

# POLICY BRIEF: Improving Access to Malaria Diagnosis and Treatment in Remote Areas of the Amazon Basin Countries

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## Background

Malaria remains a public health threat in the Americas even though the reduction in the number of cases has been significant. The region experienced a reemergence of cases in the 1990s with a peak in 1999. Between 2000 and 2011, the number of cases declined by 58%, to 490,000 with 13 of 21 endemic countries reducing prevalence by more than 75%.<sup>1</sup> Eight Central and South American countries (Belize, Costa Rica, Dominican Republic, El Salvador, Mexico, Nicaragua, Panama, and Paraguay) have decided to reorient their malaria programs and are looking to eliminate native malaria transmission within their borders.<sup>2</sup>

Countries in the region have been successful in eliminating malaria in large geographical areas that have stable populations and good access to health care and medicines, yet malaria thrives in remote regions of the countries or “hot spots” where the population has limited access to basic services. In Brazil, French Guiana, Guyana, and Suriname, malaria cases are mainly transmitted in mining regions; other countries of the region face similar challenges diagnosing and treating malaria in their own hot spots. Elimination depends on effective control of malaria in the remaining hot spots.

Mining regions have attracted both legal and illegal groups of people into the remote areas of South America. The populations are centered in small towns or mining camps with mines dotting the surrounding area. In addition to miners, the populations of these camps include a variety of support personnel including shop owners, commercial sex workers, cooks, and families of the miners and other workers. The miners have the highest risk of contracting malaria for a variety of reasons including sleeping in hammocks without insecticide-treated nets. Miners work in open pits near water pools or rivers that have an abundance of mosquito breeding sites.<sup>3</sup> The miners’ regular travel between the main camp and the mines may also be a risk factor for *P. falciparum* infection.<sup>4</sup> Miners contract malaria in their work sites and transport the parasite to neighboring gold mining camps. Thus, malaria parasites are continuously being re-introduced into population centers, mining camps, and mines. Evidence shows that

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<sup>1</sup> World Health Organization. 2012. *World Malaria Report, 2012*. Geneva: WHO. Online version accessed on 3/6/2014 [http://www.who.int/malaria/publications/world\\_malaria\\_report\\_2012/report/en/](http://www.who.int/malaria/publications/world_malaria_report_2012/report/en/)

<sup>2</sup> University of California San Francisco. 2009. Malaria Elimination Group website. <http://www.malariaeliminationgroup.org/resources/elimination-countries> accessed 4/30/14.

<sup>3</sup> Heemskerk, M., and C. Duijves. 2012. *Searching for Gold, Finding Malaria. Baseline Study in Three Small Scale Mining Areas in the Suriname Interior*. Social Solutions.

<sup>4</sup> Yukich, J., C. Taylor, T.P. Eisele, et al. 2013. Travel History and Malaria Infection Risk in a Low-Transmission Setting in Ethiopia: A Case Control Study. *Malaria Journal*, 12:33. <http://www.malariajournal.com/content/pdf/1475-2875-12-33.pdf> accessed 4/30/14.

population movement has contributed to the reintroduction of malaria in previously malaria-free regions.<sup>5</sup>

Diagnosis and treatment can be difficult in this setting because of the long distances between the mines and towns. The infrastructure and behavioral challenges with the population in the remote areas hamper service provision for most countries. Because moving goods over poor or nonexistent roads is so costly, an interruption in the medicines and commodity supply often results. A recent study by Evans and others illustrated the existence of substandard medicines in the public sectors of the remote gold mining regions.<sup>6</sup> These conditions increase the risk that the malaria parasite will develop resistance to artemisinin-based combination therapies in the region as a result of inappropriate medicine use and poor-quality medicines.

### Access to Malaria Diagnosis and Treatment in Gold Mining Camps

The provision of diagnosis and treatment to these communities should consider the needs of the population given their living and working conditions. Therefore, the Suriname Ministry of Health (MOH) commissioned a knowledge, attitudes, and practices (KAP) study of malaria diagnosis and treatment in gold mining areas to improve understanding of their needs. The study aimed to reinforce public health professionals' understanding of the miners' treatment-seeking behaviors for malaria, their work habits, and their living arrangements so new initiatives could be designed to provide diagnosis and treatment.

The KAP study interviewed 211 miners and support personnel in Suriname and revealed that 34% of interviewees worked only in French Guiana and over 43% worked in both countries. Miners also reported working in Brazil and Guyana. The study reviewed treatment-seeking behaviors and medicine-use patterns. Out of 211 interviewees, 97 respondents (45%) reported using over-the-counter medicines to treat malaria without taking a test. Furthermore, about three-fifths of respondents (58%) who self-treated did not finish the treatment course. Although knowledge about malaria and its treatment has increased over the years in Suriname, behavior has remained largely the same.<sup>7</sup> Figure 1 summarizes the key malaria diagnosis and treatment problems identified in the study and where to focus interventions to improve medicine usage and treatment outcomes. A comprehensive strategy of locally appropriate, innovative solutions is needed to improve diagnosis and treatment in remote areas and hot spots.

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<sup>5</sup> Clendenes, Martin. 2012. *Situación Actual de la Malaria Región Tumbes 2012 (Current Malaria Situation, Tumbes Region 2012)*. Paper presented at AMI Regional Meeting, March 9, 2013.

<sup>6</sup> Evans, L., III, V. Coigbezm, A. Barajos, et al. 2012. Quality of Antimalarials Collected in the Private and Informal Sectors in Guyana and Suriname. *Malaria Journal*, 11:203.

<sup>7</sup> Heemskerk, M., and C. Duijves. 2013. *Study on Knowledge, Attitudes and Practices of Malaria and Malaria Treatment in the Small-Scale Gold Mining Sector in Suriname*. Submitted to the US Agency for International Development by the Systems for Improved Access to Pharmaceuticals and Services (SIAPS) Program. Arlington, VA: Management Sciences for Health



**Figure 1. Percentage of people taking a malaria test, receiving medication, and completing treatment the last time they experienced (suspected) malaria<sup>7</sup>**

### Implications for Action

The region's countries moving to eliminate malaria must provide universal access to prompt, accurate, and quality malaria diagnosis, followed by rapid treatment with effective antimalarials.<sup>8</sup> The last cases of malaria in remote hot spots in low-incidence settings are hard to reach. Pharmaceutical management for malaria in those settings is more challenging than in high-incidence settings. Therefore traditional pharmaceutical management and health care service are not adequate to service these populations.

In February 2014, USAID/SIAPS provided technical assistance to the Suriname MOH to hold a working meeting with the Global Fund, the Pan American Health Organization, and other key local stakeholders to discuss the KAP study results and review options for improving medicine availability and access in the gold mining region of the country.<sup>7</sup> The goal was to seek solutions to address poor access to and use of antimalarials and to devise initiatives that could improve the situation. Participants developed innovative and appropriate initiatives to improve access to diagnosis and treatment in the remote populations and hot spots of the country. The initiatives focused on local, national and regional level strategies, as shown in tables 1, 2, and 3.

<sup>8</sup>Carter, Keith. Situation and Challenges of Malaria in Latin America and the Caribbean. 04/09/2013.

**Table 1. Local Strategies**

Technical Area	Activity
Improve adherence to a full treatment course of antimalarials	Develop picture guidelines for treatment regimens
Improve access and availability of diagnostic and treatment services	Establish mobile diagnostic and treatment centers (i.e., using boats, all-terrain vehicles, or both)

*Note:* At the local level, the focus should be on piloting innovative interventions to assure a continuous supply of quality assured medicines in those remote areas (such as the basic malaria survival kit that is currently being explored for distribution to gold mining populations).

**Table 2. National Strategies**

Technical Area	Activity
Improve adherence to a full treatment course of antimalarials	Conduct marketing campaigns to improve adherence to treatment
	Strengthen malaria service deliverer capacity
Improve access and availability of diagnostic and treatment services	Improve Portuguese language services in remote areas
	Publicize approved treatment availability at the medical mission clinics and malaria service deliverers in the remote areas and hot spots
	Improve supply chain management with national forecasting and standard operating procedures
	Improve malaria service deliverer performance by creating job aids, standard operating procedures, and a supervision system

**Table 3. Regional Strategies**

Technical Area	Activity
Improve adherence to a full treatment course of antimalarials	Conduct an international malaria treatment campaign in Portuguese
Allow over-the-counter malaria treatment	Study the possibilities of self-diagnosis and treatment
Improve access to and availability of diagnostic and treatment services	Participate in the regional monitoring system for antimalarials

*Note:* The USAID Amazon Malaria Initiative (AMI) support at the regional level should focus on strategies to contain emergence of resistance in malaria hot spots.

## Conclusion

It is important to build an evidence-based approach to justify the launch of new interventions and to evaluate their impact. These tools designed at the Suriname KAP study meeting could be adapted and customized to countries in the Latin American and Caribbean/AMI region and other regions that face similar challenges.

AMI is advocating a systematic implementation of locally appropriate interventions and documentation of results. The lessons learned from these experiences will be useful for malaria control in other areas and will hopefully contribute to expanding the malaria-free areas in the Americas and globally.