

Criteria for Planning and Distributing Medicines in Areas with a Low Incidence of Malaria



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Background

Most countries in Latin America and the Caribbean have experienced a sharp decline in the number of cases of malaria recorded over the past decade. The number of cases in the region has dropped from 1.8 million in 2002 to 490,000 in 2011 (a decrease of 58 percent). Thirteen of the 21 countries affected experienced decreases greater than 75 percent during that period.² The favorable outlook in a number of countries in the region in terms of a short-term push toward the complete elimination of malaria points to a need to review current malaria control strategies.³

One of the greatest challenges involves maintaining an uninterrupted supply of antimalarial medicines in a scenario characterized by (a) a lack of interest among suppliers in selling the reduced volumes now required, and (b) the absence of explicit criteria for antimalarial supplies to those countries, or specific areas in those countries, where malaria incidence is low or nonexistent, but where a high risk of reintroduction of the disease still exists.⁴

Currently, the task of planning the annual purchase of antimalarials and the periodic dispatch of these medicines to the appropriate treatment units is based on expected morbidity, based on analysis of cases treated in prior years. The strict use of this methodology for calculating antimalarial requirements leads to a situation where areas recording few or no cases in past months receive no medicines, despite the continuing high risk of a new outbreak of malaria or the reintroduction of this disease.

In past years, several areas of the region have experienced significant outbreaks following prolonged periods during which no cases were recorded. In the department of Tumbes, Peru, after four years without cases, a new case of *P. falciparum* malaria was detected, confirming an epidemic that lasted from October 2010 to May 2012. In total, 203 cases were reported during this period. In the Loreto Region, also in Peru, the incidence of malaria more than doubled in 2012 from the previous year, reaching epidemic proportions.

¹ Consultants to Systems for Improved Access to Pharmaceuticals and Services (SIAPS) Program.

² World Health Organization. 2012. *World Malaria Report 2012*. Geneva: WHO.

³ Organización Panamericana de la Salud. 2011. Guía para la reorientación de los programas de control de la malaria con miras a la eliminación. OMS, <http://new.paho.org/hq/dmdocuments/2011/Guia-reorient-progr-control-malaria-eliminacion.pdf>.

⁴ Jiménez, Magdalena, Claudia Valdez, John Marion y Edgar Barillas. 2012. *Situación de la gestión del suministro de medicamentos para el tratamiento de la malaria en los países que comparten la Cuenca Amazónica y Centro America – octubre 2011*. Submitted to the US Agency for International Development by the Strengthening Pharmaceutical Systems (SPS) Program. Arlington, VA: Management Sciences for Health (MSH).

Planning and Distribution Criteria

Since 2011, the Amazon Malaria Initiative (AMI), working through one of its partners—the Systems for Improved Access to Pharmaceuticals and Services (SIAPS) Program—has been advocating for adjustments to the criteria used for planning purchases and distribution of antimalarial supplies in low-incidence countries and localities.

Given the lack of international recommendations and documented experience with approaches to this problem, criteria were established in some countries by working groups consisting of national technical personnel together with consultants to SIAPS and the Pan-American Health Organization (PAHO). As of October 2012, planning and distribution criteria had been reviewed for seven countries: Ecuador (May 2011), Nicaragua (June 2011), Peru (June 2012), Honduras (August 2012), Bolivia (September 2012), and Brazil (October 2012).

All working sessions followed a similar methodology: (a) presentation of the current epidemiological situation and the status of antimalarial supply; (b) discussion of the relevance of adjusting planning and distribution criteria to respond to the needs of localities with a low incidence of malaria; (c) determination, as established by group consensus, of the minimum stock required, based on epidemiological scenarios in warehouses and health facilities located in areas of high, medium, low or zero incidence, but nonetheless characterized by the presence of risk factors; and (d) agreements and commitments to implement the agreed-upon criteria.

Although the countries expressed the planning and distribution criteria in differing forms, all used the same logic: ensure the timely treatment of regularly occurring cases of malaria while still addressing sporadic outbreaks or epidemics in low-incidence areas. All the countries considered minimum stocks in health facilities (and resources for volunteer assistants) in areas of low or no incidence but with risk factors for malaria transmission. For severe cases of malaria, all the countries agreed to keep treatment at hospitals or health centers capable of managing such treatment and reserve stocks at departmental levels. The annex contains tables with the ratified criteria for each country.

Two countries have incorporated these criteria in their national guidelines. Four have used them to redistribute stock already available, usually inventory at central or regional stores. Another four countries have applied the planning criteria for their annual medicine purchases, but only Ecuador (the first country to establish criteria)—in April 2013—has received in its central store and distributed to peripheral locations the medicines scheduled (table 1).

Table 1. Progress in Implementing Planning Distribution Criteria in Low-Incidence Areas

Country	Criteria established and validated	Criteria incorporated into national guidelines	Redistribution of stock already available in country	Planning for annual procurement	National distribution of adjusted purchase
Ecuador	X		X	X	X
Nicaragua	X	X			
Honduras	X		X	X	
Brazil	X	X	X		
Peru	X		X	X	
Bolivia	X			X	

Implications of the implementation of these criteria

It is expected that implementation of these criteria will have implications at a minimum in the areas listed below:

- **Timeliness of treatment:** Implementation of these criteria ensures the timely provision of treatment, thereby helping avoid the transmission of this disease.
- **The volume of medicines required to replenish the supply chain:** Implementation of these criteria requires a greater volume of medicines, especially during the first year of implementation. This, in turn, generates increased budgetary demands.
- **Losses caused by drug expiration:** When these criteria are implemented, the possibility of an increase in losses caused by drug expiration because of the low degree of inventory turnover in low-incidence areas should be clearly recognized. Although the financial impact of such losses may not be significant, consideration should be given to the administrative implications that could conceivably be created by this situation.

During the second half of 2013, SIAPS will conduct a study designed to determine the implications for these three areas generated by the implementation of the adjusted planning and distribution criteria. The study will measure the increase in the number of units required in the planning exercise, the required budgetary increase, the increase in the number of expired units, and the increase in the number of patients receiving treatment within a period of 48 hours.

Annex. Tables of Ratified Planning Distribution Criteria in Low-Incidence Areas, by Country

Ecuador

Criteria for distribution of antimalarials

Medicines for uncomplicated malaria in adults, children, and infants

Level	Criteria
Central store	Minimum stock of medicines equal to the number of prior year treatments for the country / 2
Zonal store	Minimum stock of medicines equal to the number of prior year treatments for the zone / 2
Diagnostic post	Minimum stock equal to the medicines used for prior year treatments for the diagnostic post / 3
Zonal stores in low-incidence areas	Minimum stock of 4 treatments × number of diagnostic posts
Diagnostic posts with < 12 cases	Minimum stock of 4 treatments

Medicines for severe cases

Level	Criteria
Central store	Quantity of medicines equal to the sum of the stocks in the zonal stores
Zonal store	Double the medicines for prior year treatments in the zone
Hospitals with specialized malaria care	Double the medicines for prior year treatments in the hospital, but not less than 3 treatments
Zonal store where cases are not diagnosed	4 treatments × number of hospitals

Criteria for planning requirements for antimalarial medicines

Uncomplicated malaria: Use the following formula:

Quantity to purchase =
total inventory that should be stocked in all levels – stock en central and zonal stores

Severe malaria: Use the following formula:

Quantity to purchase =
total inventory that should be stocked in all levels – stock en central and zonal stores

Nicaragua

Level of care and storage	Medicines	Low risk	Medium risk	High risk
		Minimum stock criteria	Minimum stock criteria	Stock criteria
Centro de Insumos para la Salud (CIPS; Health Supplies Center)		CIPS should have storage for one year for 500 treatments, reagents, gloves, alcohol, etc.		
Sistemas Locales de Atención en Salud (SILAIS; Local Health Care Systems)	Chloroquine 250 mg Primaquine 5 mg Primaquine 15 mg Quinine Clindamycin	SILAIS should stock 2 adult treatments and 2 children's treatments for severe cases. For basic treatment, SILAIS should have 4 treatments for each cada Equipo de Salud Familiar y Comunitario (ESAF; Family and Community Health Team) and 1 treatment for each volunteer assistant. In addition, SILAIS should have 50 basic treatments for outbreaks (in case of disasters).	SILAIS should stock 2 adult treatments and 2 children's treatments for severe cases. For basic treatment, SILAIS should have 4 treatments for each Equipo de Salud Familiar y Comunitario (ESAF; Family and Community Health Team) and 1 treatment for each volunteer assistant. In addition, SILAIS should have 50 basic treatments for outbreaks (in case of disasters).	SILAIS should stock 5 adult treatments and 5 children's treatments for severe cases. In addition, it should have 5 basic treatments per health unit and 2 treatments for reach volunteer assistant. In case of outbreaks, SILAIS should have 300 basic treatments for each outbreak (in case of disasters).

Level of care and storage	Medicines	Low risk	Medium risk	High risk
		Minimum stock criteria	Minimum stock criteria	Stock criteria
Hospitals	Chloroquine 250 mg Primaquine 5 mg Primaquine 15 mg Quinine 300 mg/mL	Each departmental hospital should have 3 adult treatments and 2 children's treatments for severe cases. National referral hospitals should have 3 adult treatments and 3 children's treatments for severe cases. For basic treatments, hospitals should have 2 adult treatments and 2 children's treatments for each health unit.		Primary hospitals and hospitals located in special zones should have y adult treatments and 7 children's treatments for severe cases. For basic treatments, hospitals should have 14 adult treatments and 6 children's treatments for each health unit.
Health center	Chloroquine 250 mg Primaquine 5 mg Primaquine 15 mg	Municipalities without malaria cases should have 4 basic treatments for adults and 4 for children.	Each health center in medium-risk municipalities where malaria cases have occurred should have 5 basic treatments for each case during the previous year. In special zones, health centers should have 10 treatments for each confirmed malaria case during the previous year.	Each health center in high-risk municipalities where malaria cases have occurred should stock 30 basic treatments for each confirmed malaria case during the previous year.
Health post	Chloroquine 250 mg Primaquine 5 mg Primaquine 15 mg	Health posts should have 4 basic treatments for adults and 4 for children for each ESAFC.	In medium-risk areas, each health post should have 7 basic treatments for adults and 3 for children.	In high-risk areas, each health post should have 14 basic treatments for adults and 6 for children.

Level of care and storage	Medicines	Low risk	Medium risk	High risk
		Minimum stock criteria	Minimum stock criteria	Stock criteria
Volunteer assistant	Chloroquine 250 mg Primaquine 5 mg Primaquine 15 mg	In low-risk localities, each volunteer assistant should have 2 basic adult treatments and 2 for children.	In medium-risk localities, each volunteer assistant should have 5 basic treatments for adults and 5 for children.	In high-risk localities, each volunteer assistant should have at least 15 basic treatments for adults and 5 for children.

Honduras

Minimum stock for first-line treatment: Chloroquine and primaquine

		Malaria transmission risk			
		High	Medium	Low	Not endemic
Store or location	Responsible party	Colon	Atlantida	Comayagua	Copan
		Gracias a Dios	Choluteca	Cortes	Santa Barbara
		Islas de la Bahia	Francisco Morazán	Metro DC	Lempira
		Olancho	Yoro	Metro SPS	Intibuca
			Valle	La Paz	Ocotepeque
			El Paraiso		
Central store	National Malaria Program	At the time of purchase, one year and 6 months (18 months)			
Departmental store	Departmental Region	3 months	3 months	3 months	5 treatments
Health unit	Municipal team	10 treatments	5 treatments	3 treatments	2 treatments
Volunteer assistant	Municipal TSA	5 treatments	3 treatments	1 treatment	None

Minimum stock for second-line treatment and severe cases: Sulfadoxine-pyrimethamine and quinine

		Malaria transmission risk			
		High	Medium	Low	Not endemic
Store or location	Responsible	Colon	Atlantida	Comayagua	Copan
		Gracias a Dios	Choluteca	Cortes	Santa Barbara
		Islas de la Bahia	Francisco Morazán	Metro DC	Lempira
		Olancho	Yoro	Metro SPS	Intibuca
			Valle	La Paz	Ocotepeque
			El Paraiso		
Central store	National Malaria Program	5 treatments			
National hospital		3 treatments			
Departmental hospital	Departmental Region	2 treatments and 5 for Hospital-Puerto Lempira	2 treatments	1 treatment	1 treatment
Health unit	Municipal team	None	None	None	None
Volunteer assistant	Municipal TSA	None	None	None	None

Brazil

Minimum stock for low-incidence posts

Medicine	Quantity
Artemether-lumefantrine c/6 (6 months–2 years)	1
Artemether-lumefantrine c/12 (3–8 years)	1
Artemether-lumefantrine c/18 (9–14 years)	1
Artemether-lumefantrine c/24 (14 years or older)	2
Chloroquine 150 mg tablet	120
Primaquine 15 mg tablet	150
Primaquine 5 mg tablet	30
Quinine sulfate 500 mg tablet	20
Doxycycline 100 mg tablet	15
Quinine dihydrochloride 300 mg/mL, 2mL ampoule	50
Clindamycin 300 mg capsule	32
Clindamycin 600 mg/4 mL ampoule	100
Artemether 80 mg/mL ampoule	12
Artesunate 60 mg ampoule flask	20

In Maranhão state, modifications have been made for treatment of *P. falciparum* malaria.

Quantity	Cantidad
Artesunate + Mefloquine c/3 (6–11 months)	1
Artesunate + Mefloquine c/6 (1–5 years)	1
Artesunate + Mefloquine c/3 (6–11 years)	1
Artesunate + Mefloquine c/6 (12 years or older)	2

Peru

Summary of criteria for distribution of minimum stock in regions with malaria risk factors and incidence

Level	Health promoters	Adults		Children		Infants		Severe
		> 6 cases	≤ 6 cases	> 6 cases	≤ 6 cases	> 6 cases	≤ 6 cases	
Health centers, health posts, and hospitals in general*	Stock for 7 <i>Vivax</i> treatments and 3 <i>Falciparum</i> treatments, according to the parasite species	Stock for one-third the number of cases as the previous year	Stock for 2 cases	Stock for one-third the number of cases of the previous year	Stock for 1 case	Stock for one-third the number of cases of the previous year	Stock for 1 case	
Hospitals and health centers identified for care of severe malaria*	Stock for 7 <i>Vivax</i> treatments and 3 <i>Falciparum</i> treatments, according to the parasite species	Stock for one-third the number of cases as the previous year	Stock for 2 cases	Stock for one-third the number of cases of the previous year	Stock for 1 case	Stock for one-third the number of cases of the previous year	Stock for 1 case	Stock equal to twice the number of severe cases treated the previous year and not less than 3 treatments
Substore		Stock for one-third the number of cases as the previous year in its zone and not less than the quantity for facilities with risk factors		Stock for one-third the number of cases as the previous year in its zone and not less than the quantity for facilities with risk factors		Stock for one-third the number of cases as the previous year in its zone and not less than the quantity for facilities with risk factors		Stock equal to twice the number of severe cases treated the previous year in its zone and not less than the number of hospitals and health centers providing care for severe malaria cases in the zone multiplied by 2

Level	Health promoters	Adults		Children		Infants		Severe
		> 6 cases	≤ 6 cases	> 6 cases	≤ 6 cases	> 6 cases	≤ 6 cases	
Almacén Dirección Regional de Salud (DIRESA; Regional Health Directorate Store)		Stock for one-third the number of reported cases as the previous year in the region and not less than the quantity for regional facilities in zones with risk factors		Stock for one-third the number of reported cases of the previous year in the region and not less than the quantity for regional facilities in zones with risk factors		Stock for one-third the number of reported cases of the previous year in the region and not less than the quantity for regional facilities in zones with risk factors		Stock equal to twice the number of severe cases treated the previous year in the region and not less than the number of hospitals and health centers providing care for severe malaria cases multiplied by 2
Ministry of Health (MOH) Store/Strategic Health Resources Supply Directorate (DARES)		Stock for half the number of cases reported the previous year in the country		Stock for half the number of cases reported the previous year in the country		Stock for half the number of cases reported the previous year in the country		Stock equal to twice the number of severe cases treated the previous year in the country and not less than the number of regions with risk factors multiplied by 4

* These criteria may be modified by the Regional Coordinator of Metaxenic Diseases in consideration of the individual particular risk levels of some locations and their geographic accessibility.

Summary of criteria for distribution of minimum stock in regions with malaria risk factors and without incidence

Level	Adults	Children	Infants	Severe
Health centers and hospitals in general (excluding health posts)	Stock for 2 cases	Stock for 1 case	Stock for 1 case	
Hospitals and health centers treating severe malaria	Stock for 2 cases	Stock for 1 case	Stock for 1 case	Stock for 3 treatments
Substore	Stock equal to the number of facilities with risk factors in its zone	Stock equal to the number of facilities with risk factors in its zone	Stock equal to the number of facilities with risk factors in its zone	Stock equal to the number of hospitals and health centers treating severe malaria in its zone multiplied by 2
DIRESA store	Stock equal to the number of facilities with risk factors in the region	Stock equal to the number of facilities with risk factors in the region	Stock equal to the number of facilities with risk factors in the region	Stock equal to the number of hospitals and health centers treating severe malaria in its region multiplied by 2

Summary of criteria for distribution of minimum stock in regions without malaria risk factors

Level	Adults	Children	Infants	Severe
DIRESA store	Stock for 10 cases	Stock for 10 cases	Stock for 10 cases	Stock for 3 treatments
Referral hospitals of Lima and MOH Pharmacy	Stock for 10 cases	Stock for 10 cases	Stock for 10 cases	Stock for 5 treatments

Bolivia

Level of care/storage	Reported cases of past treatment	Reserve stock criteria									
		Low Potosi, Cochabamba La Paz, Chuquisaca, Santa Cruz		Medium Tarija, Chuquisaca, Santa Cruz, La Paz		High Riberalta, Pando		Hyperendemic Guayaramerín		Severe cases (regional programs and hospitals)	Special
		<i>P. vivax</i>	<i>P. falciparum</i>	<i>P. vivax</i>	<i>P. falciparum</i>	<i>P. vivax</i>	<i>P. falciparum</i>	<i>P. vivax</i>	<i>P. falciparum</i>	<i>P. falciparum</i>	<i>P. falciparum</i>
Health post (Health post FIM)	Cases										
	No cases	2 Tx		4 Tx		10 Tx	3 Tx	15 Tx	5 Tx		
Health center (Health center FIM)	Cases										
	No cases	3 Tx		6 Tx		15 Tx	3 Tx	20 Tx	8 Tx		2 Tx
Referral hospitales (level III) (Referral FIM)	Cases										
	No cases	5 Tx		10 Tx		20 Tx	5 Tx	20 Tx	10 Tx	5 Tx*	2 Tx
Depart- mental and regional programs	Cases										
	No cases	15 Tx	5 Tx	30 Tx	10 Tx	100 Tx	25 Tx	500 Tx	30 Tx	5 Tx	2 Tx
ADRA						100 Tx	40 Tx				

Nota: FIM = Farmacia Institucional Municipal (Institutional Municipal Pharmacy); Tx = treatments.

* Guayaramerín