexpired medicines? Yes \_\_\_\_ No \_\_\_\_

## **III. REGISTER BOOK FOR CASES OF MALARIA**

*Ask the PAMS worker to show you the place where he records information on MALARIA CASES in the Province..*

1. Does he have it? Yes \_\_\_\_\_ No \_\_\_\_\_

*If possible, take a picture of it*

- Is it currently up to date? Yes \_\_\_\_ No \_\_\_\_
  - Ask how often information is usually updated?
-

#### **IV. FORMS FOR REPORTING STOCK/ MALARIA CASES**

*Ask the PAMS to show you the form he uses to report back to the CMPE on stock and number of malaria cases.*

1. Does he have one form or more than one?      One \_\_\_\_ More \_\_\_\_\_

*If possible, take a picture of it/them, or try to take an empty copy.*

2. Review it:

- Does it seem to be filled out properly? \_\_\_\_\_
- Is the information complete? Yes \_\_\_\_ No \_\_\_\_
- Does it report on stocks of all the Province or only the PAMS? \_\_\_\_\_

## ANNEX 2. QUESTIONNAIRE FOR DISTRICT ANTIMALARIA STATION

<b>Province</b>	<b>District</b>
<b>Data collector</b>	<b>Phone number</b>
<b>Date of visit</b>	

### I. PROCUREMENT

1. How many times per year do you receive medicines and supplies for malaria? \_\_\_\_\_

*If different answers are given for different supplies, specify:*

a. Coartem	
b. RDTs (paracheck)	
c. Other medicines (artesunate)	
d. Other supplies (bednets)	

2. When was the last time you received one of these supplies? \_\_\_\_\_



*Please record the response in terms of number of months. For example, if the person says “around pimāi”, estimate how many months ago that was.*

3. Are they usually sent to you, or do you have to pick them up? \_\_\_\_\_

*If supplies are picked up, continue with question 4*

4. Where do you go to pick up the supplies? \_\_\_\_\_

5. How long does it take to get there? \_\_\_\_\_

6. How do you get there? *Check responses.*

a. Car	
b. Other (specify)	

7. Do you receive money for transportation costs? Yes \_\_\_\_\_ No \_\_\_\_\_

*If yes, ask the following questions:*

7a. How much do you receive for transportation? \_\_\_\_\_ kips

7b. From whom? \_\_\_\_\_

7c. How often? \_\_\_\_\_

8. How long does it take to go to the PAMS from here? \_\_\_\_\_

9. How often do you go to the PAMS? \_\_\_\_\_

10. How many times per month do you go to the village where the PAMS is, for any reason?  
\_\_\_\_\_

11. How many times did someone from the PAMS come to visit you last year? \_\_\_\_\_

### III. DISTRIBUTION

12. How many health centers do you send Coartem and RDTs to? \_\_\_\_\_

13. Does someone from the DAMS go to distribute supplies or do the health centers pick them up? Distribute \_\_\_\_\_ Pick up \_\_\_\_\_

*If supplies are picked up, go to question 14.*

13a. How do you usually get to the health centers?

a. Car	
b. Motorbike	
c. Other (specify)	

13b. Do you receive any money for transportation? Yes \_\_\_\_\_ No \_\_\_\_\_

*If yes, how much?* \_\_\_\_\_

14. Do you deliver the same amount of coartem and related supplies to each health center?  
Yes \_\_\_\_\_ No \_\_\_\_\_

14a. *If no*, How do you decide how much to send to each health center?  
\_\_\_\_\_  
\_\_\_\_\_

15. How many times per year are coartem and supplies either delivered or picked up?  
\_\_\_\_\_  
\_\_\_\_\_

16. Is there a special form or record where you write down information on distribution?

Yes \_\_\_\_\_ No \_\_\_\_\_

17. How long does it usually take from when you receive supplies from the PAMS to when the health centers receive them? \_\_\_\_\_

### **III. STOCK REGISTER**

18. Do you have a stock register where you record the amount of medicine and supplies you receive? Yes \_\_\_\_\_ No \_\_\_\_\_

18a. Was this form provided by the PAMS/CMPE/MoH? Yes \_\_\_\_\_ No \_\_\_\_\_

19. Do you have a place/form where you record the amount of medicines and supplies you distribute to the health centers and the district hospital? Yes \_\_\_\_\_ No \_\_\_\_\_

19a. Was this form provided by the PAMS/CMPE/MoH? Yes \_\_\_\_\_ No \_\_\_\_\_

20. Do you have a register book where you write the number of cases of malaria of the district? Yes \_\_\_\_\_ No \_\_\_\_\_

20a. Was this form provided by the PAMS/CMPE/MoH? Yes \_\_\_\_\_ No \_\_\_\_\_

21. Do Health Centers and District hospital report to you on all the data? Yes \_\_\_\_\_ No \_\_\_\_\_

### **IV. ORDERING NEW STOCK/MANAGING STOCK-OUTS**

22. When you need some more medicines or supplies, what do you do to get more?

---

---

---

23. This year did you have ever run out of Coartem or RDTs? Yes \_\_\_\_\_ No \_\_\_\_\_  
*If yes, ask the questions 23a – 23c; If no, go to question 24.*

23a. Can you tell me why?

---

---

23b. How long were you out of the medicine or RDT? \_\_\_\_\_  
*Try to estimate number of days, weeks or months.*

**V. EXPIRED MEDICINE**

*Take a blister of Coartem or an RDT, show the DAMS staff and ask:*

24. Could you show me the expiration date? Yes \_\_\_\_\_ No \_\_\_\_\_

24a. Has anybody told you what to do with that medicine after that date? Yes \_\_\_ No \_\_\_

24b. In case of yes, what do you have to do?  
.....  
.....

**VI. REPORTING THE STOCK AND CONSUMPTION DATA**

*This section refers to how the DAMS reports on stock and morbidity to the PAMS.*

25. Does the PAMS ask you to report back to them on how much medicine you have given out and how much medicine you have? Yes \_\_\_\_\_ No \_\_\_\_\_

*If the answer is “no., go to question 26*

25a. Do you have a form provided by the PAMS for this purpose? Yes \_\_\_ No \_\_\_

25b. If not, what do you use?.....

25c. How many times per year do you report on this information?.....

26. Does the PAMS ask you to report back to them on how many malaria cases in the district? Yes \_\_\_\_\_ No \_\_\_\_\_

26a. Do you have a form provided by the PAMS for this purpose? Yes \_\_\_ No \_\_\_

26b. If not, what do you use?.....

26c. How many times per year do you report on this information?.....

27. How do you consolidate the informations coming from the Health Centers and Hospital district? \_\_\_\_\_

**VII. TRAINING**

28. Did anyone explain to you how to store the medicine?      Yes \_\_\_\_\_ No \_\_\_\_\_

*If the answer was no, go to question 29.*

28a. Who told you? \_\_\_\_\_

28b. When were you told? How long ago? \_\_\_\_\_

29. Did anyone explain to you how to fill out the forms or reports on medicines and supplies?      Yes \_\_\_\_\_ No \_\_\_\_\_

*If the answer was no, go to question 30.*

29a. Who told you? \_\_\_\_\_

29b. When were you told? How long ago? \_\_\_\_\_

30. Did anyone explain to you how to fill out the forms or reports on malaria cases?      Yes \_\_\_\_\_ No \_\_\_\_\_

*If the answer was no, go to question 31.*

30a. Who told you? \_\_\_\_\_

30b. When were you told? How long ago? \_\_\_\_\_

**VIII. ADDITIONAL INFORMATION**

31. Number of people who work at the DAMS: \_\_\_\_\_

32. How long have you been at this DAMS? \_\_\_\_\_

33. What is the position of the person interviewed? \_\_\_\_\_

34. Check all that are present and operational in the DAMS:

Cell phone	
Telephone	
Fax	
Computer	
Connection to internet	
Photocopier	

**OBSERVATIONS TO BE MADE BY THE DATA COLLECTOR**

**I. STOCK REGISTER**

*Ask the DAMS staff member to show you the place where he or she records the amount of medicine and supplies he or she receives and dispenses.*

1. Does the staff member have it? Yes \_\_\_\_\_ No \_\_\_\_\_

*If possible, take a picture of it*

2. Review it:

- Make a physical count of the medicines and supplies and compare with the register

	Record count	Physical count		Difference
		Non-expired	Expired	
Coartem 1×6				
Coartem 2×6				
Coartem 3×6				
Coartem 4×6				
RDT				
Artesunate sup				
Artesunate injection				

- What type of data does it provide? *Check all that apply*

Name of the products	
Dosage	
Expiration date	
Date issued or received	
Other ( <i>specify</i> )	

- Is it currently up to date? Yes \_\_\_\_ No \_\_\_\_
  - Ask how often the worker usually updates the information?
- 

**II. AREA/PLACE WHERE MEDICINE IS STORED**

1. Describe where the medicine is kept:

Directly on the ground	
On palletes	
On shelves	
In a cupboard	
Other	
sunlight	
Fan	
Air conditioner	

2. Are there signs of deterioration/degradation of the boxes or the blisters?

Yes \_\_\_\_ No \_\_\_\_

3. Is there some expired Coartem or RDTs stored with unexpired medicines? Yes \_\_\_\_ No \_\_\_\_

**III. FORMS FOR REPORTING STOCK//MALARIA CASES DATA**

*Ask the DAMS to show you the form he uses to report back to the PAMS on stocks and malaria cases in the district*

1. Does he have one form or more than one? One \_\_\_\_ More \_\_\_\_

*If possible, take a picture of it/them, or try to take an empty copy.*

2. Review it:

- Does it seem to be filled out properly? \_\_\_\_\_
- Is the information complete? Yes \_\_\_\_ No \_\_\_\_
- Does it report on stocks of all the districts or only the DAMS?