

## Status of Antimalarial Supply Management in Countries of the Amazon Basin and Central America, October 2011

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## **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.

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## **Key Words**

antimalarials, fixed-dose combinations, management, medicines

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## CONTENTS

Acronyms and Abbreviations .....	v
Introduction.....	1
Methodology.....	3
Findings.....	5
Bolivia.....	5
Brazil.....	8
Colombia.....	11
Ecuador.....	13
Guyana.....	16
Peru.....	18
Suriname.....	21
Honduras.....	23
Nicaragua.....	25
Analysis and Discussion of the Status of Antimalarial Supply .....	31
Annex 1: Short- and Long-Term Work Plans, by Country.....	35
Bolivia.....	35
Colombia.....	37
Ecuador.....	38
Guyana.....	39
Honduras.....	40
Nicaragua.....	41
Peru.....	42
Suriname.....	43
Annex 2: System for Monitoring Medicine Availability: Exchanges and Donations within the Region.....	44
Annex 3: Treatment Regimens for <i>P. Falciparum</i> used in Countries of the Region, Standardization Status, 2011.....	49



## ACRONYMS AND ABBREVIATIONS

AMI	Amazon Malaria Initiative
AS	artesunate
ATM	artemether
BGVS	Bedrijf Geneesmiddelen Voorziening (Central Warehouse, Suriname)
BOG	Bureau voor Openbare Gezondheidsorg (Bureau of Public Health, Suriname)
CD	clindamycin
CPT	<i>Consolidado de Pedido Trimestral</i> (Consolidated Quarterly Antimalarial Order Report, Bolivia)
CQ	chloroquine
D	doxycycline
DARES	Dirección de Abastecimientos de Recursos Estratégicos (Directorate for Strategic Resource Supply, Peru)
DGIM	Dirección General de Insumos Médicos (Directorate General for Medical Supplies, Nicaragua)
DIGEMID	Dirección General de Medicamentos, Insumos y Drogas (Directorate General for Medicines, Commodities and Pharmaceuticals, Peru)
DPE	Dirección de Prevención de Enfermedades (Disease Prevention Directorate, Nicaragua)
ESNCEM	Estrategia Sanitaria Nacional de Control de Enfermedades Metaxénicas (National Health Strategy for the Control of Vector-Borne Diseases, Peru)
IDA	International Dispensary Association (Dutch foundation)
INS	Instituto Nacional de Salud (National Health Institute, Colombia)
LINAME	Lista Nacional de Medicamentos Esenciales (National List of Essential Medicines, Bolivia)
LUM	lumefantrine
MB	Malaria Board (Suriname)
MINSA	Ministerio de Salud (Ministry of Health, Nicaragua)
MOH	Ministry of Health
MP	Malaria Program (Suriname)
MPS	Ministerio de la Protección Social (Ministry of Social Welfare, Colombia)
MQ	mefloquine
MSDs	Malaria Service Deliverers (Suriname)
MSH	Management Sciences for Health
MZ	Medische Zending (Medical Mission ,Suriname)
NMCP	National Malaria Control Program
PAHO	Pan-American Health Organization
PQ	primaquine
Q	quinine
RAVREDA	<i>Red Amazónica de Vigilancia de la Resistencia a los Antimaláricos</i> (Amazon Network for Monitoring Antimalarial Drug Resistance)
RPM Plus	Rational Pharmaceutical Management Plus Program
SF	Strategic Fund

SISMED	Sistema Integral del Suministro de Medicamentos e Insumos Médicos Quirúrgicos (Integrated System for the Supply of Medicines and Medical-Surgical Materiales, Peru)
SIVEP	Epidemiological Monitoring System (Sistema de Informação de Vigilância Epidemiológica, Brazil)
SNEM	Servicio Nacional de Erradicación de la Malaria (National Malaria Eradication Service, Ecuador)
SILAIS	Sistemas Locales de Atención Integral en Salud (Local Systems for Integral Health Care, Nicaragua)
SPS	Strengthening Pharmaceutical Systems
S-P	sulfadoxine-pyrimethamine
TCM	Tarjeta de Consumo Mensual de Medicamentos e Insumos (Card for Recording Monthly Consumption of Medicines and Supplies, Bolivia)
UNIMED	Unidad Nacional de Medicamentos y Toxicología para la Salud (National Drug and Toxicology for Health Unit, Bolivia)
USAID	US Agency for International Development
USD	US dollars
UTSM	Unidad Técnica para el Suministro de Medicamentos (Technical Drug Supply Unit, Honduras)
WHO	World Health Organization

## INTRODUCTION

In 2001, the US Agency for International Development (USAID) launched its Amazon Malaria Initiative (AMI), the purpose of which is to improve malaria control and treatment in countries of the Amazon basin (Bolivia, Brazil, Colombia, Ecuador, Guyana, Peru, and Suriname). Since that time, with support provided by AMI, these countries have modified their treatment policies to include more effective therapeutic combinations. The countries of Central America have recently been incorporated into AMI. In recent meetings of the Initiative, two countries of the subregion—Honduras and Nicaragua—requested technical assistance in documenting the problems they face in managing antimalarial supply.

Through two USAID-financed projects, Management Sciences for Health (MSH) has been a technical partner of AMI in supporting medicine supply management since 2002. Together with other Initiative partners and counterparts, the Pan-American Health Organization (PAHO), the US Centers for Disease Control and Prevention, and the US Pharmacopeial Convention's Promoting the Quality of Medicines program, managers of National Malaria Control Programs (NMCPs) and local MSH missions have, through MSH's Rational Pharmaceutical Management Plus program (RPM Plus) and its Strengthening Pharmaceutical Systems (SPS) program, helped strengthen NMCP capacity to develop strategies for improving the supply of medicines and medical supplies.

Within this framework, member countries have carried out a wide range of activities designed to improve medicine supply. In 2008,<sup>1</sup> MSH/SPS prepared a document describing the status of antimalarial supply management in countries of the Amazon basin, and in 2009 a report was prepared describing the status of antimalarial drug supply in the countries of Central America.<sup>2</sup> In April 2011, a regional workshop was held in Cartagena, Colombia, to analyze problems affecting antimalarial supply management. The workshop concluded with the presentation and discussion of work plans prepared by country representatives, together with commitments from international cooperation organizations to provide the required support.<sup>3</sup>

This technical report includes up-to-date information on the status of antimalarial supply management in countries of the Amazon basin and two countries of Central America. The report was based on data gathered during the AMI-sponsored workshop held in Lima, Peru, in August 2011.

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<sup>1</sup> Barillas, Edgar, Claudia Valdez, and Silas Holland. 2008. *Situación de la gestión del suministro de medicamentos para el tratamiento de la malaria en los países que comparten la Cuenca Amazónica*. Submitted to the US Agency for International Development by the Strengthening Pharmaceutical Systems (SPS) Program. Arlington, VA: Management Sciences for Health.

<sup>2</sup> Strengthening Pharmaceutical Program (SPS). 2008. *Situación de la gestión del suministro de medicamentos para el tratamiento de la malaria en los países de Centroamérica*. Submitted to the US Agency for International Development by the SPS Program. Arlington, VA: Management Sciences for Health.

<sup>3</sup> Strengthening Pharmaceutical Systems (SPS). 2010. *Informe técnico: Reunión de trabajo para el análisis de los criterios de selección, programación de necesidades y adquisición de medicamentos antimaláricos*. Submitted to the US Agency for International Development by the Strengthening Pharmaceutical Systems (SPS) Program. Arlington, VA: Management Sciences for Health.





## METHODOLOGY

The following methodology was used in preparing this technical report:

1. **Review of background documentation:** A review was conducted of documents dealing with the status of antimalarial supply management from 2008 and 2009, trip reports from visits made recently to the various countries, and materials provided by country NMCPs.
2. **Gathering of additional information:** During the workshop “Working Session to Evaluate the Management of Antimalarials,” held in Lima, Peru (August 2011), additional information was collected from the presentations made by the various countries and interviews with workshop participants to complete and update the information included in this document.
3. **Report review and validation:** The consolidated report was reviewed by malaria program officers and technical personnel. Their comments and suggestions were incorporated into the final version of the report.



## FINDINGS

### Bolivia

In 2008, the NMCP reported periodic stock-outs of a number of antimalarials in health facilities.<sup>4</sup> Causes were attributed to poor estimation of requirements, which in turn was the result of a lack of information on consumption and stock on hand at the intermediate and local levels. Recognizing these failings, starting in 2011 the NMCP opted to implement the guidelines established by the *Sistema Nacional Único de Suministros* (national consolidated supply system), including a computerized system of inventory modules (Kardex including drug price), plus reports on monthly movements and consolidated quarterly reports on requisitions.

In 2010, PAHO's Strategic Fund (SF) confirmed to the NMCP the lack of providers of artesunate (AS) as a single-use drug used to treat *P. falciparum* malaria. To avoid a potential stock-out, the NMCP added to its National Drug List (LNAME 2011–2013) fixed-dose combinations of artesunate-mefloquine (AS-MQ) for treating *P. falciparum* malaria. This dosage form is being used in two priority regions where *P. falciparum* malaria is endemic (Pando and Riberalta). Based on the selected therapeutic regimens and on international recommendations as provided by the World Health Organization (WHO), the treatment card was updated (figure 1) and is currently in the process of being printed and distributed.

Since 2005, medicines to treat uncomplicated cases of malaria have been procured through PAHO/SF, and in 2010 PAHO/SF donated medicines for special and severe cases through financing provided by USAID/AMI. The average time lag between placement of an order and arrival of the medicines in Bolivia is 12 months. In April 2011, the NMCP submitted a request to PAHO/SF for the purchase of antimalarials to treat *P. vivax* malaria in 2012. Among the difficulties hampering procurement of AS-MQ as a fixed-dose combination is that it is available from only a single supplier, which has not been prequalified by PAHO/WHO. However, the NMCP received donations from that provider during 2010. AS-MQ availability hampers transition, at least in the short term, to other products and providers.

In 2010, use of the information system on consumption and availability for medicines and medical supplies was officially mandated; it is currently being implemented in the warehouses operated by the 10 departmental/regional malaria programs, 7 of which submit information reports on a quarterly basis. At the local level, information on consumption and availability is being reported periodically by means of two technical instruments: the Card for Recording Monthly Consumption of Medicines and Supplies (Tarjeta de Consumo Mensual, or TCM) and the Consolidated Quarterly Antimalarial Order Report (Consolidado de Pedido Trimestral, or CPT). Up-to-date reports on stock on hand are being generated, and operating procedures for managing medicine supplies at the local level are being reviewed and tested.

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<sup>4</sup> Barillas, Edgar, Claudia Valdez, and Silas Holland. 2008. *Situación de la gestión del suministro de medicamentos para el tratamiento de la malaria los países que comparten la Cuenca Amazónica*.

Edad	Rangos de Peso (Kg) <sup>1</sup>	NÚMERO DE TABLETAS POR DÍA						Edad	Rangos de Peso (Kg) <sup>1</sup>	NÚMERO DE TABLETAS POR DÍA	
		ARTESUNATO + MEFLOQUINA (Tab. Combinada /empaque)								PRIMAQUINA (Tab. Individual)	
		Tabletas de 25/55 mg			Tabletas de 100/220 mg					Tab. 5 mg	Tab. 15 mg
		1 <sup>er</sup> Día	2 <sup>o</sup> Día	3 <sup>er</sup> Día	1 <sup>er</sup> Día	2 <sup>o</sup> Día	3 <sup>er</sup> Día	Dosis única (3 <sup>er</sup> Día)			
6 - 11 meses	5 - 8							6 meses - 2 años	7,6 - 12	1 1/2	1/2
		<b>No corresponde</b>								2	1
1 - 5 años	9 - 17							5 - 7 años	13 - 16	3	1
		<b>No corresponde</b>								4	1 1/2
6 - 11 años	18 - 29	<b>No corresponde</b>						11 - 12 años	34 - 42	5 1/2	2
		<b>No corresponde</b>								6 1/2	2 1/2
≥ 12 años	≥ 30	<b>No corresponde</b>						13 - 14 años	43 - 58	9	3
		<b>No corresponde</b>								9	3

Se deberá usar la primaquina según la presentación con la que se disponga de 5 ó 15 mg de acuerdo como se indica en las columnas de primaquina.

Figure 1. Malaria treatment card

In 2010 and 2011, conditions for storing antimalarials and supplies were improved in four priority regions where malaria is endemic: Riberalta, Guayaramerín, Pando, and Yacuiba. These improvements were financed with funds made available by the Global Fund to Fight AIDS, Tuberculosis and Malaria.

Distribution of medicines and supplies from the central level is carried out in accordance with the antimalarial requirements indicated in the CPT. The principal difficulties identified are ongoing delays and other problems in the distribution chain resulting from shortages of human resources and means of transportation.

With MSH/SPS support, a system was introduced in 2010 for supervising health facilities, and in that same year the NMCP developed and distributed its supervision guidelines and a technical card for systematizing supervision activities within the malaria diagnosis and treatment network. The supervision system was implemented in three priority regions designated by the NMCP. The first round of monitoring implementation of the supervision system, which took place between April and June 2011, identified weaknesses in the information analysis process that were attributed to the lack of human and logistics resources.<sup>5</sup>

<sup>5</sup> Jiménez, Magdalena. 2011. *Monitoreo de supervisión a los puestos de diagnóstico y tratamiento de la malaria en tres regiones prioritarias del Programa Nacional de Control de la Malaria en Bolivia*. Submitted to the US Agency for International Development by the Strengthening Pharmaceutical Systems (SPS) Program. Arlington, VA: Management Sciences for Health.

The third-quarter report for 2011 on the availability of antimalarials for treating severe or special cases<sup>6</sup> revealed that 66 percent of all medicines were available at the central warehouse level, and 100 percent were available at departmental warehouses. However, a stock-out of six medicines (45 percent) for treating cases of *P. falciparum* and *P. vivax* was reported for the preceding six-month period, including AS 50 mg, clindamycin (CD) 300 mg, primaquine (PQ) 15 mg and 5 mg, and quinine (Q) 300 mg (table 1). During the workshop held in Lima in August 2011, the causes for these stock-outs were discussed. The principal reasons identified were the lack of standardized criteria for the distribution of specific medicines to treat *P. falciparum*, the absence of available providers at the time purchases are requested (such as the case of PQ 15 mg and 5 mg) through PAHO/SF, and drawn-out administrative procedures in the Ministry.

**Problems identified:** Periodic stock-outs were reported of medicines used to treat complicated and uncomplicated cases of *P. falciparum* and *P. vivax* malaria. No qualified provider of AS-MQ is available, and Bolivia currently depends on donations to meet its requirements. The lack of human and logistics resources at the regional and departmental levels hampers consolidation of the data generated by the information system.

**Short-term plans:** Request a new donation of AS-MQ from Farmanguinhos for 2012. Ask the National Pharmacology Commission to reconsider the inclusion of artemether-lumefantrine (ATM-LUM) in LINAME. Develop the program down to the first level for areas of low incidence. Monitor consolidation of the manual system to generate information on medicine supply management on the CPT and the TCM, and distribute and implement the supply management card at the local level (see annex 1).

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<sup>6</sup> Marmion, John, and Henry Espinoza 2011. *Análisis de la disponibilidad de medicamentos antimaláricos en países de la cuenca del Amazonas: tercer trimestre 2011*. Submitted to the US Agency for International Development by the Strengthening Pharmaceutical Systems (SPS) Program. Arlington, VA: Management Sciences for Health.

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**Table 1. Bolivia: Availability of Medicines in the Central Warehouse, Second Quarter, 2011**

Medicines		Units available in the central warehouse as of June 30, 2011	Availability in months, based on consumption	Stock-out during the preceding six- month period?
Treatment for <i>P. falciparum</i>	Artesunate 50 mg tabs.	7,430	11.1	Yes
	Artesunate-mefloquine 100/220 mg x 3 tabs.	0	0.0	Yes
	Artesunate-mefloquine 100/220 mg x 6 tabs.	0	0.0	Yes
	nArtesunate-mefloquine 25/55 mg x 3 tabs.	0	0.0	Yes
	Artesunate-mefloquine 25/55 mg x 6 tabs.	0	0.0	Yes
	Mefloquine 250 mg tabs.	16,396	79.6	No
Treatment for <i>P. vivax</i>	Chloroquine phosphate 150 mg tabs.	753,937	14.5	No
	Primaquine phosphate 15 mg tabs.	235,097	37.3	Yes
	Primaquine phosphate 5 mg tabs.	40,325	21.3	Yes
Treatment for severe and special cases	Artesunate sodium bicarbonate 60 mg/1 ml amp.	30*	30.0	No
	Clindamycin hydrochloride 150 mg cap.	3,000*	0.0	No
	Clindamycin hydrochloride 300 mg cap.	4,232	28.8	Yes
	Quinine sulfate 300 mg tabs.	11,142	80.7	Yes
	Quinine dichlorhydrate 300 mg/mL x 2 mL amp.	295	26.8	No
	Quinine dichlorhydrate 600 mg/mL x 2 mL amp.	75	7.5	Yes

Source: System for Quarterly Monitoring of Antimalarial Availability and Consumption (2011).

\* Consumption data were not reported.

## Brazil

In 2008, the NMCP reported no stock-outs of antimalarials.<sup>7</sup> In that same year, implementation at the national level of a pilot test of the system for information on medicine consumption and inventories in the entire supply chain had progressed considerably.

In late 2008, the NMCP had completed introduction of the use of ATM-LUM for treating *P. falciparum* at the national level. By 2011, following the accords reached at the AMI workshop

<sup>7</sup> Barillas, Edgar, Claudia Valdez, and Silas Holland. 2008. *Situación de la gestión del suministro de medicamentos para el tratamiento de la malaria los países que comparten la Cuenca Amazónica*.

held in Cartagena, Brazil's Technical Therapeutic Commission came out in favor of including PQ in first-line schemes for treating *P. falciparum* malaria. National guidelines were revised, and the only remaining step was their publication in the second quarter of 2011.

Since 2006, artemisinin-based combination medicines are being purchased through PAHO/SF. The most recent purchase process, from submission of request to delivery, took 12 months. All other medicines are procured by the Ministry of Health from official laboratories. In the 2010 purchase, problems occurred in complying with agreements reached between PAHO/SF and the Ministry of Health, which led to delays in product delivery, poor-quality packaging, and failure to comply with Ministry requirements involving provision of technical information on shipments. In addition, procurements made through national laboratories experienced delays in delivery because of difficulties in the procurement of raw materials and problems affecting production equipment.

Medicines and supplies are distributed to individual states every three months. In areas of low incidence and difficult access, such as is the frontier with Guyana and Suriname, where malaria occurs in population groups living in special conditions (miners), delivery time from the state level to peripheral areas is quite long (frequently in excess of six months).

In 2011, a model of the on-line Epidemiological Monitoring System (Sistema de Informação de Vigilância Epidemiológica; SIVEP), which records consumption and stock on hand at the local level, was being implemented for malaria. This includes consolidation and integration of information into SIVEP from the Amazon region and beyond. Difficulties exist in recording consumption and stock on hand for all weigh and age groups; in addition, because the system operates on an Internet platform, its use is difficult in certain areas of the Amazon region.

With support provided by MSH/SPS, the NMCP has developed a supervision instrument that has been implemented in Amazonas and Acre states. An evaluation of the supervision system completed in 2011 revealed difficulties in complying with the supervision program in more geographically remote facilities, as well as a failure to consolidate information at the state level.

The report on medicine availability as of June 2011 showed central warehouse availability equal to 89 percent, with availability of ATM 80 mg/ml at less than one month's supply and complete stock-outs of other medications, such as CD 300 mg in capsules and 150 mg/ml in ampoules (table 2).

During the August 2011 workshop held in Lima, the causes of these stock-outs were discussed. According to workshop participants, the principal reasons had to do with lengthy processes for making purchases from international providers through PAHO/SF and delays in national tender procedures for local purchases. By the third quarter of 2011,<sup>8</sup> it could be seen that 94 percent of medicines for treating all malaria cases were available at the central level; the 6 percent reported as unavailable related to doxycycline (D) 100 mg in capsules.

**Table 2. Brazil: Availability of Medicines in the Central Warehouse, Second Quarter, 2011**

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<sup>8</sup> Marmion, John, and Henry Espinoza. 2011. *Análisis de la disponibilidad de medicamentos antimaláricos en países de la cuenca del Amazonas: tercer trimestre 2011*.

*Status of Antimalarial Supply Management in Countries of the Amazon Basin and Central America,  
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Medicines	Units available in the central warehouse as of June 30, 2011	Availability in months, based on consumption	Stock-out during the preceding six-month period?	
<b>Treatment for <i>P. falciparum</i></b>	Artemether-lumefantrine 20 mg + 120 mg c/6 tabs.	32,940	6.3	Yes
	Artemether-lumefantrine 20 mg + 120 mg c/12 tabs.	140,760	7.8	Yes
	Artemether-lumefantrine 20 mg + 120 mg c/18 tabs.	204,120	7.6	Yes
	Artemether-lumefantrine 20 mg + 120 mg c/24 tabs.	1,531,440	25.6	No
	Artesunate-mefloquine 25 mg/55 mg c/3 tabs.	67,260	7.2	Yes
	Artesunate-mefloquine 25 mg/55 mg c/6 tabs.	98,760	2.1	Yes
	Artesunate-mefloquine 100 mg/220 mg c/3 tabs.	14,280	2.6	Yes
	Artesunate-mefloquine 100 mg/220 mg c/6 tabs.	178,620	4.0	No
<b>Treatment for <i>P. vivax</i></b>	Chloroquine 150 mg tabs.	5,618,500	17.8	No
	Primaquine phosphate 5 mg tabs.	1,566,000	13.0	No
	Primaquine phosphate 15 mg tabs.	5,598,500	14.1	No
<b>Treatment for severe and special cases</b>	Artemether 80 mg/mL 1 mL amp.	160	0.04	Yes
	Sodium artesunate 60 mg amp.	17,685	2.5	Yes
	Clindamycin 150 mg 4 mL amp.	0	0.0	Yes
	Clindamycin 300 mg cap.	0	0.0	Yes
	Doxycycline 100 mg cap.	11,500	3.2	No
	Quinine sulfate 500 mg tabs.	229,500	28.9	No
	Quinine dichlorhydrate 125 mg/mL 4 mL amp.	229,500	28.99	Yes

Source: System for Quarterly Monitoring of Antimalarial Availability and Consumption (2011).

**Problems identified:** During 2010–2011, stock-outs were reported for a number of medicines used to treat *P. falciparum*, attributable to delays in the procedures applicable to PAHO/SF procurements and tender proceedings at the local level.

**Short-term plans:** Monitor purchasing processes to provide early warning of potential stock-outs caused by delays in delivery. Change the dosage form from Q 125 mg/mL (4 mL) to Q 300 mg/mL (2 mL) to facilitate joint purchasing through PAHO/SF. Update Supply Management Guidelines for use at the local level (see annex 1).



## Colombia

During 2008, Colombia experienced stock-outs of a number of antimalarials.<sup>9</sup> Among the causative factors were difficulties in estimating needs for ATM-LUM, constraints to developing an information system providing data on morbidity and consumption to properly plan purchases, drawn-out processes for purchasing through national tenders, lack of a planning system that takes into account foreseeable occurrences (lengthy lead times for purchases), and lack of standardized criteria for managing the supply chain.

During the AMI/MSH workshop held in Cartagena in 2010,<sup>10</sup> the NMCP presented the revised version of its Guidelines for the Clinical Care of Malaria (Ministerial Resolution 2257/June 2011). The current Guidelines for Clinical Care take into account the significant and rapid reduction of gametocytes observed during treatment with artemisinin derivatives; because of the need to ensure optimum adherence to this treatment, the guidelines recommend, as a complement to the ATM-LUM regimen for treating uncomplicated *P. falciparum*, the use of one dose of PQ on the third day, solely for the purpose of controlling specific foci where the objective is a maximum impact on transmission.

Since 2010, antimalarials have been procured through PAHO/SF. The most recent purchase process, from the time the order was placed to delivery of the medicines, took approximately 12 months. In the procurement process for 2010 and 2011, delays were experienced in administrative procedures and purchase times. Changes in the dates for delivering medicines by providers to the SF and failure to comply with requested medicine labeling (labels did not include the phrase “For use exclusively by the Ministry,” and some labels were printed in a foreign language) also occurred. As of August 2011, it was not clear what mechanism was to be used for procuring CD and D, both of which are included in the Guidelines for the Clinical Care of Malaria; in principle, these two medicines should be purchased by the health insurance system, given that they are part of the Mandatory Health Plan.

In 2010, the Ministry of Social Welfare (Ministerio de la Protección Social; MPS) contracted with a logistics firm to distribute antimalarials from the central level to departmental warehouses. However, difficulties still persist at the departmental level in transporting these medicines to municipal diagnostic and treatment centers.

For 2011, the central warehouse shows adequate conditions for medicine storage, and good storage practices are observed. An electronic record is kept in the central-level MPS offices, while a physical record is kept in the warehouse itself for incoming and outgoing flows of medicines. The medicine warehouse submits a regular report to the NMCP showing stock on hand.

With support from AMI/PAHO/MSH, and with participation by the MPS and the National Health Institute (Instituto Nacional de Salud; INS), the NMCP developed guidelines for

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<sup>9</sup> Barillas, Edgar, Claudia Valdez, and Silas Holland. 2008. *Situación de la gestión del suministro de medicamentos para el tratamiento de la malaria los países que comparten la Cuenca Amazónica*.

<sup>10</sup> “Taller de Selección, programación de necesidades y adquisición de medicamentos antimaláricos en los países que comparte la Cuenca del Amazonas,” Cartagena, Colombia, April 2010.

supervising the malaria diagnostic and treatment network. The supervision instrument was implemented in seven departments designated as a priority for malaria. An evaluation of the supervision system carried out in 2010 revealed its usefulness in identifying and solving problems occurring in health posts but showed limited compliance with supervision schedules as well as difficulties in consolidating and analyzing information to inform strategic decision making at the departmental level. The malaria project financed by the Global Fund to Fight AIDS, Tuberculosis and Malaria is currently strengthening this initiative by supporting supervision activities and facilitating the recording of indicators of the proper functioning and productivity of the diagnostic and treatment network.

The antimalarial availability report for the third quarter of 2011<sup>11</sup> reveals that 54 percent of the required medicines were available at the central warehouse and 77 percent at the departmental level. As of June 2011, the central level reported availability of less than one month's supply of ATM-LUM in packets of 24 tablets and PQ 15 mg (table 3). During the regional workshop held in Lima in August 2011, the possible causes of these stock-outs were discussed. According to participants, the causes lie in delays in administrative procedures within the Ministry for procuring medicines through PAHO/SF, changes in the dates for delivery of medicines by providers to the SF, and difficulties in distributing medicines to remotely located areas.

**Problems identified:** Periodic stock-outs were reported, primarily in the central warehouse, of certain medications for the treatment of both complicated and uncomplicated *P. falciparum* and *P. vivax*, owing to delays in purchases from the PAHO/SF, lack of standardized scheduling procedures and criteria (including safety stocks), and difficulties in distributing medicines from the central warehouse to departmental warehouses.

**Short-term plans:** Follow up on the purchase order placed with PAHO/SF for 2012. Define criteria for reserves/safety stock and losses. Provide support to priority departments in defining criteria for determining safety stock and loss percentages. Modify the instrument for estimating central-level needs, and document the procedure for scheduling purchases. Define and document the process for purchasing CD and D using MPS public health resources. Contribute to the development of a system for distributing medicines among the various levels of program management. Facilitate institutionalization of the process for implementing the strategy for supervising the diagnostic and treatment network (see annex 1).

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<sup>11</sup> Marmion, John, and Henry Espinoza. 2011. *Análisis de la disponibilidad de medicamentos antimaláricos en países de la cuenca del Amazonas: tercer trimestre 2011*.

Table 3. Colombia: Availability of Medicines in the Central Warehouse, Second Quarter, 2011

Medicines		Units available in the central warehouse as of June 30, 2011	Availability in months, based on consumption	Stock-out during the preceding six-month period?
Treatment for <i>P. falciparum</i>	Artemether-lumefantrine 20 mg + 120 mg c/06 tabs.	86,316	9.0	Yes
	Artemether-lumefantrine 20 mg + 120 mg c/12 tabs.	124,826	4.7	Yes
	Artemether-lumefantrine 20 mg + 120 mg c/18 tabs.	207,270	4.1	Yes
	Artemether-lumefantrine 20 mg + 120 mg c/24 tabs.	66,432	0.5	No
Treatment for <i>P. vivax</i>	Chloroquine 150 mg tabs.	748,020	5.6	No
	Primaquine phosphate 5 mg tabs.	171,590	2.6	No
	Primaquine phosphate 15 mg tabs.	140,128	0.5	No
Treatment for severe and special cases	Artesunate rectal 100 mg. sup.	7,716	7.3	No
	Sodium artesunate 60 mg amp.	5,000	*	No
	Clindamycin chlorhydrate 300 mg cap.	0	0.0	Yes **
	Quinine dichlorhydrate 300 mg/2mL amp.	11,620	1.6	Yes
	Quinine sulfate 300 mg tabs.	150,300	6.5	Yes

Source: System for Quarterly Monitoring of Antimalarial Availability and Consumption (2011).

\*Consumption data were not reported.

\*\*The MPS stopped purchases of this medicine because its provision is the responsibility of the insurance system.

## Ecuador

No interruptions were reported in the availability of medicines in 2008<sup>12</sup> for population groups accounting for the greatest percentage of cases diagnosed and treated. However, a stock-out was observed for medicines for special groups (severe cases and cases showing resistance to primary treatment regimens).

In 2010, the NMCP began the process of updating the therapeutic guidelines for the malaria program, replacing the regimen based on AS + sulfadoxine-pyrimethamine (S-P) with ATM-LUM in a fixed-dose combination. This step was taken as a result of problems occurring with the supply of antimalarials reported at the regional level between 2010 and 2011, and particularly as a result of the lack of providers of AS in a single-drug presentation for treating *P. falciparum*

<sup>12</sup> Barillas, Edgar, Claudia Valdez, and Silas Holland. 2008. *Situación de la gestión del suministro de medicamentos para el tratamiento de la malaria en los países que comparten la Cuenca Amazónica*.

malaria. Beginning in 2012, the NMCP plans to use combined ATM-LUM therapy as its first-line treatment, together with a dose of PQ. The use of chloroquine (CQ) + PQ for seven days continues to be the first-line regimen for the treatment of *P. vivax* malaria.

In May 2011, with technical assistance provided by MSH/SPS, criteria were developed for estimating medicine needs and planning distribution, taking into account areas with low incidence levels. It is hoped that this will ensure the availability of strategic stock in all health facilities. These criteria have already been included in calculations for estimating medicine needs and planning distribution at both the central and health zone levels. They are also being incorporated into the National Antimalarial Policy.

For 2011–2012, the National Malaria Eradication Service (Servicio Nacional de Erradicación de la Malaria; SNEM) plans to use a number of procurement mechanisms to ensure the uninterrupted availability of antimalarials, including participation in consolidated purchases made through PAHO/SF, as well as purchases made at the local level.

The treatment adherence study conducted by MSH/PAHO in 2009<sup>13</sup> recommended continued use of pictorial instructions as a strategy for promoting adherence to treatment. A number of practices were reviewed and improved by the NMCP, including the availability of up-to-date therapeutic guidelines in all facilities, delivery of pictorial instructions to all patients, and introduction of the co-blister based on age group, as established in national guidelines. No subsequent studies have been carried out to verify the effect of these interventions on adherence to treatment.

The bimonthly report on consumption and stock on hand from area warehouses to the central level was implemented in 2010. A compliance level of 82 percent in the information consolidation process was recorded in April 2011.<sup>14</sup> Currently, the information generated by the NMCP on medicine consumption and availability is forwarded immediately to the Sistema Único de Gestión de Medicamentos e Insumos (national consolidated supply system), which consolidates national information on all medicines.

The 2011 third-quarter report on the availability of antimalarials<sup>15</sup> showed that 67 percent of these medicines were available at the central warehouse and 100 percent at the departmental level. As of June 2011, availability was less than one month's supply of PQ 7.5 mg at the central warehouse, with a total stock-out of AS + S-P (for adolescents) (table 4). During the workshop held in Lima in August 2011, the causes of these stock-outs were discussed. According to participants, the reasons can be found in the recent updating of therapeutic guidelines (replacement of AS + S-P by ATM-LUM, failure to make appropriate programmatic adjustments, and lack of providers in the international market). Despite these problems, the

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<sup>13</sup> Avecillas, J., and K. Sacoto. 2009. *Estudio de prácticas de prescripción, dispensación y adherencia al tratamiento antimaláricos en Ecuador* (draft). MSH/SPS, Arlington, VA.

<sup>14</sup> Informes: Monitoreo trimestrales de disponibilidad y consumo de medicamentos antimaláricos, Ecuador: Junio 2010 a junio 2011.

<sup>15</sup> Marmion, John, and Henry Espinoza. 2011. *Análisis de la disponibilidad de medicamentos antimaláricos en países de la cuenca del Amazonas: tercer trimestre 2011*.

availability of antimalarials for treating uncomplicated cases has improved from 50 percent to 89 percent from January 2010 through June 2011.<sup>16</sup>

**Problems identified:** Periodic stock-outs in the central warehouse were detected for some medicines used to treat usual cases of *P. falciparum* and *P. vivax* as well as excess stocks of certain other medicines. These low levels of antimalarial availability in the central warehouse can hamper implementation of the criteria for planning and distribution of medicines in areas of low incidence during 2012.

**Short-term plans:** Accelerate the process of procuring, importing, and distributing the ATM-LUM presentation that will replace current presentations of AS + S-P (before their expiration date in December 2011). Develop plans for providing training and implementing use of the various dosage presentations of this new antimalarial. Evaluate implementation of criteria for planning and distributing antimalarials in areas of low incidence (see annex 1).

**Table 4. Ecuador: Availability of Medicines in the Central Warehouse, Second Quarter, 2011**

Medicines	Units available in the central warehouse as of June 30, 2011	Availability in months, based on consumption	Stock-out during the preceding six-month period?	
Treatment for <i>P. falciparum</i>	Artemether-lumefantrine 20 mg + 120 mg c/24 tabs.	2,767	7.5	No
	Artesunate + sulfadoxine-pyrimethamine (children)	4,726	225.1	No
	Artesunate + sulfadoxine-pyrimethamine (adolescents)	0	0.0	Yes
	Artesunate + sulfadoxine-pyrimethamine (adults)	1,370	685.0	No
Treatment for <i>P. vivax</i>	Chloroquine phosphate 150 mg tabs.	13,820	10.3	No
	Primaquine phosphate 7.5 mg tabs.	238	0.4	Yes
	Primaquine phosphate 15 mg tabs.	10,660	5.6	No
Treatment for severe and special cases	Quinine dichlorhydrate 300 mg/mL × 2 mL amp.	212	42.4	No
	Quinine dichlorhydrate 600 mg/mL × 2 mL amp.	1,680	672.0	No

Source: System for Quarterly Monitoring of Antimalarial Availability and Consumption (2011).

<sup>16</sup> Informes: Monitoreo trimestrales de disponibilidad y consumo de medicamentos antimaláricos, Ecuador: Junio 2010 a junio 2011.

## **Guyana**

In 2008, a stock-out was reported for the adult dosage presentation of ATM-LUM. During that period, however, treatments were not discontinued, and adult patients were given presentations intended for children or, alternatively, second-line regimens in accordance with the treatment guidelines. This situation was attributable to errors in distribution to the regions and to quantification inaccuracies.

In 2010, following the accords reached at the AMI/MSH meeting held in Cartagena, national treatment guidelines were reviewed and a decision made to include PQ in the treatment of *P. falciparum* and mixed malaria. This document stipulates explicitly the use of AS + MQ together with a single dose of PQ as a second-line regimen for treating *P. falciparum* malaria, and CQ + PQ (14 days) for treatment of infections caused by *P. vivax*. These new guidelines are currently in the final stages of approval by the Ministry of Health.

In 2010, estimates of antimalarial needs were included in the annual cycle of estimates that are prepared by the Ministry of Health and reviewed every six months. The NMCP has not established criteria for the supply of medicines in areas of low transmission. In 2011, with support provided by PAHO, the NMCP began the process of printing and distributing standard operating procedures for managing the supply of antimalarials.

Most malaria medicines are procured by purchases made locally and through a number of international cooperation agencies approved by the Ministry, for example, the United Nations and the International Dispensary Association (IDA) Foundation. Since 2010, ATM-LUM has been procured under an agreement reached with PAHO/SF.

Availability of medicines in the central warehouse as of June 2011 averaged 7.1 months' supply (with ranges between 0 and 77 months). A stock-out for seven medicines (58 percent) during the six preceding months, availability of less than one month's supply of ATM-LUM 20/120 mg/12 tablets, and total stock-outs of AS 100 mg and 50 mg and PQ 7.5 mg in tablet form were reported (table 5). During the workshop held in Lima in August 2011, the reasons for these stock-outs were discussed. According to participants, these stock-outs are attributable to an increase in the use of the second-line regimen by prescribers and to drawn-out administrative procedures in the Ministry of Health, both of which lead to delays in procurements and prolonged processes for making purchases from international providers through PAHO/SF.

**Problems identified:** Periodic stock-outs were observed of medicines for treating uncomplicated cases of *P. falciparum*, attributable to lengthy procurement processes. The information system does not provide for the flow of information on the supply of antimalarials from local levels to the central level, and no quality control is performed with regard to consumption information provided by health facilities. No criteria exist for the supply of medicines in areas of low incidence.

**Short-term plans:** Simplify procurement procedures between Guyana's Ministry of Health, the PAHO office in Guyana, and PAHO headquarters in Washington. Develop a contingency plan for supplying critical commodities, and identify other potential suppliers. Ensure the timely

submission of needs based on PAHO/SF delivery times. Publish the updated Standards of Care. Ensure the updating and dissemination of scheduling criteria. Implement quality control over information on integrated consumption generated by health facilities. Update the computer software for preparing the annual budget estimate. Develop criteria for governing the supply of medicines in areas of low transmission. Strengthen supply management by implementing the supervision system (see annex 1).

**Table 5. Guyana: Availability of Medicines in the Central Warehouse, Second Quarter, 2011**

Medicines		Units available in the central warehouse as of June 30, 2011	Availability in months, based on consumption	Stock-out during the preceding six-month period?
Treatment for <i>P. falciparum</i>	Artesunate 50 mg tabs.	0	0.0	Yes
	Artesunate 100 mg tabs.	0	0.0	Yes
	Artemether-lumefantrine 20 mg + 120 mg c/06 tabs.	2,520	3.0	Yes
	Artemether-lumefantrine 20 mg + 120 mg c/12 tabs.	816	0.8	Yes
	Artemether-lumefantrine 20 mg + 120 mg c/18 tabs.	6,840	2.9	Yes
	Artemether-lumefantrine 20 mg + 120 mg c/24 tabs.	56,160	1.1	Yes
	Mefloquine 250 mg tabs.	18,780	5.6	No
Treatment for <i>P. vivax</i>	Chloroquine phosphate 150 mg tabs.	84,000	3.8	No
	Primaquine phosphate 15 mg tabs.	48,000	7.5	No
	Primaquine phosphate 7,5 mg tabs.	0	0.0	Yes
Treatment for severe and special cases	Quinine dichlorhydrate 300 mg/mL amp.	1,660	8.5	No
	Quinine sulfate 300 mg tabs.	83,550	16.71	No

Source: System for Quarterly Monitoring of Antimalarial Availability and Consumption (2011).

## **Peru**

In 2008, no stock-outs of medicines for treating usual cases of malaria were reported.<sup>17</sup> However, occasional stock-outs of medicines for treating severe cases were reported. Quinine in ampoule form was in short supply because of the lack of providers in the national market. The significant reduction in the number of cases of malaria has resulted in a situation in which the relatively small amounts of these medicines requested from national providers are not commercially attractive to national providers.

Beginning in 2009, the technical committee for the National Health Strategy for Controlling Vector-Borne Diseases (Estrategia Sanitaria Nacional de Control de Enfermedades Metaxénicas; ESNCEM) decided to standardize the use of the AS + MQ scheme for treating *P. falciparum* in all areas of the country. The ESNCEM has decided to maintain the AS + MQ regimen for treating *P. falciparum*, although these medicines are not available in a fixed-dose combination. It is felt that this treatment should be maintained to avoid modification of guidelines and retraining of staff in a situation marked by a sharp reduction in incidence.

In January 2011, a workshop was held to establish criteria for estimating antimalarial needs and distribution in areas of low incidence; implementation of these criteria is still pending.

Currently, all antimalarials used are included on the list of essential medicines approved in 2010. Medicines for treating usual cases of malaria are procured locally by the Ministry of Health. During 2010, medicines for treating severe cases were received in the form of a donation from PAHO/SF.

Plans for 2012 call for using a number of mechanisms for procuring antimalarials to ensure their uninterrupted availability: purchases from national providers, international purchases made through PAHO/SF, and donations secured through PAHO/SF with funds provided by USAID/AMI.

The Directorate General for Medicines, Supplies, and Pharmaceuticals (Dirección General de Medicamentos, Insumos y Drogas; DIGEMID) has in place a fully computerized Integrated System for the Supply of Medicines and Medical-Surgical Supplies (SISMED) that records stock on hand and consumption of medicines in health facilities and departmental and regional warehouses. Even though this information system is in place in all Regional Health Directorates, limitations still exist in the quantity, quality, and timeliness of the information reported by health facilities operating at the primary level of care.

In 2012, MSH/SPS, in collaboration with AMI member countries, plans to implement a regional monitoring system for antimalarial availability, which DIGEMID will coordinate.

In 2011, the Directorate for Strategic Resource Supply (Dirección de Abastecimiento de Recursos Estratégicos; DARES), which is the agency responsible for scheduling and procuring medicines for the SISMED, began operation.

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<sup>17</sup> Barillas, Edgar, Claudia Valdez, and Silas Holland. 2008. *Situación de la gestión del suministro de medicamentos para el tratamiento de la malaria los países que comparten la Cuenca Amazónica*.



National purchases tend to be made with instructions for delivery to the consignee (i.e., the regions), as a result of which most of the time no inventories of antimalarials are on hand in the central warehouse.

Medicine availability in the central warehouse as of June 2011 showed an average of 1.3 months' supply, with ranges between 0 and 11.4 months. Medicines that were available included AS for treating severe cases of *P. falciparum* and CQ and Q in tablets and ampoules, with availability equal to less than one month's availability (table 6). At the regional level, however, antimalarial availability showed a different picture, with availability in excess of 10 months' supply for most medicines, and zero stock-outs during the preceding six-month period (table 7).

The report on medicine availability for the third quarter of 2011 showed that 13 percent of antimalarials were available at the central level. Those medicines not available included primarily antimalarials for treating severe cases and cases of *P. vivax* malaria. At the departmental level, 100 percent of medicines for treating uncomplicated and complicated cases were reported as being available. During the workshop held in Lima in August 2011, the causes of these stock-outs were discussed. According to participants, causes include the failure to make planning adjustments to account for the limited access to computerized information systems for consolidation of information on consumption at the health facility level, lack of quality control over that information, and an absence of providers in the national market.

**Problems identified:** Stock-outs were reported for some antimalarials resulting from the limited number of national providers of medicines to treat uncomplicated cases. Those that do have these medicines available charge high prices. Institutionalized criteria for estimating needs are lacking, and information on stock on hand and consumption at the health facility level is of poor quality.

**Short-term plans:** For 2012, plans include using a number of mechanisms for medicine procurement: purchases made from national providers, purchases made through PAHO/SF, and donations secured through PAHO/SF with funding provided by USAID/AMI. Implement established criteria for the storage of reserve stocks of medicines in areas characterized by low transmission and continued risk. Exercise quality control over SISMED information generated by health facilities (see annex 1).

**Table 6. Peru: Availability of Medicines in the Central Warehouse, Second Quarter, 2011**

Medicines		Units available in the central warehouse as of June 30, 2011	Availability in months, based on consumption	Stock-out during the preceding six- month period?
Treatment for <i>P. falciparum</i>	Artesunate 50 mg tabs.	0	0.0	Yes
	Artesunate 250 mg tabs	0	0.0	Yes
	Mefloquine 250 mg tabs	0	0.0	Yes
Treatment for <i>P. vivax</i>	Chloroquine phosphate 150 mg tabs	4,380	0.1	No
	Primaquine phosphate 7.5 mg tabs	0	0.0	Yes
	Primaquine phosphate 15 mg comp.	0	0.0	Yes
Treatment for severe and special cases	Artesunate 60 mg tabs	320	11.4	No
	Quinine 300 mg/mL x 2 mL amp.	10	0.1	No
	Quinine 300 mg tabs	206	0.2	Yes

Source: System for Quarterly Monitoring of Antimalarial Availability and Consumption (2011).

**Table 7. Peru: Availability of Medicines in the Regional Warehouses, Second Quarter, 2011**

Medicines		Units available in the regional warehouses as of June 30, 2011	Availability in months, based on consumption	Stock-out during the preceding six- month period?
Treatment for <i>P. falciparum</i>	Artesunate 50 mg tabs.	28,052	78.0	No
	Artesunate 250 mg tabs.	12,882	19.0	No
	Mefloquine 250 mg tabs.	29,98	25.0	No
Treatment for <i>P. vivax</i>	Chloroquine phosphate 150 mg tabs.	1,028,531	19.0	No
	Primaquine phosphate 7.5 mg tabs.	421,811	20.0	No
	Primaquine phosphate 15 mg tabs.	922,624	19.0	No
Treatment for severe and special cases	Artesunate 60 mg amp.	280	10.0	No

Source: System for Quarterly Monitoring of Antimalarial Availability and Consumption (2011).

## Suriname

In 2008<sup>18</sup> the central medical store and the Medical Mission (Medische Zending; MZ) reported low stock levels of antimalarials, including ATM-LUM, throughout the country. Standard operating procedures to manage inventories (storage, requisition, and security stock) did not exist in the MZ clinics or the notification points of the malaria program in the gold-mining areas.

In Suriname, the Ministry of Health (MOH) oversees the Malaria Board (MB), which sets national policies and procedures with regard to all malaria issues in Suriname. The Bureau of Public Health (Bureau voor Openbare Gezondheidszorg; BOG) is the authority that oversees all malaria activities in the country. The Malaria Program (MP), with resources from Global Fund, administers the supply of medicines in the gold-mining region through its community case workers or notification points. The MZ oversees medicines in the country's network of health outposts and for village health workers.

The MP, MZ, and BOG are each responsible for calculating their own annual antimalarial supply and use because each organization has different focal areas in the country. All three organizations quantify their needs for pharmaceutical procurements based on historical data because of very low malaria incidence in the entire country. Each organization is responsible for reporting its data to BOG.

The MP, BOG, and MZ acquire medicines. Each organization currently carries out procurement separately using its own processes and set of procedures. The MP is responsible for procurement for the BOG and the MP while the central warehouse (Bedrijf Geneesmiddelen Voorziening, BGVS) is responsible for clearance of medicines. MZ still procures on its own. Suriname is working toward a consolidated purchasing system with each of the three agencies working jointly.

The MP and the BOG have procured most of their stock through PAHO/SF with resources provided by the Global Fund (for the MP) and the MOH (for BOG). The MZ procures medicines through the International Dispensary Association (IDA) or other prequalified WHO medicine distributor and follows its own procurement system and requirements.

BOG and MP medicines are stored at BGVS warehouses and recorded as separate stocks. There are some reports of delays, situations of low stock levels, and high prices for medicines purchased by this organization. However, because of the low incidence of malaria, these issues have not affected the availability of antimalarials in the country. Still, as a result many hospitals, clinics, pharmacies, and nongovernmental organizations acquire medicines directly from other providers outside the BGVS. Medicines procured by the MZ are stored in its own warehouses.

Each of the three organizations distributes medicines to different sectors of the country. The MP distributes medicines to the gold-mining regions of the country, which are scattered throughout the country's interior. Medicines are brought or sent by plane to a system of notification points on request. Gold miners are highly mobile because of the changing mine locations, so the

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<sup>18</sup> Barillas, Edgar, Claudia Valdez, and Silas Holland. 2008. *Situación de la gestión del suministro de medicamentos para el tratamiento de la malaria en los países que comparten la Cuenca Amazónica*.

notification points change when the camps move throughout the mining region of the country. The Malaria Service Deliverers (MSDs) have been trained in diagnosis of malaria with rapid diagnostic test and treatment. The MZ distributes medicines to the health posts in the interior of the country in villages where locals live. There have not been malaria cases in the interior outside the mining region in the last few years, but the MZ keeps a minimal stock on hand at each post for treatment in case of an outbreak. Accessibility in the interior and gold-mining regions of the country is difficult because roads are poor or nonexistent. Therefore, distribution of medicines is difficult and costly.

The availability of medicines in June 2011 in the BGVS for the MP and the BOG was an average of 87.53 months of availability (range 0 to 235 months). A stock-out was reported for two of the medicines, PQ 5 mg and AS 100 mg. No stock-outs were reported in the last six months (table 8). The country is overstocked in all of the medicines used to treat *P. vivax*. During the regional workshop in Lima, Peru, in August 2011, the country debated the causes of these stock problems. The reasons, according to participants, are the prolonged purchase process through international providers through PAHO/SF; lack of an integrated information system; absence of providers of medicines for special case treatments; small size of requested quantities (due to low incidence), so most suppliers are not interested; and difficulty of reaching certain regions, areas, or localities because of the remoteness of the interior.

**Identified problems:** Periodic stock-outs of various medicines for treatment of uncomplicated *P. falciparum* and *P. vivax* cases were found, which were attributable to the prolonged acquisition process through PAHO/SF and lack of providers for small quantities of medicines required. Deficiencies related to the distribution of antimalarials in zones with poor access. No criteria for the programming in low-incidence zones and no integrated information system that allows monitoring of malarial stocks.

**Short-term plans:** Participate in the consolidated purchase of medicines organized by the Strategic Fund/PAHO. Centralize antimalarial purchasing that is procured locally. Conclude the review of treatment protocols. Decrease the costs of distribution of medicines to the mining areas. Encourage more collaboration between the BGVS, BOG, MZ, and MP (see annex 1).

**Table 8. Suriname: Availability of Medicines in the BGVS for the Malaria Program and the BOG, Second Quarter, 2011**

Medicines	Units available in the central warehouse as of June 30, 2011	Availability in months, based on consumption	Stock-out during the preceding six-month period?	
Treatment for <i>P. falciparum</i>	Artemether-lumefantrine 20 mg + 120 mg c/6 tabs.	2,880	12.0	No
	Artemether-lumefantrine 20 mg + 120 mg c/12 tabs.	4,320	12.0	No
	Artemether-lumefantrine 20 mg + 120 mg c/18 tabs.	10,080	37.5	No
	Artemether-lumefantrine 20 mg + 120 mg c/24 tabs.	1,440	12.0	No
	Artesunate 50 mg tabs.	120,000	*	No
	Artesunate 100 mg tabs.	0	0.0	No
	Mefloquine 250 mg tabs.	3,450	3.0	No
Treatment for <i>P. vivax</i>	Chloroquine 150 mg tabs.	122,000	235.0	No
	Primaquine phosphate 5 mg tabs.	**	85.0	No
	Primaquine phosphate 15 mg tabs.	217,000	219.2	No
Treatment for severe and special cases	Artemether 80 mg/mL amp.	1,900	*	No
	Artesunate sodium bicarbonate 60 mg/1mL amp.	2,110	16.7	No

Source: Data reported by the NMCP in the Lima workshop (2011).

\*Consumption not reported.

\*\*Availability data not available for Primaquine 5mg tablet.

## Honduras

The preferred treatment for malaria caused by *P. vivax* and *P. falciparum* continues to be CQ and PQ over a seven-day period. For special cases or cases involving resistant strains of *P. falciparum*, the preferred treatment is S-P and Q. For 2011, medicines for treating special or severe cases were not included in the Basic List of Medicines.

The supply of antimalarials is integrated into the general medicine supply system, which is coordinated by the Medicine Supply Technical Unit (Unidad Técnica para el Suministro de Medicamentos; UTSM). Because of the lack of national providers and problems involving product quality, in 2010 some medicines, primarily second line, were obtained in the form of donations from PAHO/SF, while other antimalarials for treating uncomplicated cases were procured by means of direct purchases from national providers using funds from the national

budget. Ministry of Health administrative procedures are very involved, leading to delays in the procurement of antimalarials. The average wait time from placement of order to receipt of medicines is five months.

The information system on antimalarial supplies is integrated with that of other MOH medicines. The lack of human and technological resources (computerized systems) for consolidating information has rendered information on consumption and availability incomplete and untimely, with attendant interruptions in the supply chain.

Since 2008<sup>19</sup> difficulties in the supply of antimalarials have been reported in the Atlantic coast region owing to the remote location of health posts; in other regions, such as in the southern part of the country, evidence was found of expired medicines as a result of the low incidence of the disease reported in recent years.<sup>20</sup> In June 2011, the central warehouse did not report stock-outs of any antimalarials. However, in 2010 and the first quarter of 2011, stock-outs were reported for two months' for CQ. During the workshop held in Lima in August 2011, the causes for these stock-outs were discussed. According to participants, the reasons were lengthy processes for making purchases from local and international providers, failure to make appropriate adjustments in scheduling, and failure to properly project medicine use for mass radical treatments.

As of June 2011, the central warehouse showed a 100 percent availability of medicines for treating complicated and uncomplicated cases of malaria, as well as a significant oversupply of PQ 5 mg and 15 mg in tablet form, for which an availability of 66 and 53 months' supply, respectively, was recorded (table 9).

**Problems identified:** The Ministry has in place drawn-out administrative processes for making purchases. Only limited information is available to properly calculate medicine needs (regions do not report the application of mass radical treatments). Medicine management procedures are not standardized. There is limited availability of staff and funding for distributing medicines to geographically remote health facilities.

**Short-term plans:** Prepare a proposal to conduct medicine procurement procedures exclusively through PAHO/SF. Manage on a timely basis and take into account purchase lead times and delivery times in procurement procedures. Identify bottlenecks in purchasing and distribution to prevent stock-outs. Prepare and implement a manual to govern the management of antimalarial supply. Improve the system for antimalarial distribution and information, primarily in geographically isolated sites and areas with a high incidence of malaria (see annex 1).

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<sup>19</sup> Strengthening Pharmaceutical Systems Program (SPS). 2008. *Situación de la gestión del suministro de medicamentos para el tratamiento de la malaria en los países de Centroamérica*. Submitted to the US Agency for International Development by the SPS Program. Arlington, VA: Management Sciences for Health.

<sup>20</sup> Interviews with country representatives participating in the workshop held in Lima, Peru, 2011.

Table 9. Honduras: Availability of Medicines in the Central Warehouse, Second Quarter, 2011

Medicines		Units available in the central warehouse as of June 30, 2011	Availability in months, based on consumption	Stock-out during the preceding six-month period?
Treatment for <i>P. falciparum</i>	Sulfadoxine + pyrimethamine 500/25 mg tabs.	39,600	*	No
	Chloroquine phosphate 150 mg tabs.	327,350	5.1	No
Treatment for <i>P. vivax</i>	Primaquine phosphate 5 mg tabs.	2,755,400	66.4	No
	Primaquine phosphate 15 mg tabs.	2,222,172	53.4	No
Treatment for severe and special cases	Quinine 300 mg/ mL x 2 mL amp.	8,700	5.8	No
	Quinine 300 mg tabs.	1,470	*	No

Source: Data reported by the NMCP during the workshop in Lima (2011).

\*No consumption data were reported.

## Nicaragua

In late 2007, national health care protocols were updated in response to efficacy studies carried out earlier that year<sup>21</sup> that showed a 100 percent level of efficacy of CQ for treating *P. vivax* and *P. falciparum*. Use of S-P as a second-line regimen was included. Beginning in 2007, the Ministry of Health (Ministerio de Salud; MINSa) began to apply mass radical treatment for controlling foci and outbreaks.

Since 2008<sup>22</sup> Nicaragua has shown an ongoing stock-out of medicines for treating uncomplicated cases of malaria. Inventories of medicines used for special cases were reported at availability levels equal to less than one month's supply. This was caused by a failure to make adjustments in planning and a lack of local providers to supply medicines in small amounts. Despite a continuous supply of antimalarials throughout the entire public network, there was also evidence that PQ and CQ were being sold by private entities.

<sup>21</sup> Taller de selección, programación de necesidades y adquisición de medicamentos antimaláricos en los países que comparte la cuenca del Amazonas, Cartagena, Colombia, abril de 2010.

<sup>22</sup> Strengthening Pharmaceutical Systems Program (SPS). 2008. *Situación de la gestión del suministro de medicamentos para el tratamiento de la malaria en los países de Centroamérica.*

In July 2011, criteria were established for estimating the need for antimalarials in areas of low, medium, and high transmission (table 10). Because of inconsistencies in the procurement schedule, these criteria were not used for estimating purchase requirements for 2012.

The Directorate General for Medical Supplies (Dirección General de Insumos Médicos; DGIM) is responsible for making purchases of medicines and supplies as programmed for local health levels, and this agency coordinates procurement processes with the Disease Prevention Directorate (Dirección de Prevención de Enfermedades; DPE), a unit attached to MINSA's Directorate General for Health Monitoring.

Antimalarials are procured from local providers by means of public tenders, a process that takes between three and six months. The Government Procurement Law prohibits direct purchases from international providers. MINSA, as part of a long-term plan for 2012–2015, has launched a process for prequalifying local providers in accordance with PAHO certification criteria. Because of the decrease in malaria cases in recent years, local providers are essentially not interested in providing antimalarials for the treatment of special cases. In 2010, MINSA received a grant of antimalarial medicines through PAHO/SF for the treatment of special and severe cases (S-P and Q).

In 2010, problems were detected regarding the distribution of medicines in geographically remote areas, primarily in regions bordering Honduras (in the northeastern part of Nicaragua), which is where most cases of malaria are reported.

In June 2011, the NMCP reported a continuous supply of medicines for treating cases of *P. vivax* and *P. falciparum* malaria (CQ and PQ)<sup>23</sup> with availability recorded at levels of between 5.8 and 8.5 months' supply at the level of the Local Systems for Integral Health Care (Sistemas Locales de Atención Integral en Salud; SILAIS). At the central level, however, stock-outs of Q in ampoules and of PQ in all dosage presentations (table 11) were reported. During the workshop held in Lima in August 2011, the causes of these stock-outs were discussed. According to participants, the reasons involved a failure to make planning adjustments, deficiencies in the system for providing feedback of information on supply management, failure to include factors such as safety stock, the limited number of providers at the local level, and failure to take into account lead times required for purchase and delivery from providers during the 2010 purchase exercise.

**Problems identified:** A stock-out of medicines for treating special cases was reported because of the lack of providers in the local market. Difficulties arose in the consolidation process and in procedures for providing feedback on medicine consumption and availability in remote areas. There is no up-to-date set of regulations governing supply management that takes into account new criteria for estimating needs.

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<sup>23</sup> Interviews with NMCP representatives participating in the workshop held in Lima, Peru, 2011.



Table 10. Criteria for Calculating Needs Based on Risk Strata

Level of resolution and storage	Low risk		Medium risk	High Risk
	Medicine	Minimum stock criteria	Minimum stock criteria	Stock criteria
CIPS		One year storage for 500 treatments; must have reagents, gloves, alcohol, etc.		
SILAIS	Chloroquine 250 mg Primaquine 5 mg Primaquine 15 mg Quinine Clindamycin	Stock for SILAIS must be sufficient for 2 treatments of severe cases in adults and 2 in children.  In the case of radical treatment, SILAIS must have 4 treatments for each ESAFC and 1 for each Col-Vol. In addition, it must have 50 radical treatments for an outbreak caused by a natural or other disaster.	Stock for SILAIS must be sufficient for 2 treatments of severe cases in adults and 2 in children.  In the case of radical treatment, SILAIS must have 4 treatments for each ESAFC and 1 for each Col-Vol. In addition, it must have 50 radical treatments for an outbreak caused by a natural or other disaster.	Stock for SILAIS must be sufficient for 5 treatments of severe cases in adults and 5 in children.  In addition, it must have 5 radical treatments for each Health Unit and 2 treatments for each Col-Vol.  It must also have 300 radical treatments for use in the event of outbreaks (natural or other disasters).
Hospitals	Chloroquine 250 mg Primaquine 5 mg Primaquine 15 mg Quinine 300 mg/mL	Each departmental hospital must have 3 treatments for serious cases involving adults and 2 for children. National referral hospitals must have 3 treatments for severe cases in adults and 3 in children. For radical treatment, hospitals must have 2 treatments for adults for each health unit, and 2 treatments for children for each health unit.		Primary hospitals and hospitals located in special areas must have 7 treatments for serious cases involving adults and 7 treatments for children. For radical treatment, they must have on hand 14 treatments for adults and 16 treatments for children for each health unit.

*Status of Antimalarial Supply Management in Countries of the Amazon Basin and Central America,  
October 2011*

Health Centers	Chloroquine 250 mg Primaquine 5 mg Primaquine 15 mg	Municipalities with no cases of malaria must have 4 radical treatments for adults and 4 for children for each Health Center.	In municipalities that have cases of malaria and that are at medium risk, each Health Center must have 5 radical treatments for each case presenting during the preceding year.  In Special Areas, they must have 10 treatments for each positive case of malaria.	Municipalities that have cases of malaria and that are at high risk must have on hand 30 radical treatments for each positive case seen during the preceding year.
Health Posts	Chloroquine 250 mg Primaquine 5 mg Primaquine 15 mg	For each ESAFC there must be 4 radical treatments for adults and 4 treatments for children.	At the medium-risk level, there must be 7 radical treatments for adults and 3 for children for each Health Post.	At the high-risk level, there must be 14 radical treatments for adults and 6 for children for each Health Post.
Collaborators-Volunteers (Col-Vols)	Chloroquine 250 mg Primaquine 5 mg Primaquine 15 mg	In low-risk towns, Col-Vols must have 2 radical treatments each for adults and 2 radical treatments for children.	In towns at medium risk, Col-Vols must have 5 radical treatments for adults and 5 for children.	In towns at high risk, Col-Vols must have at least 15 radical treatments for adults and 5 for children.

\* Data provided during the workshop held in Lima, Peru (August 2011).

Table 11. Nicaragua: Availability of Medicines in the Central Warehouse and Health Units, Second Quarter, 2011

Medicines	Units available in the central warehouse as of June 30, 2011	Availability in months, based on consumption	Network inventory (MINSAs health units)	Availability in months based on consumption (Health Units)	Stock-out during the preceding six-month period?	
Treatment for <i>P. falciparum</i>	Sulfadoxine-pyrimethamine 500/25 mg tabs.	85*	*		No	
Treatment for <i>P. vivax</i>	Chloroquine phosphate 150 mg tabs.	154,793	1.16	976,564	8.50	No
	Primaquine phosphate 5 mg tabs.	0	0.00	479,732	6.00	No
	Primaquine phosphate 15 mg tabs.	0	0.00	525,279	5.80	No
Treatment for severe and special cases	Quinine 300 mg/mL x 2 mL amp.	0	0,00	0	0.00	Yes
	Quinine 300 mg tabs.	140	*	0	0.00	No

Source: Data reported by the NMCP at the workshop held in Lima (2011).

\*Consumption data not reported.

**Short-term plans:** Monitor and evaluate the process for procuring and distributing antimalarials on all levels. Request a donation of medicines for treatment of patients with resistant strains of *P. falciparum*. Review and update national malaria guidelines. Improve feedback of information on supply management among MINSAs, the DGIM, and the DPE. Implement recommendations of the study on the status of the supply of antimalarials and other tracer medicines in accordance with the protocol prepared with technical assistance provided by MSH/SPS (see annex 1).



## ANALYSIS AND DISCUSSION OF THE STATUS OF ANTIMALARIAL SUPPLY

The individual country analysis indicates that problems involving the supply of antimalarials in the region are attributable to the following:

- The low level of the incidence of malaria in most countries. This has limited the commercial interest of pharmaceutical laboratories in participating in national tender proceedings, particularly for medicines with a low volume of consumption, such as those used to treat severe and special cases.
- The concentration of the malaria epidemic in population groups residing or working in remote areas, such as chestnut gatherers (in Bolivia) and artisanal miners (along the Brazil/Guyana/Suriname border).
- The decentralization of public administration and the integration, in some countries, of supply systems. This has led to a situation where vertical malarial control programs have lost their decision-making authority over the organization of their response to the epidemic.
- The wide range of treatment regimens in the region for *P. falciparum*, even without documented evidence of differences in the efficacy of the primary therapeutic alternatives available in the market (particularly ATM-LUM as compared to AS-MQ). This hampers the coordination of consolidated purchasing and the exchange of medicines among countries (see annex 3).

In response to this situation, two USAID-financed MSH projects (RPM Plus and SPS), together with other AMI partners, have provided technical assistance in two areas:

- Technical assistance to address country-specific problems, such as guidelines for treatment and medicine supply, training in supply chain management, and support to national supervision systems.
- Support for regional initiatives, for example, the system for monitoring the availability of antimalarials and the joint purchase of medicines through the PAHO/SF.

These initiatives are responsible for the improvement recorded by AMI member countries and recently affiliated countries of Central America in the status of antimalarial supply since 2008, the year in which MSH/SPS conducted its baseline assessment. Recent technical reports highlight these achievements: the system for monitoring the availability of antimalarials at the regional level shows a trend toward normalization of inventories of antimalarials, at least in central and regional warehouses,<sup>24</sup> and a recent study conducted by AMI provides evidence that

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<sup>24</sup> Marmion, John, and Henry Espinoza 2011. *Análisis de la disponibilidad de medicamentos antimaláricos en países de la cuenca del Amazonas: tercer trimestre 2011*.

“early treatment with antimalarials” satisfactorily fulfills more criteria for making appropriate adjustments to international standards than do other malaria control strategies.<sup>25</sup>

To a large extent, some supply crises have been avoided by virtue of the fact that dissemination of information on medicine availability in the countries evaluated has made possible bilateral donations coordinated by the PAHO/SF (see annex 2). Despite the encouraging results, stocks currently available (the mentioned trend toward normalization) prevent this from being an ongoing supply mechanism.

The data presented in the analysis of the situation in individual countries show, however, that significant problems still remain and that these problems lead to periods of stock-out in a number of countries. Common causes for these problems include the following:

- The ordering criteria used by countries do not take into account the following:
  - Actual wait times for national purchases (conservatively, from 6 to 8 months) as well as for those made through the PAHO/SF (8 to 12 months)
  - The supply of medicines in areas of low incidence but at persistent risk of outbreaks
  - Safety stock to anticipate problems involving purchasing and distribution to geographically isolated sites
- Lack of standardization and/or compliance with medicine supply procedures, particularly in systems transitioning toward malaria program decentralization or supply system integration.
- The lack of information systems (either vertical or integrated) to provide information on antimalarial consumption and inventories at all points along the supply chain.
- Lack of access to antimalarial treatment by population groups residing in geographically remote areas and by those working in special conditions.

As malarial control progresses toward advanced stages (preelimination), timely treatment with appropriate medicines becomes the basic means of control (and eventual elimination). In addition, transition toward preelimination is not feasible while countries that have successfully reduced incidence share borders with countries where the burden is heavy, or where countries of low transmission include population groups with no access to means of control.

Based on the analysis of the supply problems at the level of each individual country as well as at the transnational level, AMI partners have proposed that support be provided for the implementation of work plans in AMI member countries (annex 1) and that regional interventions continue to receive strengthening, particularly the following:

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<sup>25</sup>Flores, W. 2011. *Impacto del tratamiento combinado con artemisinina para la malaria en diferentes países y las implicaciones para los países de la cuenca del Amazonas: Reporte final*. Submitted to the US Agency for International Development by the Strengthening Pharmaceutical Systems (SPS) Program. Arlington, VA: Management Sciences for Health.

- Monitoring of the availability of antimalarials in the region
- Joint purchase of antimalarials through the PAHO/SF
- Increase in the access to means of control by groups living and working in special conditions
- Alignment of control strategies with the decentralization of public administration and program integration





## ANNEX 1: SHORT- AND LONG-TERM WORK PLANS, BY COUNTRY

### Bolivia

INTERVENCIÓN	MEDIANO PLAZO (2011–12)			LARGO PLAZO (2012–15)		
	TAREAS ESPECÍFICAS	RECURSOS Y FUENTES	RESPONSABLE	TAREAS ESPECÍFICAS	RECURSOS Y FUENTES	RESPONSABLE
<b>Revisión de esquemas y selección de medicamentos y presentaciones</b>						
Participar en la compra conjunta una vez sea consolidada				Participar en la compra conjunta y llenar formularios de requerimiento	Tesoro General de la Nación (TGN)	Programa de Malaria Mary Caiguara
Solicitud a LINAME de inclusión de Coartem	Elaboración de solicitud y justificativo		Programa de Malaria Mary Caiguara			
Solicitud de cotización de Coartem a la OPS	Enviar el lunes 15 de agosto de 2011 a primera hora la solicitud a la OPS		Programa de Malaria Mary Caiguara			
Coordinar la nueva donación de AS-MQ con Farmanguinhos	Comunicación con Daniel Mechalli de DNDi 15 de agosto de 2011		OPS Arletta Añez			
Confirmar la precalificación de Farmanguinhos				Comunicación con Nora Girón hasta Agosto 2012		Arletta Añez
<b>Programación de necesidades</b>						
Elaborar la programación de necesidades hasta el primer nivel para zonas baja incidencia	Identificar el número de establecimientos de salud por municipio. Evaluar la epidemiología de la zona.  Taller de capacitación SNUS, SALMI, SIAI y de programación de medicamentos en situaciones de baja incidencia para mejorar la disponibilidad.	Recursos AMI, OPS/OMS	Programa de malaria Mary Caiguara, Magdalena Jiménez, MSH, regionales			
<b>Adquisición y distribución</b>						
Mejorar la distribución de medicamentos	Redistribuir los medicamentos de <i>P. falciparum</i> a los establecimientos y capacitar a los regionales.	TGN	OPS/MSH Programa de Malaria			
Mejorar las notas de entrega de medicamentos	Monitorear la consolidación del sistema manual de la gestión de medicamentos. Difundir e implementar la Tarjeta de Gestión del Suministro a nivel local.		Programa de Malaria, Mary Caiguara			

## Brazil

INTERVENCIÓN	MEDIANO PLAZO			LARGO PLAZO (2012–15)		
	TAREAS ESPECÍFICAS	RECURSOS Y FUENTES	RESPONSABLE	TAREAS ESPECÍFICAS	RECURSOS Y FUENTES	RESPONSABLE
<b>Revisión de esquemas y selección de medicamentos y presentaciones</b>						
Estudo de eficácia da 1ª linha de tratamento para <i>P. falciparum</i> - artemeter-Humefantrina em Manaus e artesunato+ mefloquina no Acre.	Resultados dos estudos.	PNCM e RAVREDA	FMT e FIOCRUZ (Acre)	Monitoramento da eficácia		PNCM
Inclusão da primaquina nos tratamentos de primeira linha para <i>P. falciparum</i>	Publicação do guia de tratamento no 2º semestre	PNCM e RAVREDA	CGPNCM			
Esquemas de tratamento foram revisados em 2009 e estão sendo utilizados conforme o guia prático de tratamento de malária - 2010	A cada ano, a câmara técnica de tratamento de malária se reúne pelo menos uma vez ao ano para definir as drogas e	Orçamento do Governo federal  Repasado ao Ministério da saúde.	CGPNCM	Revisar o guia prático a cada 4 anos, ou conforme a necessidade	Orçamento do Governo federal  Repasado ao Ministério da Saúde.	CGPNCM
Implementar o coblister (cloroquina e primaquina) para o tratamento da <i>P. vivax</i> . Planejado para iniciar no segundo semestre de 2011	*Novo revestimento para *Nova embalagem/protótipo. *Estudo de eficácia em Rondônia	PNCM, RAVREDA e farmanguinhos		Quando aprovado, implantar o coblister		PNCM
Novo tratamento: act para tratamento de malária por <i>P. vivax</i>	Estudos em 2012	PNCM e RAVREDA				
Alteração na concentração/apresentação do dicloridrato de quinina injetável -125 mg/ml, 4 ml	Aquisição do dicloridrato de quinina 300 mg/ml- 2 ml por compra fe/opas.		MS E OPAS			
Facilitar a compra conjunta por meio fe/opas.						
<b>Programación de necesidades</b>						
Reunião sobre gestão de medicamentos – 2º semestre 2012	*Preparar pauta da reunião * Definir público alvo * Ter a participação do MSH.		CGPNCM	Reunião 2º semestre 2012		CGPNCM
Programação de medicamentos no início do 1º semestre.	* Ter a programação anual dos estados. * Preparar trs para aquisição		CGPNCM			
<b>Adquisición y distribución</b>						
Reuniões DAF e OPAS	Discussões sobre avanços das reuniões no 1º semestre 2011		DAF			
Monitoramento dos processos de aquisição	Reuniões periódicas para avaliação do andamento da aquisição.		DAF			
Guia de gestão de medicamentos	Atualização do guia de gestão de medicamentos e guia prático para nível local.	MSH	PNCM	Publicação do guia		

## Colombia

INTERVENCIÓN	MEDIANO PLAZO (2011–12)			LARGO PLAZO (2012–15)		
	TAREAS ESPECÍFICAS	RECURSOS Y FUENTES	RESPONSABLE	TAREAS ESPECÍFICAS	RECURSOS Y FUENTES	RESPONSABLE
<b>Revisión de esquemas y selección de medicamentos y presentación</b>						
Difusión de la guía de atención clínica de malaria en los departamentos prioritarios	<ul style="list-style-type: none"> <li>- Talleres de asistencia técnica</li> <li>- Video conferencias y sesiones virtuales en departamentos prioritarios</li> <li>- Suministro de material impreso como guías de bolsillos</li> </ul>	<ul style="list-style-type: none"> <li>- Marco del proyecto del Fondo mundial</li> <li>- Marco de convenio MPS-OPS/OMS</li> </ul>	<ul style="list-style-type: none"> <li>- MPS-Proyecto malaria Colombia-Fondo Mundial</li> </ul>			
Seguimiento de adherencia a la guía	<ul style="list-style-type: none"> <li>- Visitas de asistencia técnica</li> <li>- Elaboración de protocolo de estudio para monitorear la implementación de la guía de atención clínica de la malaria</li> </ul>	<ul style="list-style-type: none"> <li>- Programas ETV</li> <li>- Marco del convenio MPS-OPS/OMS</li> <li>- MSH apoyo a la elaboración de protocolo de estudio</li> </ul>	<ul style="list-style-type: none"> <li>- MPS</li> <li>- Secretarías Departamentales (UPGD)</li> <li>- INS</li> <li>- MSH puede apoyar la elaboración de protocolos de estudio de adherencia</li> </ul>			
<b>Programación de necesidades</b>						
Revisar con el INS mecanismos para el control de calidad y validez de la información de casos	Análisis de casos reportados por el SIVIGILA vs consumo de antimaláricos por el almacén central y almacenes regionales	<ul style="list-style-type: none"> <li>- MPS</li> <li>- Actividad que está siendo apoyada por MSH</li> </ul>	<ul style="list-style-type: none"> <li>- INS – MPS</li> <li>- MSH puede apoyar esta actividad</li> </ul>			
Continuar con el fortalecimiento de la gestión de inventarios en el nivel central y departamentos prioritarios	Definir los criterios de las reservas de seguridad y de pérdida tanto en el nivel central	<ul style="list-style-type: none"> <li>- MPS</li> <li>- OPS</li> <li>- MSH</li> </ul>	<ul style="list-style-type: none"> <li>- MPS: Almacenista y QF</li> <li>- Actividad que está siendo apoyada por OPS/OMS y</li> </ul>			
	Apoyar a los departamentos prioritarios en la definición de los criterios de la reserva de seguridad y porcentaje de pérdida					
	Ajustar el instrumento de programación de necesidades del nivel central y documentar el procedimiento de programación					
	Solicitar indicadores de almacén sobre disponibilidad y consumo de antimaláricos cada trimestre a los departamentos prioritarios para malaria en Colombia	<ul style="list-style-type: none"> <li>- MPS</li> </ul>	<ul style="list-style-type: none"> <li>- MPS: Almacenista y QF</li> <li>- Actividad que está siendo apoyada por MSH</li> </ul>			
	Elaborar informe sobre disponibilidad de antimaláricos en Colombia cada trimestre	<ul style="list-style-type: none"> <li>- MPS</li> </ul>	<ul style="list-style-type: none"> <li>- MPS: Almacenista y QF</li> <li>- Actividad que está siendo apoyada por MSH</li> </ul>			
<b>Adquisición y distribución</b>						
Continuar con la articulación entre MPS, INS, OPS y MSH para el fortalecimiento de la cooperación técnica	Definir y documentar la compra o no de los medicamentos: clindamicina y doxiciclina con cargo a los recursos del MPS	MPS – INS – OPS - MSH	MPS			
	Reuniones de seguimiento a la asistencia técnica en el marco de AM/RAVREDA	<ul style="list-style-type: none"> <li>- MPS</li> <li>- OPS/OMS</li> <li>- MSH</li> </ul>	<ul style="list-style-type: none"> <li>- MPS</li> <li>- Programa ETV</li> </ul>			

## Ecuador

INTERVENCIÓN	MEDIANO PLAZO (2011–12)			LARGO PLAZO (2012–15)		
	TAREAS ESPECÍFICAS	RECURSOS Y FUENTES	RESPONSABLE	TAREAS ESPECÍFICAS	RECURSOS Y FUENTES	RESPONSABLE
<b>Revisión de esquemas y selección de medicamentos y presentaciones</b>						
Implementación de la nueva terapéutica antimalárica	Oficialización acuerdo ministerial (En trámite)	SNEM	SNEM			
	Capacitación personal médico y de apoyo (Agosto a diciembre 2011)	SNEM	SNEM			
	Actualizar y difundir una guía de manejo de malaria grave (hasta febrero 2012)	SNEM- AMI RAVREDA	SNEM MSP			
<b>Programación de necesidades</b>						
Estimación de Requerimientos	Cálculos de necesidades según normativa local (ya realizado)	SNEM	SNEM			
Evaluación de la implementación de criterios de programación y distribución de antimalaricos en baja incidencia	Estudio de impacto de los criterios de programación y distribución de antimalaricos en Ecuador	SNEM y MSH	SNEM y MSH			
<b>Adquisición y distribución</b>						
Suministro de medicamentos	Inicio proceso de adquisición por intermedio OPS (En proceso)	SNEM	SNEM			
	Provisión a unidades de Salud según normativa vigente (diciembre 2011)					

**Annex 1: Work Plans**

**Guyana**

INTERVENTION	MEDIUM TERM (2011–12)			LONG TERM (2012–15)		
	SPECIFIC TASKS	FUNDS AND SOURCES	RESPONSIBLE PARTY	SPECIFIC TASKS	FUNDS AND SOURCES	RESPONSIBLE PARTY
<b>Selection of medicines and forms</b>						
Roll out of new standard treatment guidelines (due for finalization & printing, Q3. 2011).	Conduct training and implement new antimalarials treatment guidelines in all regions	MOH/PAHO/GF	MOH	Monitor the use of antimalarials treatment guidelines	MOH/PAHO/GF	MOH
Roll out of new Drug supply SOP	Conduct training and implement new antimalarials Drug supply SOP in all regions	MOH/PAHO/GF	MOH	Monitor the use and accessibility of antimalarials drugs Continue re- training sessions	MOH/PAHO/GF	MOH
Alternative generic drug	- Get registration for new drug	MOH	MOH			
<b>Planning of needs</b>						
Strengthening of network to link pharmacist and malaria supervisor for the supply chain system	Minimum of two performance improvement meetings per year. Conduct field visits for drug supply assessment. Create a report form for reporting from malaria supervisor to pharmacist Aggregation, reporting and analysis of data obtained from Supervision "tool"	MOH/MSH	MOH	Follow up through direct and indirect supervision	MOH/MSH	MOH
	Strengthening of Malaria Information System					
Improve the forecasting of Anti Malarials	- Conduct bi-annual quantification based on morbidity data from VCS.	MOH/ USG(SCMS)	MOH/SCMS	Monitor and evaluate historical data and performance	MOH/SCMS	MOH/SCMS
<b>Acquisition and distribution</b>						
Streamline of VPP procurement procedures between MOH/Guyana, PAHO/Guyana & PAHO/DC.	- Timely submission of needs based on Lead times. - Review and link processes for PAHO and MOH	MOH/PAHO	MOH/PAHO	Agreement on responsibilities of both parties.	MOH/PAHO	MOH/PAHO
Develop contingency plan for supplies	- Select more than one potential supplier - Establish alternatives (Generic) as a back up.	MOH	MOH			
Improve supply chain management in the regions	- Completion of the LMIS roll out - Set targets for the regions	MOH/USG (SCMS)/PAHO/AMI?	MOH/USAID	- Conduct training in supply chain for regional	MOH/USG (SCMS)/PAHO/AMI?	MOH/USAID

## Honduras

INTERVENCIÓN	MEDIANO PLAZO (2011–12)			LARGO PLAZO (2012–15)		
	TAREAS ESPECÍFICAS	RECURSOS Y FUENTES	RESPONSABLE	TAREAS ESPECÍFICAS	RECURSOS Y FUENTES	RESPONSABLE
<b>Revisión de esquemas y selección de medicamentos y presentaciones</b>						
Aplicación de la norma de malaria	Capacitación a los equipos departamentales de salud	Fondos Nacionales	Programa de malaria (PNM)	Monitoreo de la aplicación de la norma	Fondos nacionales	PNM y la dirección de promoción
Solicitud de la inclusión al cuadro básico nacional de los antimalaricos según nueva norma	Envío de la solicitud oficial a la UTSM	Fondos nacionales, OPS	UTSM Y PNM, secretario de salud	-Elaboración de manual de procedimientos para la gestión de antimalaricos -Actualización de la norma de malaria	-Gestión de fondos -Conformación de un equipo técnico -Proceso de elaboración -Diseño e impresión -Socialización	UTSM OPS Dirección de promoción Dirección de regulación sanitaria PNM Dirección de vigilancia de la salud
<b>Programación de necesidades</b>						
Gestión de antimalaricos	Planificación de necesidades	Fondos nacionales	PNM	Capacitación para planificación de necesidades	Definición del stock de antimaláricos por niveles Definición de necesidades por perfil epidemiológico y por consumo histórico Levantamiento periódicos de inventarios	UTSM, OPS, PNM
<b>Adquisición y distribución</b>						
Solicitud de donación de cloroquina 150 mg/tb	Identificación y solicitud a países donantes	Fondos nacionales, AMI RAVREDA	AMI/RAVREDA, MSH, OPS, PNM	Plan de gestión para asegurar la calidad de los antimalaricos	Fondos nacionales	PNM, Dirección de regulación sanitaria, OPS, lab. oficial
Mejorar la planificación para la distribución oportuna	Identificar los cuellos de botella para evitar el desabastecimiento	Fondos nacionales	PNM, UTSM			
Definir que el proceso de compra solo sea a través de OPS	Plantear la justificación de la propuesta al nivel de secretario	Fondos nacionales	PNM, gerencia administrativa			
Abastecimiento oportuno de medicamentos	Plan de distribución para las Unidades de Salud de alta incidencia	Fondos nacionales	PNM			

## Nicaragua

INTERVENCIÓN	MEDIANO PLAZO (2011–12)			LARGO PLAZO (2012–15)		
	TAREAS ESPECÍFICAS	RECURSOS Y FUENTES	RESPONSABLES	TAREAS ESPECÍFICAS	RECURSOS Y FUENTES	RESPONSABLE
<b>Revisión de esquemas y selección de medicamentos y presentaciones</b>						
Revisión y actualización de la norma nacional de malaria	Sesiones de trabajo equipo DPE-DGIM, DGIM-OPS-Nicasalud	Fondo Mundial Recursos de MINSA – OPS y Nicasalud	MINSAs - DPE			
	Reunión de trabajo para presentación y revisión y ajustes finales a la norma nacional	Fondo Mundial	MINSAs - DPE			
	Presentación de la norma ante la oficina de Regulación y normas del MINSA	Propios del MINSA	MINSAs - DPE			
	Dirección de Regulación envió la norma ante el MIFIC para su aprobación	Propios del MINSA	MINSAs (dirección de regulación)			
	Aprobación por parte de la oficina de Regulación MIFIC	fondos propios	MIFIC			
	Contratación de empresa para la reproducción de la norma	Fondo Mundial	NicaSalud			
	Distribución de normas según SILAIS y municipios	MINSAs	MINSAs DPE			
<b>Programación de necesidades</b>						
Establecer coordinación DGIM–DPE para estimación de necesidades de compra de antimaláricos	Reuniones trimestrales para revisión y análisis de necesidades y distribución de los antimaláricos	Fondos propios	DPE - DGIM			
	Compartir al DGIM, el comportamiento mensual de la situación epidemiológica de la malaria a nivel de país, SILAIS y municipal	Fondos propios	DPE - DGIM			
Mejorar la retroalimentación de la gestión del suministro de los antimaláricos entre MINSA DPE-DGIM	Establecer sesiones de monitoreo y evaluación del movimiento de los antimaláricos	Fondos propios	DPE - DGIM			
Estudio para el diagnóstico de la gestión, suministros, abastecimiento de medicamentos antimaláricos y otros medicamentos trazadores	Contratación de consultoría para el estudio	MSH/Fondo mundial	DPE			
<b>Adquisición y distribución</b>						
Monitoreo y evaluación del proceso de adquisición y distribución de los antimaláricos a todos los niveles	Establecer sesiones de trabajo del seguimiento de la adquisición y distribución de los antimaláricos	Fondos propios / Fondo Mundial	DPE - DGIM			
Redistribución de medicamentos en casos de emergencias	Coordinación DGIM e intersilais para reprogramar medicamento en casos necesarios o de emergencias	Fondos propios	DPE			
Reprogramación de medicamentos en casos de atención a pacientes <i>Falciparum</i> resistente	Coordinación interpaíses para solicitar apoyo en dosis según esquema necesario	Fondos propios / OPS	DPE			

## Peru

INTERVENCIÓN	MEDIANO PLAZO (2011–12)			LARGO PLAZO (2012–15)		
	TAREAS ESPECÍFICAS	RECURSOS Y FUENTES	RESPONSABLE	TAREAS ESPECÍFICAS	RECURSOS Y FUENTES	RESPONSABLE
<b>Revisión de esquemas y selección de medicamentos y presentaciones</b>						
Actualización y difusión de norma técnica	Actualización de norma técnica en taller de expertos	Tesoro público AMI	ESNPCEM	Asistencia técnica y monitoreo a las regiones	Tesoro público AMI	ESNPCEM
	Publicación de norma técnica en la página web, reproducción y distribución	Tesoro público AMI	ESNPCEM	Implementación de la norma técnica en las regiones	Tesoro público AMI	ESNPCEM
	Reuniones macro regionales para socializar la norma técnica	Tesoro público AMI	ESNPCEM	Talleres de capacitación en regiones	Tesoro público AMI	ESNPCEM
	Diseño y difusión de material de soporte a la prescripción e instructivo para usuarios	Tesoro público AMI	ESNPCEM			
<b>Programación de necesidades</b>						
Control de calidad de la información de consumo integrado (ICI) que emiten los establecimientos de salud	Cruce de información emitida por EESS con stock físico	Tesoro público	DIRESA	Difusión, monitoreo y supervisión en regiones	Tesoro público AMI	DARES
						DIGEMID
						ESNPCEM
Actualización y socialización de criterios de programación	Reunión de expertos	Tesoro público AMI	ESNPCEM			
Actualizar el aplicativo informático para la estimación presupuestal anual	Actualizar el módulo SIGA PpR	Tesoro público AMI	ESNPCEM OGPP			
Programación de productos farmacéuticos y dispositivos médicos utilizados en la atención de ESNPCEM para el abastecimiento nacional	Capacitación en programación y ejecución en el marco del PpR	Tesoro público OPS	DARES DIGEMID ESNPCEM			
<b>Adquisición y distribución</b>						
Ejecución de procesos de adquisición para el abastecimiento nacional	Procesos de adquisición	Tesoro público	DARES	Monitoreo del cumplimiento de indicador de disponibilidad	Tesoro público AMI	DARES
						DIGEMID
						ESNPCEM
Determinar criterios para el abastecimiento de medicamentos en áreas de baja y alta transmisión	Taller	Tesoro público AMI	ESNPCEM DARES DIGEMID	Concluir con la selección e implementación de subalmacenes intermedios para garantizar las BPA	Tesoro público AMI	DIGEMID ESNPCEM



**Suriname**

INTERVENTION	MEDIUM TERM (2011–12)			LONG TERM (2012-15)		
	SPECIFIC TASKS	FUND AND SOURCES	RESPONSIBLE PARTY	SPECIFIC TASKS	FUND AND SOURCES	RESPONSIBLE PARTY
<b>Review of regimens and selection of medicines and forms</b>						
Review national treatment guideline	Revision of national treatment protocol	Expert time/printing/AMI/Ravreda	Malaria Board (MB)			
	Efficacy studies	Expert time/printing/AMI/Ravreda	Malaria Board (MB)			
<b>Planning of needs</b>						
To integrate information systems for anti-malarials stock monitoring	Develop & maintain centralized reporting structures	Expert time/printing/AMI/Ravreda	MoH/M&E of PEU's			
<b>Acquisition and distribution</b>						
Procurement of anti-malarials in a timely manner	Clustering of the needs of the different organizations	Expert time	MoH/Medical Mission/PEU/BOG			
	To centralize procurement	Expert time	MoH/BGVS/Medical Mission/PEU/BOG			
	Regional clustering of the needs for anti-malarials (Strategic fund)	Expert time	MoH/PAHO			
				Regulatory documentation & Prequalification	Expert time	National Regulatory Authority
Low distribution costs in gold mining areas				To MOU's with gold mining companies regarding logistics		

## **ANNEX 2: SYSTEM FOR MONITORING MEDICINE AVAILABILITY: EXCHANGES AND DONATIONS WITHIN THE REGION**

Based on the information reported during the period since 2008, and in view of the ongoing stock-outs and excess stock of a number of medicines in many of the countries of the region, in 2009 MSH began implementing a system for monitoring on a quarterly basis stock levels and medicine availability in AMI member countries. Using this system, one can access information that will provide an early warning of a potential medicine stock-out, avoid interruptions in the supply chain, and facilitate the redistribution of excess medicines within and between affiliated countries. The first round of data gathering took place in September 2009, and the data collected provided information to enable the initial exchange/donation of medicines to take place while at the same time providing information serving to prepare requirements for 2010 and 2011.

Exchanges and donations among countries have contributed to improving the availability of a number of antimalarials—particularly those used for severe and special cases in countries of the region during the first two quarters of 2011—and avoid prolonged stock-outs.

To date, there have been 17 exchanges/donations between countries, 24 donations from PAHO/Amazon Network for Monitoring Antimalarial Resistance (RAVREDA), and 12 interdepartmental exchanges. Countries donated ATM-LUM in all four dosage presentations for treating *P. falciparum*, CQ and PQ for treating *P. vivax*, and four different medicines for severe cases and second-line regimens. The total value of the antimalarials donated and exchanged was approximately USD 53,498 based on PAHO/SF unit prices (2010) and the MSH *Drug Price Indicator Guide* (table 12, figure 2).

Annex 2: System for Monitoring Medicine Availability

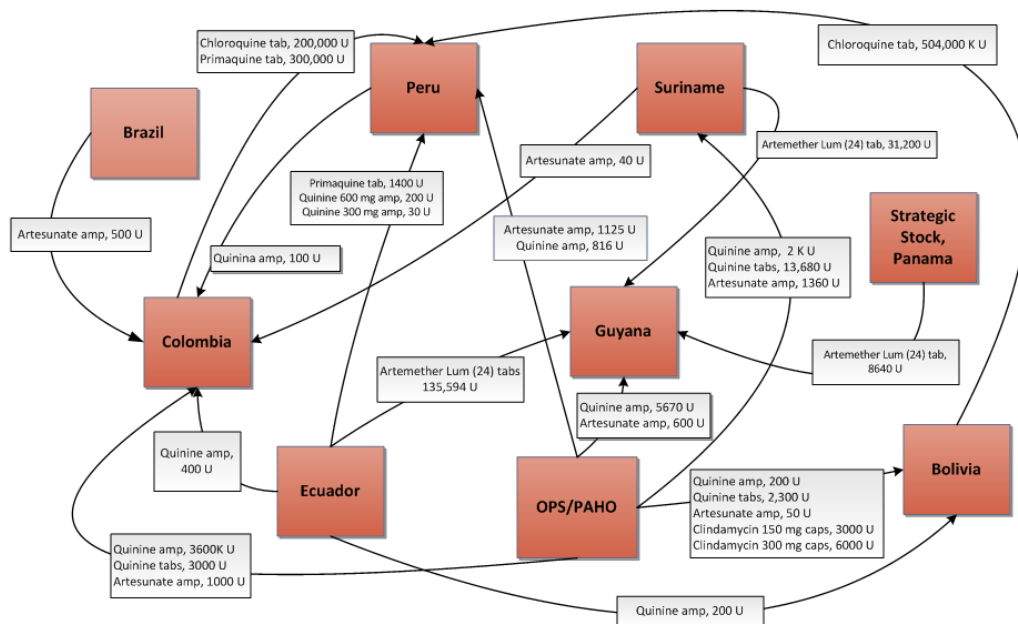
Table 12. Exchanges of Medicines between Countries of the Region since 2010

Transferencias País-País							
Fecha	Medicamento	Presentación	Donante	Receptor	Cantidad	Precio/Unidad	Valor (\$)
sep-09	Quinina Diclorhidrato 300 mg/ml	Ampolla	Perú	Colombia	100	0.117	11.67 (**)
dic-09	Cloroquina 150 mg	Tableta	Colombia	Perú	200,000	0.009	1,860.00 (*)
dic-09	Primaquina 15mg	Tableta	Colombia	Perú	300,000	0.010	2,850.00 (*)
may-10	Artesunato IV	Ampolla	Brasil	Colombia	500	2.000	1,000.00 (*)
may-10	Artesunato IV	Ampolla	Suriname	Colombia	40	2.000	80.00 (*)
ago-10	Artemether-Lumefantrine (24)	Tableta	Pamafro	Colombia	229,680	0.054	12,448.66 (*)
ago-10	Artemether-Lumefantrine (18)	Tableta	Pamafro	Colombia	37,260	0.060	2,235.60 (*)
ago-10	Artemether-Lumefantrine (12)	Tableta	Pamafro	Colombia	24,840	0.053	1,321.49 (*)
ago-10	Artemether-Lumefantrine (6)	Tableta	Pamafro	Colombia	12,420	0.060	745.20 (*)
sep-10	Cloroquina 150 mg	Tableta	Bolivia	Perú	504,000	0.009	4,687.20 (*)
dic-10	Primaquina Fosfato 15mg	Tableta	Ecuador, Zone VII, El Oro	Perú	1,400	0.010	13.30 (*)
feb-11	Artemether-Lumefantrine (24)	Tableta	Suriname	Guyana	31,200	0.054	1,691.04 (*)
abr-11	Artemether-Lumefantrine (24)	Tableta	Ecuador	Guyana	135,594	0.054	7,349.19 (*)
abr-11	Quinina Clorhidrato 600mg	Ampolla	Ecuador	Bolivia	200	0.094	18.74 (**)
abr-11	Quinina Clorhidrato 600mg	Ampolla	Ecuador	Colombia	400	0.094	37.48 (**)
abr-11	Quinina Clorhidrato 600mg	Ampolla	Ecuador	Perú	200	0.094	18.74 (**)
jul-11	Quinina Clorhidrato 300mg	Ampolla	Ecuador	Perú	30	0.286	8.58 (*)
<b>TOTAL</b>					<b>1,503,864</b>		<b>\$ 36,376.89</b>
Préstamos desde stock Panamá							
Fecha	Medicamento	Presentación	Donante	Receptor	Cantidad	Precio/Unidad	Valor (\$)
14-Jul-11	Artemether-Lumefantrine (24)	Tableta	Fondo Estratégico	Guyana	8,640	0.054	468.29 (*)
<b>TOTAL</b>					<b>8,640</b>		<b>468.29</b>
Donaciones/Préstamos OPS/RAVREDA							
Fecha	Medicamento	Presentación	Donante	Receptor	Cantidad	Precio/Unidad	Valor (\$)
sep/ oct 2010	Quinina Clorhidrato300mg/ml	Ampolla	AMI/Ravreda/OPS	Bolivia	200	0.286	57.22 (*)
sep/ oct 2010	Quinina tabletas 300mg	Tableta	AMI/Ravreda/OPS	Bolivia	2,000	0.062	124.00 (*)
sep/ oct 2010	Artesunato anhidro amp 60 mg	Ampolla	AMI/Ravreda/OPS	Bolivia	50	2.000	100.00 (*)
sep/ oct 2010	Clindamicina Clorhidrato150 mg	Tableta	AMI/Ravreda/OPS	Bolivia	3,000	0.096	288.00 (**)
sep/ oct 2010	Quinina Clorhidrato 300 mg/ml	Ampolla	AMI/Ravreda/OPS	Colombia	3,600	0.286	1,029.96 (*)
sep/ oct 2010	Quinina tabletas 300 mg	Tableta	AMI/Ravreda/OPS	Colombia	3,000	0.062	186.00 (*)
sep/ oct 2010	Artesunato anhidro amp 60 mg	Ampolla	AMI/Ravreda/OPS	Colombia	1,000	2.000	2,000.00 (*)
sep/ oct 2010	Quinina Clorhidrato 300 mg/ml	Ampolla	AMI/Ravreda/OPS	Perú	816	0.286	233.46 (*)
sep/ oct 2010	Artesunato anhidro amp 60 mg	Ampolla	AMI/Ravreda/OPS	Perú	1,125	2.000	2,250.00 (*)
sep/ oct 2010	Quinina Clorhidrato 300 mg/ml	Ampolla	AMI/Ravreda/OPS	Suriname	2,000	0.286	572.20 (*)
sep/ oct 2010	Quinina tabletas 300 mg	Ampolla	AMI/Ravreda/OPS	Suriname	13,680	0.062	848.16 (*)
sep/ oct 2010	Artesunato anhidro amp 60 mg	Ampolla	AMI/Ravreda/OPS	Suriname	1,360	2.000	2,720.00 (*)
sep/ oct 2010	Quinina Clorhidrato 300 mg/ml	Ampolla	AMI/Ravreda/OPS	Nicaragua	320	0.286	91.55 (*)
sep/ oct 2010	Quinina tabletas 300 mg	Tableta	AMI/Ravreda/OPS	Nicaragua	140	0.062	8.68 (*)
sep/ oct 2011	Sulfadoxina/Primetamina	Tableta	AMI/Ravreda/OPS	Nicaragua	100	0.100	10.00 (*)
sep/ oct 2010	Quinina Clorhidrato 300 mg/ml	Ampolla	AMI/Ravreda/OPS	Honduras	300	0.286	85.83 (*)
sep/ oct 2010	Quinina tabletas 300 mg	Tableta	AMI/Ravreda/OPS	Honduras	1,200	0.062	74.40 (*)
sep/ oct 2011	Sulfadoxina/Primetamina	Tableta	AMI/Ravreda/OPS	Honduras	900	0.100	90.00 (*)
sep/ oct 2010	Quinina Clorhidrato 300 mg/ml	Ampolla	AMI/Ravreda/OPS	Guatemala	150	0.286	42.92 (*)
sep/ oct 2010	Quinina Clorhidrato 300 mg/ml	Ampolla	AMI/Ravreda/OPS	Guyana	5,670	0.286	1,622.19 (*)
sep/ oct 2010	Artesunato anhidro amp 60 mg	Ampolla	AMI/Ravreda/OPS	Guyana	600	2.000	1,200.00 (*)
ene/feb 2011	Quinina Clorhidrato 300 mg/ml	Ampolla	AMI/Ravreda/OPS	Bolivia	300	0.286	85.80 (*)
ene/feb 2011	Clindamicina Clorhidrato 300 mg	Tableta	AMI/Ravreda/OPS	Bolivia	6,000	0.096	574.80 (**)
<b>TOTAL</b>					<b>47,511</b>		<b>\$ 14,295.16</b>
Intercambios departamento- departamento							
Fecha	Medicamento	Presentación	Donante	Receptor	Cantidad	Precio/Unidad	Valor (\$)
abr-11	Primaquina 15 mg	Tableta	Potosí, Bolivia	Chuquisaca, Bolivia	800	0.010	7.60 (*)
abr-11	Primaquina 15 mg	Tableta	Tarija, Bolivia	Pando, Bolivia	1,800	0.010	17.10 (*)
abr-11	Primaquina 5 mg	Tableta	Tarija, Bolivia	Pando, Bolivia	1,800	0.008	13.50 (*)
may-11	Primaquina 15 mg	Tableta	Tarija, Bolivia	Riberalta, Bolivia	2,000	0.010	19.00 (*)
may-11	Primaquina 15 mg	Tableta	Tarija, Bolivia	Guayamerin, Bolivia	1,000	0.010	9.50 (*)
may-11	Artemether-Lumefantrine (6)	Tableta	Valle, Colombia	Chocó, Colombia	4,140	0.060	248.40 (*)
may-11	Artemether-Lumefantrine (12)	Tableta	Valle, Colombia	Chocó, Colombia	30,144	0.053	1,603.66 (*)
may-11	Artemether-Lumefantrine (18)	Tableta	Valle, Colombia	Chocó, Colombia	4,500	0.020	90.00 (*)
may-11	Primaquina 5 mg	Tableta	Tarija, Bolivia	Riberalta, Bolivia	2,000	0.008	15.00 (*)
may-11	Primaquina 5 mg	Tableta	Tarija, Bolivia	Guayamerin, Bolivia	1,000	0.008	7.50 (*)
jul-11	Cloroquina 150 mg	Tableta	Antioquia, Colombia	Nariño, Colombia	20,000	0.009	186.00 (*)
ago-11	Artemether-Lumefantrine (6)	Tableta	Cauca, Colombia	Chocó, Colombia	2,340	0.060	140.40 (*)
<b>TOTAL</b>					<b>71,524</b>		<b>\$ 2,357.66</b>
<b>GRAN TOTAL</b>					<b>1,631,539</b>		<b>\$ 53,498.00</b>

\* Precio de acuerdo a solicitud de licitaciones, 2011

\*\* Precio de acuerdo a la Guía Internacional de Precios de Medicamentos de MSH

Source: Data from PAHO's Strategic Fund and national malaria control programs.



Source: Data from the Pan-American Health Organization's Strategic Fund and national malaria control programs.

**Figure 2. Exchanges between countries, 2009–2010**

At the AMI/MSH workshop held in Lima, Peru (August 2011), a minimum of four countries were identified that would require a donation of medicines for 2012: Bolivia, Nicaragua, Peru, and Honduras. As an alternative to facing a medicine stock-out, it was proposed that mechanisms for intercountry exchanges and donations be continued with coordination by PAHO/SF and financing provided by USAID/AMI and with the appropriate commitment from national counterparts.

The process of consolidating the regional system for monitoring the availability and consumption of antimalarials in countries of the region has been progressively expanding toward the departmental and regional levels, which currently report quarterly data on consumption and availability. Here, too, within the NMCPs, these data have made it possible to streamline purchases; avoid potential stock-outs; redistribute stock between central, departmental, or regional warehouses; and guarantee minimum levels of stock on hand.

As of June 2011, the information provided by this system shows percentages of medicine availability in central warehouses of as much as 92 percent (with a range between 38 percent and 92 percent), and 94 percent as of September of the same year (with ranges between 13 percent and 94 percent). For the latter period, information from the countries signals an early warning of possible stock-outs (table 13).

**Table 13. Percentage Availability of Antimalarials in the Central Warehouse, 2010–2011**

Country	Quarter						
	First 2010	Second 2010	Third 2010	Fourth 2010	First 2011	Second 2011	Third 2011
<b>Bolivia</b>	9%	70%	91%	91%	91%	66%	66%
<b>Brazil</b>	75%	*	*	*	*	89%	94%
<b>Colombia</b>	62%	58%	100%	100%	100%	92%	54%
<b>Ecuador</b>	50%	67%	67%	100%	100%	89%	67%
<b>Peru</b>	71%	13%	13%	100%	75%	38%	13%

Source: Report generated by the System for Monitoring the Availability of Antimalarials in Countries of the Amazon basin, 2010–2011.

\*No data reported.

Based on agreements and commitments undertaken at the AMI/MSH workshop held in Lima, Peru, in August 2011, it is hoped that this process of monitoring regional inventories can be institutionalized by the regional information center (DIGEMID, in Peru) and that it will help guide coordination of grants and exchanges with the periodic information consolidated from the central and regional warehouses in the countries of the region.



**ANNEX 3: TREATMENT REGIMENS FOR *P. FALCIPARUM* USED IN COUNTRIES OF THE REGION, STANDARDIZATION STATUS, 2011**

<b>Country</b>	<b>Regimen 2010</b>	<b>Proposed</b>	<b>Regimen 2011</b>	<b>Dosage form</b>	<b>Standardization of regimens</b>
<b>Bolivia</b>	AS + MQ (as single drugs)	AS + MQ + PQ	AS-MQ + PQ	Fixed-dose combination	Included PQ beginning in 2007; will not use ATM-LUM; not included in national regimens.
<b>Brazil</b>	ATM-LUM AS-MQ	ATM-LUM+PQ AS-MQ +PQ	ATM-LUM + PQ AS-MQ	Both fixed-dose combination	Decision made to use ATM-LUM + PQ at March 2011 meeting. Only updating of treatment guidelines remains to be done.
<b>Colombia</b>	ATM-LUM	ATM-LUM +PQ	ATM-LUM + PQ	Fixed-dose combination	Incorporated use of PQ.
<b>Ecuador</b>	AS + S-P (Co-blister)	ATM-LUM + PQ	ATM-LUM + PQ	Fixed-dose combination	Was incorporated into regimen standardization process; currently awaiting "officialization" in regulations.
<b>Guyana</b>	ATM-LUM AS + MQ + PQ	ATM-LUM + PQ	ATM-LUM + PQ	Fixed-dose combination	Incorporated use of PQ.
<b>Honduras</b>	CQ + PQ S-P + Q	Continue using same schemes			
<b>Nicaragua</b>	CQ + PQ S-P + AS	Continue using same schemes			
<b>Peru</b>	AS + MQ	AS+MQ + PQ ATM-LUM + PQ	AS + MQ	Single drugs	Not incorporated into standardization.
<b>Suriname</b>	ATM-LUM	ATM-LUM + PQ	ATM-LUM	Fixed-dose combination	Not incorporated into standardization.