

# Managing the Supply of Antimalarials in Low-Incidence Regions



**USAID**  
FROM THE AMERICAN PEOPLE

**SIAPS**  
Systems for Improved Access  
to Pharmaceuticals and Services

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## Introduction

Between 2000 and 2011, the number of confirmed cases of malaria in the Americas decreased by 59 percent. Eighteen countries contributed to this change, 15 of them with reductions above 50 percent, whereas 3 countries showed increases in the number of cases reported.<sup>3</sup>

The reasons for this significant decrease in incidence are not completely clear. The strengthening of control strategies, including the introduction of artemisinin derivatives to treat *P. falciparum* in the countries sharing the Amazon basin, should have been a contributing factor, although a study carried out by the Amazon Malaria Initiative (AMI) showed that implementation of control strategies in various countries of the region was not entirely adequate.<sup>4</sup>

Since 2002, various Management Sciences for Health (MSH) programs,<sup>5</sup> in association with the US Agency for International Development (USAID) within the AMI framework, have strengthened management of the supply of antimalarials in countries sharing the Amazon basin. More recently, this type of support was extended to Central American countries.

The changes occurred over the past decade in the malaria epidemiological situation in the countries of the Amazon region and Central America have demanded the evolution of strategies promoted to prevent and control malaria, among them ensuring access to antimalarial supplies of good quality for those who need them.

Diagnostic supplies and antimalarial medicines are essential elements for malaria control in regions with low incidence and for plans to move to preelimination and elimination phases. Paradoxically, just when fewer medicines and supplies are required, their management faces challenges larger and different from those posed when required in larger volumes. Following are some factors contributing to the new challenges—

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<sup>3</sup> World Health Organization (WHO). 2011. *World Malaria Report 2011*. Geneva: WHO.

<sup>4</sup> A complete description of the methodology, as well as results, is in the article “Rapid assessment of the performance of malaria control strategies implemented by countries in the Amazon subregion using adequacy criteria: Case study” on the website <http://www.malariajournal.com/content/10/1/379>.

<sup>5</sup> Rational Pharmaceutical Plus (RPM Plus), Strengthening Pharmaceutical Systems (SPS), and currently Systems for Improved Access to Pharmaceuticals and Services (SIAPS).

- The decrease in incidence has not been homogeneous in the Region<sup>6</sup> or in the interior of these countries. Higher incidence now occurs in remote and/or difficult to access locations, or in populations not covered by conventional health services because their particular living and working conditions.
- Pharmaceutical suppliers have little or no interest in marketing the reduced volumes that are now required, which has left some countries' national solicitations for the purchase of first-line medicines with not one bidder and national markets without suppliers of medicines for treatment of severe cases.
- Procurement of antimalarial supplies, which is now frequently outside the control of national malaria control programs (NMCPs), rely on historical morbidity records, so that the NMCPs confront difficulties in ensuring sufficient quantities are purchased to maintain adequate inventories in facilities located in areas of very low or null malaria incidence. Similarly, the distribution of supplies fails to consider the risk of outbreaks or reintroduction of malaria, meaning that areas of low or no incidence no longer receive medicines.
- The decrease in the volume of antimalarial supplies required makes maintaining a separate procurement and distribution system for them inefficient to the eyes of planners and leads to its abandonment toward including antimalarial supplies in a country's general pharmaceutical supply management system.
- In areas of low incidence, personnel lose the skills required to diagnose and treat malaria, while institutions lose the capacities to monitor, prevent, and control malaria. This situation has contributed to delays in the response to outbreaks that occur in areas where cases had disappeared.

### **Strengthening the Management of Antimalarial Supplies in Areas of High and Low Incidence in the Amazon Region and Central America**

The system that provides access to the supplies necessary to diagnose and treat malaria in the Amazon Region and in Central America has three levels: regional, national, and local. Each of these levels covers a distinct "space" and must take into account the heterogeneity existing at lower levels. The regional level must be aware that malaria patterns differ among countries, and the national level must consider how malaria occurs differently modes in its departments (or states, or provinces) and localities.

The support provided by MSH's USAID-funded projects and other AMI partners has contributed to strengthening the system at all three levels and to make the three levels function in explicit coordination. The latter is a deceptively simple description of a system comprising at least the following components—

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<sup>6</sup> "Region" is used here to refer to countries of Latin America and the Caribbean.

- A regional entity, the Pan American Health Organization (PAHO), and a regional network, the Amazon Network for the Surveillance of Antimalarial Drug Resistance (Red Amazónica de Vigilancia de la Resistencia a los Antimalarials, or RAVREDA), constituted in 2001
- Twelve countries (counting only direct AMI participants)
- Approximately 202 subnational jurisdictions (counting only first-level subdivisions, whether department, state, province, or district), which in turn have many more localities with health facilities that in some measure must be considered in relation to antimalarial supplies

The current state of the system, including the assistance directed toward its strengthening, was reached in what can be described as three phases—

- During the first phase, before AMI and RAVEDRA existed, the system was essentially addressed at the national level. Although based on international recommendations, technical support was given to each country individually, and each country worked with little or no coordination with its neighbors.
- In the second phase, attention to the national level continued, but the appearance of RAVEDRA and the support of AMI strengthened a regional perspective. Countries formed a network and began to adopt common approaches and tools. Interaction with a group of countries made technical assistance more efficient by dealing with shared needs while still taking into consideration specific country needs.
- In the third phase, mainly because of the recognition of the heterogeneity of the epidemiological context, emphasis on the local perspective was added. This takes into consideration the need for responses suitable to each municipality or population living in special circumstances.

The following table presents examples of the work done in prevention and control of malaria on each level.

Regional	National	Local
Using common protocols to evaluate efficacy of antimalarial medicines	Strengthening the capacity to forecast requirements for antimalarial supplies, with emphasis on low-incidence situations	Introducing the three levels of approach for quality control of antimalarials
Adopting artemisinin-based combined therapies by Amazon basin countries	Evaluating the adequacy of implementation of malaria control interventions	Introducing a model for supervision of availability and use of antimalarials in health facilities
Making joint purchases of antimalarials through PAHO's Strategic Fund and identifying bottlenecks in the process	Training national-level personnel in advanced laboratory methods for diagnosis, evaluation of resistance, and quality control	Identifying differentiated strategies for populations living in special circumstances
Establishing a regional warehouse for second-line antimalarials to serve countries' needs	Strengthening the national entomological surveillance system	Evaluating the adequacy of implementation of malaria control interventions
Establishing a network for monitoring antimalarial medicine inventories	Introducing the use of rapid diagnostic tests for malaria	Using the US Centers for Disease Control and Prevention bottle bioassay method in evaluating the susceptibility of malaria vectors to insecticides
Establishing a network for external evaluation of performance of diagnosis by microscopy		
Developing strategic guidance for the main lines of action in malaria prevention and control, taking into account the differing epidemiological contexts		

Within this framework, the technical assistance of MSH's Systems for Improved Access to Pharmaceuticals and Services (SIAPS) program is organized in the following intervention "spaces"—

### Regional Level

- Regional inventory monitoring:** Since 2010, the Strengthening Pharmaceutical Systems (SPS) program, followed by SIAPS, has supported the monitoring of antimalarial stocks in central and regional warehouses in the Region's countries. This system has favored the exchange and donation of medicines and has helped, in Ecuador, to organize an antimalarial stock consumption and inventory information system.

- **Standardization of treatment regimens:** In different regional fora, AMI has encouraged discussing the convenience—for regional coordination of supplies—of standardized treatment regimens. The biggest difference of opinion between decision makers arose about two alternative regimens for *P. falciparum*: artesunate + mefloquine as opposed to artemether + lumefantrine. SIAPS has developed documents to simplify the decision-making process.
- **Joint purchase of medicines:** In the course of regional meetings organized by SPS, representatives from regional malaria programs requested from PAHO’s Strategic Fund the development of a joint purchasing system for the acquisition of antimalarials. The mechanism has been operating since 2011, although country adherence with established procedures is not uniform. In 2012, SIAPS finalized a study on bottlenecks that countries face in acquisitions through the PAHO Strategic Fund. It is hoped that this regional study, as well as other individual studies that may be required by different countries, will allow more complete adherence to this regional purchasing mechanism.
- **Management of donations for treatment of severe cases:** Given the reduced volume in demand, the acquisition of medicines for severe cases is especially challenging. Upon request from AMI member countries, the PAHO Strategic Fund purchases these medicines with USAID resources and delivers them as donations to those countries. This initiative has solved the shortage of these products.

## National Level

- **Incorporating the provision of antimalarials into national pharmaceutical management systems:** Whether as the result of sector reforms or because of the need to introduce efficiency into the supply system, several countries in the Region are incorporating the supply of antimalarials into national supply management systems. AMI intends to accompany the integration processes in at least two countries in the Region: Bolivia and Colombia.
- **Supporting national studies of the performance of control strategies (“adequacy”):** SPS supported malaria control performance studies in several countries in the Region, at the national strategic level<sup>7</sup> as well as operating levels, by supporting national supervision systems. In future years, AMI will develop tools to evaluate the bridging of gaps in the performance of antimalarial supply, comparing baseline information with periodic surveillance evaluations.
- **Designing national strategies to control outbreaks and avoid reintroduction:** SPS and SIAPS have supported several countries in determining minimum medicine stocks to be maintained in locations that present few, or no, malaria cases. The impact of these reviewed programming and distribution criteria on timely treatment and supply will be evaluated systematically. In addition, SIAPS is studying in low incidence areas health

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<sup>7</sup> Between 2010 and 2011, “adequacy” studies were implemented in eight countries of the Region. The results of the first studies were presented in an article published in the *Malaria Journal* (<http://www.malariajournal.com/content/10/1/379>).

workers capacities to effectively diagnose and treat malaria. These investigations will be complemented with case studies of institutional responses to recent outbreaks in the Region. It is expected that these studies will provide the information needed to develop strategies to avoid reintroduction of malaria in countries or locations that have reached pre-elimination phases.

## Local Level

- **Decentralized support in high- and low-incidence areas:** The good practices in pharmaceutical supply management that AMI has supported for several years demand specific information, adjustments, and technical support in their implementation in decentralized areas that present extreme epidemiological conditions. SIAPS has studied the supply situation in two Peruvian departments (Loreto and Madre de Dios) and in one Colombian department (Chocó). Building on these baseline diagnostics, the interventions needed to support supply in high-incidence areas were agreed to with local counterparts. SIAPS is also planning to implement demonstration interventions that aim at preventing the reintroduction of the disease by adjusting the supply of medicines in areas with very low, or no, incidence.

In Brazil, SIAPS will support the reproduction at state level of the *adequacy* study completed on a national level. The results will enable the states to *close gaps* with the implementation of appropriate control strategies.

- **Differentiated strategies for groups living and working in special circumstances:** The decrease in malaria incidence in the Region's countries has exposed localities with a high concentration of cases associated to specific factors in their population's working and living conditions. The most illustrative areas are those of artisanal mining on the borders of Brazil and Guyana, and Suriname and French Guiana. Evidence gathered by AMI partners suggests that in these zones, where unauthorized medicine of dubious origin circulates, the generation of strains resistant to artemisinin derivatives may occur. An alternative approach for diagnosis and treatment in these communities requires studying the current situation of access to and use of medicines. AMI will carry out this study during the first half of 2013.

## Conclusion

Experience highlights the importance of considering the three levels, or spaces, described here in designing and implementing a technical assistance program to strengthen malaria prevention and control—that is, to combine regional, national, and local perspectives.

In the case of supply systems, it is particularly important to recognize that the system comprises these three levels and that an effective and efficient system requires that the work at each one must be coordinated with that done at the others.