RESEARCH PROTOCOL for the: KAP study of Malaria treatment in Suriname
08/2013
Research Protocol for the KAP study of malaria treatment in Suriname

Marieke Heemskerk
Celine Duijves

08/2013
This report is made possible by the generous support of the American people through the US Agency for International Development (USAID), under the terms of cooperative agreement number AID-OAA-A-11-00021. The contents are the responsibility of Management Sciences for Health and do not necessarily reflect the views of USAID or the United States Government.

**About SIAPS**

The goal of the Systems for Improved Access to Pharmaceuticals and Services (SIAPS) Program is to assure the availability of quality pharmaceutical products and effective pharmaceutical services to achieve desired health outcomes. Toward this end, the SIAPS result areas include improving governance, building capacity for pharmaceutical management and services, addressing information needed for decision-making in the pharmaceutical sector, strengthening financing strategies and mechanisms to improve access to medicines, and increasing quality pharmaceutical services.

**Recommended Citation**

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


---

Systems for Improved Access to Pharmaceuticals and Services  
Center for Pharmaceutical Management  
Management Sciences for Health  
4301 North Fairfax Drive, Suite 400  
Arlington, VA 22203 USA  
Telephone: 703.524.6575  
Fax: 703.524.7898  
E-mail: siaps@msh.org  
Web: www.siapsprogram.org
## CONTENTS

Acronyms, Abbreviations and foreign words ................................................................. iv

1. Introduction .................................................................................................................. 5
   1.1 Background ........................................................................................................... 5
   1.2 Study objectives .................................................................................................. 6

2. Methodology ............................................................................................................... 7
   2.1 Approach ............................................................................................................... 7
   2.2 Location ................................................................................................................. 7
   2.3 Data collection instruments .................................................................................. 9
   2.4 Sample ................................................................................................................... 10
   2.5 Indicators and sources of information ................................................................. 11
   2.6 Data collection procedures in the field ................................................................. 12
   2.7 Processing and analysis of data .......................................................................... 14

3. Report outline ............................................................................................................. 15

Annex A. Research instruments ..................................................................................... 16
   1. Malaria Questionnaire ......................................................................................... 17
   2. Questions for people taking preventive medication ............................................. 17
   3. Interview guide health workers ......................................................................... 24
   4. Interview guide for medication sellers ............................................................... 24
   5. Focus Group guide ............................................................................................. 28
   6. Audit Sheet .......................................................................................................... 28

Annex B. Informed Consent Statement ....................................................................... 33
# ACRONYMS, ABBREVIATIONS AND FOREIGN WORDS

<table>
<thead>
<tr>
<th>Acronym</th>
<th>Definition</th>
</tr>
</thead>
<tbody>
<tr>
<td>ACD</td>
<td>Active case detection</td>
</tr>
<tr>
<td>curatela</td>
<td>Gold miners’ settlement (Portuguese)</td>
</tr>
<tr>
<td>Global Fund</td>
<td>Global Fund to fight Aids: Malaria and Tuberculosis</td>
</tr>
<tr>
<td>GOS</td>
<td>Government of Suriname</td>
</tr>
<tr>
<td>ITNs</td>
<td>Insecticide treated (bed)nets</td>
</tr>
<tr>
<td>KAP</td>
<td>Knowledge, Attitudes and Practices</td>
</tr>
<tr>
<td>MSD</td>
<td>Malaria service deliverer</td>
</tr>
<tr>
<td>LLINs</td>
<td>Long-lasting insecticide-impregnated nets</td>
</tr>
<tr>
<td>PAHO</td>
<td>Pan American Health Organization</td>
</tr>
<tr>
<td>RAVReDA</td>
<td>Red Amazonica para la Vigilancia de la Resistencia a los Antimalaricos (Amazon Network for the Surveillance of Anti-malarial Drug Resistance)</td>
</tr>
<tr>
<td>WHO</td>
<td>World Health Organization</td>
</tr>
</tbody>
</table>
1. INTRODUCTION

1.1 Background

This research protocol describes the background, objectives of the study, methodology and the data collection instruments for the study on the knowledge, attitudes and practices of malaria and malaria treatment in the small-scale gold mining sector in Suriname, hereafter referred to as KAP study. The KAP study is commissioned by PAHO in collaboration with the Government of Suriname (GOS)/Global Fund “Searching for gold, finding malaria” program and Management Sciences for Health (MSH).

This study does not stand on itself. In 2008, the Government of Suriname Ministry of Health signed a grant agreement with Global Fund to execute a project entitled “Searching for gold, finding malaria”. This program was a follow-up from an earlier Global Fund funded anti-malaria program, which had resulted in the virtual elimination of malaria from interior villages by 2007. However, the disease continued to plague small-scale gold mining areas.

The “Searching for gold, finding malaria” program started in 2009, with as its main purpose to eradicate malaria in Suriname’s small-scale gold mining areas, and thereby prevent a relapse of this disease in interior villages. The main program activities are ongoing and include free testing and treatment of people with malaria symptoms in the small-scale gold mining areas; Active Case Detection (ACD); an information and awareness campaign; and the free distribution of Insecticide Treated Bed Nets (ITBN) in small-scale gold mining areas.

In 2009-10, the first malaria KAP study in small-scale gold mining areas concluded that non-treatment, incorrect or incomplete malaria treatment, and undiagnosed treatment with over-the-counter medicine occurred frequently. Many people had bought over the counter medicine (18.0%) and not finished the prescribed doses of medicine (19.4%). In 2012, an evaluation study found that as compared to 2009, overall malaria knowledge among gold mining area inhabitants had increased. Nevertheless, treatment behavior remained sub-standard. Only 38.6 percent of interviewees reported that they had used the services of a government health clinic the last time they had malaria; 37 percent of respondents in gold mining areas named the malaria program Malaria Service Deliverers as a location where one can test for malaria; and only 20.1 percent of respondents had used the services of an MSD the last time they had malaria.

These findings, informal conversations with gold miners, and observations of health specialists suggest that inhabitants of small-scale gold mining areas do not adhere to prescribed treatment regimes. They do not always test for malaria when they believe they have the disease; they take over-the-counter medication; they discontinue treatments once they feel better; and they take haphazard preventative medication. These facts highlight a need to design and implement interventions that enable the mining population to access and use approved antimalarials in the correct way. However, gaps remain in assessing and understanding the reasons for treatment seeking behaviors in the mining population. The present study will document malaria treatment seeking behaviors and thereby provide a better understanding of the knowledge, attitudes and practices in mining areas with regard to malaria treatment.
1.2 Study objectives

In order to completely eradicate malaria in Suriname, it is important that gold miners and other inhabitants of gold mining areas test for malaria, use the prescribed treatment, and use the treatment correctly. The Government of Suriname malaria program aims to launch an intervention campaign to motivate gold miners to improve their treatment behavior.

In this context, the objective of the present study is collect baseline data on malaria treatment behavior in small-scale gold mining areas as well as information that can be used to design an intervention campaign. This will contribute to the broader goal of improving access to adequate treatment and adherence to treatment regimes in gold mining areas and Paramaribo, and thus contribute to the eradication of malaria in Suriname. The specific objectives for the KAP study are to:

- Map access to malaria medication, using four dimensions of access including physical availability, affordability, acceptability and geographic accessibility
- Provide an informed estimate of the magnitude of the population accessing malaria medication through unofficial channels, for both prevention and treatment of malaria;
- Identify what different types of medication (incl. traditional medication) the inhabitants of gold mining areas use to treat malaria;
- Determine where patients access treatment for malaria and other common conditions of patients in the identified study population in the gold mining region and Paramaribo;
- Assess malaria patients’ preventive and curative malaria medicine-intake behavior, including whether they complete treatment.
- Determine factors contributing to the identified treatment seeking behaviors.
2. METHODOLOGY

2.1 Approach

The research has a mixed method design that integrates qualitative methods with quantitative measures of different aspects of treatment seeking behavior. Qualitative methods, such as in-depth interviews with open questions, observations and focus groups will provide rich information about the logic behind treatment behavior and general patterns of treatment behavior observed by health care providers. They will help identify the different types of medication on the market, and people’s justifications for using certain types of medication. The information is cannot easily be generalized though.

Quantitative data can provide us with an estimate of what proportion of individuals who contract malaria in the mining areas make use of illegal medicines or use certain types of treatment, what locations for accessing treatment for malaria are relatively more popular, and how these behaviors vary in people who differ in nationality, working location and age, among other factors. The use of both qualitative and quantitative research will provide a richer understanding and we expect the two kinds of data to complement one another.

The research team is headed by two anthropologists, who will rely on the assistance of approximately four surveyors who are not MSDs, to prevent bias. Both the lead researchers and some of the surveyors are trained in testing for malaria and will offer their service during fieldwork. Inhabitants who are in need of a malaria test can be tested by the team. We foresee that especially people in Oelemari will make use of this service, because this location is isolated and there are no MSD working in the area.

2.2 Location

The KAP study will be conducted in two small-scale gold mining areas (Figure 1):

• Benzdorp general area (incl. Cabanavo, Peruano and Antonio do Brinco),
• Oelemari

These locations were selected because of the expected presence of persons who have had malaria in the past year. This expectation is based on the database of PAHO/Malaria Program, recommendations from malaria program staff, and informal reports from gold miners working in these areas.

The Benzdorp general area was also selected because it is situated along the border with French Guiana and many gold miners and mining service providers living in this area work (partially) in French Guiana. In the past year, most gold miners and mining service providers who tested positive for malaria in Suriname had actually -most likely- obtained the disease in French Guiana. The Suriname-French Guiana border has the highest malaria rates in Suriname. The Benzdorp general area was also selected among the study locations because the GOS malaria program has been active in this area for four years now, and several MSD are stationed in this area. The study will provide insight in whether, why and how inhabitants of gold mining areas use the services of the malaria program in general, and those of the MSD in particular. The Benzdorp area, including the various satellite settlements, may house approximately 2,000 gold miners and mining service providers.
Figure 1. Approximate locations of the study areas

Suriname: Mining Regions, Districts & Zones

[Map showing approximate locations of study areas, including Benzordorp and Oelemari.]
Oelemari is an interesting area for the study because it is a relatively new and booming, yet poorly known, mining area. To the consultant’s knowledge no earlier studies have been carried out in this area and the GOS malaria program is not active in this location. Oelemari is also interesting because it is a rather isolated site, and it is difficult for gold miners in this area to reach a medical doctor. Therefore the chances that gold miners in this area revert to auto-medication are relatively high. The manager of the Oelemari concession estimated the population of gold miners at this location at 150 (Fraser, pers. com 9 Aug. 2013). Including the mining service providers the population may amount to 300.

2.3 Data collection instruments

The following data collection instruments have been designed (Annex A):

I. **Survey forms**: We will design questionnaires for interviews with small-scale gold miners and others living and/or working in gold mining areas. The form will contain mostly closed questions and a few open-ended questions. The survey form will be composed in the Dutch, English and Portuguese language and administration of these questionnaires should not take more than 20 minutes.

II. **Interview guide for interviews with people taking preventive medication**: We will ask more detailed questions about the use of preventive medication to persons who have used such medication in the past year. These people will be targeted as a separate group because they may be excluded from the survey because of its inclusion criteria.

III. **Focus group guide**: A guide for focus group discussions will be developed. Focus groups discussions will last approximately one hour.

IV. **Interview guide for qualitative interviews with health service providers**: These questions will be large open-ended and ask about the knowledge, attitude and behavior of the target group and of the service deliverers. Among others, patient adherence, the degree to which patients follow medical advice and take medicines as directed, and barriers that reduce the ability to provide infected individuals with the prompt effective treatment necessary to reduce death and illness from malaria will be discussed.

V. **Interview guide for qualitative interviews with drugs sellers**: Questions will be asked about the types of malaria medications that are sold, the sources of these medicines, prices, and preferences. In addition, the researchers will ask about the types of instructions that are given to buyers of medication.

VI. **Audit sheet**: A one page data sheet to record basic characteristics of the mine site in the larger mining areas, including geographic coordinates, demographic information, availability of health and other public services, and accessibility of malaria services. This information will be collected through interviews with local leaders, concession holders or managers, and/or people with a long history in the area, combined with observation.
2.4 Sample

The total number of persons working in the Suriname gold mining regions is not known, but has been estimated by the Commission Regulation Gold Sector (OGS) at 40,000 individuals (De Ware Tijd, 3 March 2012). This population estimate includes mining service providers such as cooks, All Terrain Vehicle-drivers, sex workers, shop-owners and others working in the mining areas.

We seek the participation of a total of 200 individuals in the two selected mining regions: the Benzdorp mining area including the settlements Benzdorp curatela, Cabanavo, Peruano, Antonio do Brinco (N=150) and surrounding mining camps, and the Oelemari mining area (N=50). We focus on a maximum spread of survey participants within the two mining regions. Because of budget constraints, it was not possible to visit more than two gold mining regions. Given our inclusion criteria (see below), the largest share of the population of these mining regions is not part of the sample population, and we expect that a number of 200 is feasible. Gold miners in Paramaribo will only be interviewed to test the survey forms.

Even though the survey sample is rather small, in combination with the various other groups that will be interviewed, the data will provide accurate and interesting insights into the situation of malaria medication use in the gold mining areas.

The inclusion criteria for survey participation are:

a) The person is working and/or living in a small-scale gold mining area in Suriname, AND

b) The person has been ill with malaria, or suspects that he/she has been ill with malaria, in Suriname in the past year, regardless of whether the malaria was proven by a test.

We chose to include only people who have had (suspected) malaria in the past year because people will not accurately remember their behavior in response to malaria over a more extensive period. If we discover on the first day of our fieldwork that this time span is too small, we will look for people who have had (suspected) malaria in the past two years. We will only include persons who had (suspected) malaria in Suriname because the study is primarily concerned with the behavior of gold mining area residents in Suriname, and not with the past behavior of gold miners in Brazil or other countries.

A registration system of malaria occurrence exists but cannot be used as a sample frame because it will be merely impossible to find the patients back, given their mobility. Moreover, using the database of registered malaria cases would exclude people who did not take a formal malaria test in Suriname when they last had malaria, for example because they relied on auto-medication or got tested in French Guiana. For the mentioned reasons, the selection will take place by both opportunist encounters and snowball sampling, that is, recommendation by other participants. The consequence of using this type of sampling design is that we cannot extrapolate our results to the small-scale gold mining population at large.

We will select respondents through purposive stratified sampling, aiming to interview and test individuals from different nationalities, sex and age. This approach allows the researchers to expose the heterogeneity among people in the mining area and diversity in their knowledge, attitude and behavior. Because of the small number of persons working in
Oelemari, the team will make an effort to approach every person present in this area to detect whether he or she meets the inclusion criteria.

At every field visit, the lead researches will supervise the survey work to guarantee the quality of work.

2.5 **Indicators and sources of information**

The consultant developed indicators for this KAP study based on:
- Terms of Reference
- Previous studies
- Input of Global Fund and Ministry of Health

<table>
<thead>
<tr>
<th>Indicators</th>
</tr>
</thead>
<tbody>
<tr>
<td>% of interviewed inhabitants of selected gold mining areas who went testing for malaria in the past year when suspecting to have malaria</td>
</tr>
<tr>
<td>% of interviewed inhabitants of selected gold mining areas who know what kind of malaria they contracted in the past year</td>
</tr>
<tr>
<td>% of interviewed inhabitants of selected gold mining areas who have knowledge of the different types of malaria in Suriname</td>
</tr>
<tr>
<td>% of interviewed inhabitants of selected gold mining areas that used malaria medication without prescription in the past year</td>
</tr>
<tr>
<td>% of interviewed inhabitants of selected gold mining areas who fully understands how to use prescribed malaria medication in the past year</td>
</tr>
<tr>
<td>% of interviewed inhabitants of selected gold mining areas who did not complete treatment in the past year</td>
</tr>
<tr>
<td>% of interviewed inhabitants of selected gold mining areas who use preventive medication against malaria in the past year</td>
</tr>
<tr>
<td>% of interviewed inhabitants of selected gold mining areas who have bought malaria medication in the shop/pharmacy without prescription in the past year?</td>
</tr>
<tr>
<td>% of interviewed inhabitants of selected gold mining areas who are sleeping under a (Insecticide Treated) net in the previous night (Global Fund indicators)</td>
</tr>
<tr>
<td>% of interviewed inhabitants of selected gold mining areas with adequate knowledge about the cause, symptoms, prevention, and treatment of malaria (Global Fund Indicator)</td>
</tr>
<tr>
<td>% of interviewed inhabitants of selected gold mining areas who demonstrate correct treatment behavior a) they go testing b) they don't take automedication c) they finished their cure the last time they had malaria.</td>
</tr>
<tr>
<td>% of interviewed inhabitants of selected gold mining areas who bought any over-the-counter medication other than malaria medication</td>
</tr>
</tbody>
</table>
2.5 Data collection procedures in the field

2.5.1 Surveys
The researchers will conduct a quantitative survey with both open-ended and closed-ended questions with small-scale gold miners. This survey will take approximately 20-30 minutes to complete and contain the following sections:

Demographics and personal background: Questions about the respondent’s demographic background including age, sex, nationality, language skills, literacy and migration behavior.

Working conditions: Questions about working locations in the past year; current primary working location; type(s) of work currently performing.
Malaria history: Number of malaria episodes in the past year; date and location of most recent malaria episode.
Malaria treatment: Access to malaria service providers in Suriname or French Guiana; prices of malaria treatment (medication, health service, transportation); actions undertaken in response to the most recent malaria episode; motivation for this action; type of treatment taken; completion of treatment; experience with treatment failure.

Auto-medication: Use of over-the-counter medication; access to medication; motivations for auto-medication.

The lead researchers will test surveys prior to their use in the field, with at least three gold miners and mining service providers who seek the service of the Tourtonnen malaria clinic and/or with gold miners in Brokopondo. These test surveys will be excluded from the survey sample. In the study locations, the surveys will be conducted by experienced and trained surveyors who are fluent in Portuguese and/or Sranantongo. The lead researchers will control every completed survey form to ensure high data quality.

Malaria prevention: Use of LLNs; use of prophylaxis or other preventative medication

2.5.2 Focus groups
On different locations, Focus Group Discussions will be organized with a mixed group of people. We have planned for a total of four focus groups, with approximately six to eight participants per group. In selecting focus group participants, we will aim for diversity in professions, sex, age and nationality. Potential participants need to be in the area for at least half a year, but they do not need to have had malaria recently. Whereas the survey interviews will extract information about personal experiences with malaria, the focus group is conducted to obtain insights in general behavioral patterns that people see around them; in their family, and among colleagues and friends. We expect that this approach will generate relevant additional data because people may find it easier to speak about general involvement in illicit medicine use in the location (e.g. “gold miners who feel ill with malaria prefer to buy coartem”) than about their own involvement in such practices (e.g. “I bought coartem last month when I suspected to have malaria”). At least one of the focus groups will be conducted with Sranantongo speakers.

The focus groups will be conducted by at least one of the lead researchers, assisted by one of the surveyors or the other lead researcher. One of the lead researchers and all surveyors are
fluent in Portuguese, and all members of the research team speak Sranantongo. Focus groups can be held in any available and suitable location, such as a brothel or bar in day-time when it is quiet. Approval of the location owner will be obtained.

The purpose of the focus groups is to obtain more detailed qualitative data about behavioral strategies of the focus group participants and their colleagues. Questions will focus on treatment behavior, including questions concerning:

- The various strategies used to prevent malaria in their mining area, incl. the use of malaria prophylaxis
- Knowledge of the fact that there are two different types of malaria that require different treatment regimes.
- The availability, affordability and use of over-the-counter medication; types and reasons.
- The types of malaria medication that are available, affordable, used and/or popular in their mining area
- The reasons for testing or not testing for malaria when suspecting to be ill
- Experiences with different types of medication
- Completing medication and sharing ‘left-over’ medication

2.5.3 Qualitative interviews

The research team will conduct structured qualitative interviews with persons living and working in the gold mining area who use preventive medication, to obtain a more-in depth understanding of people’s motivations behind medicine use. At present not much is known about these practices in the Suriname gold mining areas.

Qualitative interviews will also be conducted with health service providers and the owners of businesses selling malaria medication in the mining areas, including supermarkets and pharmacies. These interviews will focus on their perspectives with regard to the types of medication sold, their own sources of these medicines, and the most popular medicines. In addition, we will ask the persons selling malaria medication whether they know how the medication must be used and if so, whether they explain this to the patient.

2.6 Protection of Human Subjects and Ethical Review

Research procedures will adhere to professional ethical standards for anthropological and health research. Validation of the research protocol and ethical approval have been obtained by the Ministry of Health.

During fieldwork, potential respondents will be approached by an individual survey worker or the lead researcher in an unobtrusive manner. The researchers will explain each potential participant the context and goals of the study, and explain his or her rights through an oral Informed Consent procure. Study participants will remain anonymous. Information provided by the respondent to the research team will be treated confidentially. All data and test results will be presented in an aggravated manner.
Annex B lists text that will be used to ask potential study participants for their participation and informed consent\(^1\). The text will be spoken to the person in his or her mother tongue. Particularly in the Benzdorp area, it is likely that the research team will also encounter children of various ages, who live in the miners’ settlement (curatela) with their parent(s). If we encounter a person under 18 who meets the inclusion criteria, we will ask Consent from the parent or legal guardian. In the case of children between 15 and 17 years of age, the child him- or herself will be approached for an interview, in the presence of a parent or legal guardian. In the case of children younger than 15 years of age, the interview will take place with the parent or legal guardian. If there is no parent or legal guardian present to grant the consent, we will seek consent from the adults responsible for the child, such as an uncle or another guardian.

Upon completion of the survey or qualitative interview, the respondents will receive a 10 USD calling card compensation for their time.

2.7 Processing and analysis of data

A trained data entry assistant will enter the data in the statistical software package SPSS for analysis. The researchers will use both summary statistics and bivariate statistics to explore determinants of knowledge, attitude and behavior of the target group. Bivariate analyses will serve to detect relations between the different variables.

A draft report incorporating all data analysis will be presented in written form to PAHO by October 22\(^{th}\) 2013. After submission of this first draft, a results review and consensus meeting with stakeholders will be held and comments on the written draft report will be integrated in the final report, which will be submitted by October 31\(^{st}\).

---

\(^1\)Based on Stanford University Research Consent Form for Minimal Risk Medical Human Subject Research
3. REPORT OUTLINE

The report will be structured as follows:

**Chapter 1:** This section provides an introduction to and description of the proposed KAP study and explains the purpose and structure of this report.

**Chapter 2** offers a background, including baseline information on malaria in Suriname.

**Chapter 3** presents the methods used for data collection and analysis. This chapter also describes the study population and the survey sample.

**Chapter 4** contains the survey results, which are organized according to thematic areas including a background on the study locations; the demographic and social profile of the study population; knowledge and perceptions of malaria; treatment seeking behavior; use of treatment; access to treatment; use of (illegal) medicines; bed net usage.

**Chapter 5** provides an overview of the various malaria service deliverers and health service providers in the interior and health professionals in Paramaribo. The information in this chapter is largely based on qualitative interviews with these stakeholders.

In **chapter 6**, the consultant discusses the results in more detail and provides a conclusion with regard to assessing and understanding the reasons for the treatment seeking behaviors in the mining populations and the access and use of approved antimalarials and medicines.

The final **chapter 7** contains recommendations as a follow up to the conclusions.

Bulky data including the data collection instruments will be placed together in the annexes.
ANNEX A. RESEARCH INSTRUMENTS

The following research instruments are attached:

1. Malaria questionnaire
2. An interview guide for short interviews with people taking preventive medication
3. Interview guide health workers
4. Interview guide medication sellers (mainly owners of supermarkets and pharmacies)
5. Focus group guide
6. Audit sheet
1. **Malaria Questionnaire**

**Inclusion of interviewee:** Ask the below question to determine whether the person should be included/continue to be interviewed, or not

Did you have, or suspect you had, malaria in the past 1½ year (2012-2013)?

1. Yes  
2. No (Participant is not part of the target group. Discontinue the interview)

Date: _________________________  Location: ___________________________________

**GENERAL DEMOGRAPHIC AND SOCIOECONOMIC INFORMATION**

1. Gender (circle) : 0 = Female  1 = Male

2. What is your date of birth (insert: day/month/year) : . . / . . / . . . .

3. Where were you born?
   1. Suriname  
   2. Brazil  
   3. Guyana  
   4. Dominican Republic  
   5. French Guiana  
   6. China  
   7. Other:_____________________

4. What do you do in the mining area at this moment (Circle all that apply)
   1. Gold miner (worker)  
   2. Gold miner (machine owner)  
   3. Sex worker  
   4. Transport provider  
   5. Brothel owner  
   6. Shop employee  
   7. Shop owner  
   8. Housewife  
   9. Unemployed  
   10. Travelling vendor  
   11. Other: _______________

5. How long have you been working in gold mining?
   1. < 1 year  
   2. 1-3 years  
   3. 4-7 years  
   4. > 7 years

6. In what countries have you been working in the gold mining sector in the past 1½ years (2012-2013)?

   (more than one answer possible; circle all applicable answers)
   1. Suriname  
   2. French Guiana  
   3. Brazil  
   4. Guyana  
   5. Other:_____________________

7. In how many gold mining areas in Suriname did you work or live for more than a month in the past three years?
   1. Only 1  
   2. 2-3  
   3. 4-6  
   4. More than 6

8. What is your highest level of formal education?

<table>
<thead>
<tr>
<th>Level</th>
<th>Completed</th>
<th>Not completed</th>
</tr>
</thead>
<tbody>
<tr>
<td>Primário/GLO</td>
<td>1</td>
<td>2</td>
</tr>
<tr>
<td>Secondário/VOJ</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>Tercero/VOS etc.</td>
<td>5</td>
<td>6</td>
</tr>
</tbody>
</table>

7. No education  
8. Don't know  
9. Other:_____________________

9. What languages do you speak?

<table>
<thead>
<tr>
<th>Language</th>
<th>Yes, fluently</th>
<th>I understand a little</th>
<th>Hardly/not at all</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dutch</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Sranantongo</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>English</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Portuguese</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>French</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

GENERAL MALARIA KNOWLEDGE AND EXPERIENCE WITH MALARIA

10. What is the cause of malaria? (circle all that apply – do NOT read out the answers to the interviewee)

1. Bite of a (malaria) mosquito
2. Drinking dirty water (river/creek)
3. Being near to dirty water
4. Dirty surroundings (trash)
5. Other:________________

11. Can you name symptoms of malaria? (circle all that apply – do NOT read the answers)

1. Headache
2. Fever
3. Feeling cold/shivering
4. Feeling weak/tired
5. Throwing up/Nausea
6. Bitter taste
7. No appetite
8. Diarrhea
9. Joint pains
10. Body pain
11. Don’t know
12. Other

12. Can you indicate whether the following statements are true or false?

<table>
<thead>
<tr>
<th>Statement</th>
<th>TRUE</th>
<th>FALSE</th>
<th>Don’t know</th>
</tr>
</thead>
<tbody>
<tr>
<td>a. You can stop malaria treatment as soon as you feel better</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>b. Malaria can kill people</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>c. Malaria medication from Brazil is better than that from Suriname</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>d. Malaria medication from French Guiana is better than that from Suriname</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>e. When tested negative for malaria it is wise to take malaria medication anyway, just to be sure</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

13. How often have you been ill with malaria in the past 1 ½ year (2012-2013)?

1. Once (1 time)
2. 2 to 3 times
3. 4 to 5 times
4. more than 5 times
5. Don't know

14. The last time you were ill with malaria, in what country were you?

1. Suriname
2. Brazil
3. Guyana
4. French Guiana
5. Other country:________________

15. When is the last time you were ill with malaria?

1. In this past month
2. In the last 1-6 months
3. 7-12 months ago
4. More than a year ago
5. Don't know

16. What type of malaria was it? (Do NOT read the options to the interviewee)

1. Falciparum
2. Vivax
3. Mixed infection
4. Don't know
5. Other, namely:__________________________________
MALARIA PREVENTION

17. How can one protect oneself against malaria?
1. Sleep under bed net
2. Use preventive medication (bita)
3. Use mosquito candle
4. Use Baygon etc. (insect spray)
5. Use repellent
6. Stay away from dirty water
7. Keep your area clean
8. Don’t drink dirty water (creek/river)
9. Don’t know
10. Other________________

18. Did you sleep under a bed net last night?
1. Yes
2. No
3. I don’t know

19. If you slept under a bed net last night, was that bed net impregnated? That is, was the bed net the type that is treated with a chemical that repels and/or kills mosquitoes?
1. Yes
2. No
3. I don’t know
4. Did not sleep under a bed net

20. Which medicines do you take at this moment or did you take in the past 1 ½ year (2012-2013) to protect yourself against malaria? (incl. bita etc).
1. I did not use preventive medication
2. I used Artecom
3. I used: ________________________
4. I Forgot the name (try to describe)__________
5. Can’t remember
6. _______________________________

Questions 21-26 only apply to people using preventive medication

21. If you have preventive medication with you; can I see it?
Write name of the medicine:
_____________________________________________________________

22. Where did or do you obtain the preventive medication?
1. Store or supermarket in the mining areas
2. Pharmacy in the mining areas
3. Supermarket in Paramaribo (e.g. Transamerica)
4. Pharmacy in Paramaribo
5. Health facility, namely (write name of the health facility):
6. Other source (specify):
_____________________________________________________________

23. What were the reasons you started to use preventive medication?
1. I got malaria several times and I do not want to get it again
2. People in my surrounding had malaria
3. It makes me feel better/stronger
4. Other: _____________________________________________________________________

24. What has been the effect of preventive medication; does it work?
1. Yes, because: _____________________________________________________________
2. No, because: ________________________________________________________________________

25. Have you experienced side effects of this preventive medication?
1. Yes, Itching
2. Yes, skin problems (rashes, dark spots etc)
3. Yes, other: ___________________
4. No

26. Have you recommended taking preventive medication to your friends/family?
1. Yes, because: _______________________________________________________________________
2. No, because: ________________________________________________________________________
MALARIA TREATMENT

27. What strategies have you used to get better when you had malaria in the past 1½ year (2012-2013)? (Circle all that apply)
   1. Nothing
   2. Go for a test
   3. Use auto medication
   4. Other________________________________________

Questions 28-35 only apply to people taking auto-medication

28. In the past year (2012-2013), which anti malarials have you used to cure malaria (only auto-medication, not prescribed)? Use picture chart (Circle all that apply)
   1. Coartem
   2. Coartem + Primaquine
   3. Chloroquine
   4. Primaquine
   5. Chloroquine + Primaquine
   6. Artecom
   7. Anate
   8. Adesunate
   9. Lariam/Mefloquine
   10. Artemisinin
   11. Coartem.
   12. Other;________________________
   13. Don't know

29. Are you currently taking medicines to cure malaria?
   1. Yes
   2. No

30. If you have malaria medicines with you; can I see it? Write name of the medication: ___________________________________________________________

31. Where did or do you obtain medicines against malaria the last time you needed them?
   1. Supermarket in the mining areas
   2. Pharmacy in the mining areas
   3. Supermarket in Paramaribo (e.g. Transamerica)
   4. Other: ___________________________

32. What were the reasons you started to treat yourself without seeing a health professional or health worker, the last time you did this?
   1. I got malaria but I tested negative and the health worker did not want to provide medication.
   2. I was too far away from a health post when I had malaria, and it would be too costly and/or time consuming to go see a health worker/MSD and take the test.
   3. I knew/suspected I had malaria and I did not want to bother to take the test
   4. The medication I bought works better than the one the health workers give.
   5. Other reason: ___________________________________________________________

33. What has been the effect of the medication you bought; did it work?
   1. Yes, because: ___________________________________________________________
   2. No, because: ___________________________________________________________

34. Have you experienced side effects of this medication?
   1. Yes, such as___________________________________________________________
   2. No

35. Have you recommended self-medication to your friends/family?
   1. Yes, because: ___________________________________________________________
   2. No, because: ___________________________________________________________
36. Do you know where to go for testing and treatment of malaria in Suriname? If yes, please state where? (Please circle all answers that are mentioned but do NOT READ the ANSWERS to the interviewee)

1. MSD  
2. Health clinic MZ  
3. Malaria Lab Tourtonne  
4. BOG  
5. General clinic/Practitioner  
6. Don’t know where to go  
7. Hospital  
8. Brahma/Medilab  
9. Other

37. Did you get tested the last time you suspected to have malaria?

1. Yes, by an MSD  
2. Yes, by health worker in Fr Guiana  
3. Yes, by MZ  
4. Yes, in official test location in Paramaribo (e.g. Tourtonnen lab; Brahma)  
5. Yes, by a health worker in Brazil  
6. No I did not go for a test

If YES, go to 38; if NO, go to 40

38. If yes, why there?(circle all that apply)

1. Nearest place  
2. Good medical care  
3. Recommendations of others  
4. Good price/Free  
5. Speak my language  
6. Friendly staff  
7. Quick results  
8. I trust them to be professional/good  
9. Other;______________

39. Did you test positive?

1. Yes – Go to Question 41  
2. No – Go to question 43

40. If you did not go testing, why did you not go for testing?(circle all that apply)

1. I knew my status without testing  
2. Too far from health services  
3. Results take too much time  
4. Bad experiences in the past  
5. No MSD in the area  
6. Takes too much time to get there  
7. Financial reasons  
8. I take medication anyway, namely________________  
9. Other________________________

Go to Question 44

41. If tested positive, did you directly obtain medication from the health worker/MSD?

1. Yes, I directly received medication.  
2. No, I got a prescription  
3. No, I didn't receive anything  
4. Other: _________________________________

42. If you obtained medication or a prescription from the health worker the last time you had malaria, did you use this medication?

1. Yes  
2. No, because: _________________________________

Go to Question 44

43. If you were tested negative, what did you do?

1. Just waited until it would go away/until I felt better  
2. Test again  
3. Bought malaria medication over the counter in a supermarket/pharmacy
4. Obtained malaria medication from friend/acquaintance
5. Other: ____________________________________________________________________

44. The last time you took malaria medication, who gave you information on how to properly use your medication?
   1. Health worker        3. Friend        5. No one
   2. MSD                   4. Shop owner/seller 6. Someone else______________________

45. The last time you took malaria medication, did you fully understand how to use this medication, that is; what dose/how many pills per day and at what times?
   1. Yes, it was completely clear
   2. No, I did not understand everything but I asked friends and other people around me
   3. No, I did not understand everything but I went back to the health worker
   4. No, I did not understand everything but I did what I thought was right
   5. No, I did not understand everything so I discontinued treatment
   6. Other: __________________________________________________________________

46. How many pills were left when you stopped taking medication, the last time you used malaria medicine?
   1. No pills were left – Go to Question 48       3. Some pills left
   2. One pill was left                             4. Can't remember

47. Why did you have left over pills?
   1. I felt better and stopped   3. I forgot to take pills  5. Other reason:________________
   2. I experienced bad side effects 4. They did not work  6. No left over pills

48. In the past month, have you used any over-the-counter medication other than malaria medication (without prescription) in a supermarket or pharmacy?
   1. Yes - go to 49
   2. No - end of survey
   3. I don't know - end of survey

49. If Yes, what kind of illness or health problem did you use it for?
   ________________________________________________________________________________

50. What type of medication did use (more than one answer possible)?
   1. Antibiotics, such as “red-and-black”, penicillin, amoxicillin, etc.
   2. Painkillers, such as Paracetamol, Aspirin, Paracaf, Ibuprofen, etc
   3. Wound crème/antibiotic crème/anti-fungal crème/disinfectant crème
   4. Shilling oil/hot-and-cold crèmes against muscle aches
   5. Eye-drops/nose-spray/ear drops
   6. Anti-cough medication/medicines against common colds
   7. Other: ______________________________________________________________________
2. Questions for people taking preventive medication

1. Which medicines do you take at this moment or did you take in the last year (2012-2013) to protect yourself against malaria? (incl. bita etc).
   1. I did not use preventive medication  
   2. I used Artecom 
   3. I used: ________________________

2. If you have preventive medication with you; can I see it?
   Write name: __________________________________________________________

3. Where did or do you obtain preventive medication?
   a. Supermarket in the mining areas
   b. Pharmacy in the mining areas
   c. Supermarket in Paramaribo (e.g. Transamerica)
   d. Pharmacy in Paramaribo
   e. Other: ___________________________________________________________

4. What were the reasons you started to use preventive medication?
   1. I got malaria several times and I do not want to get it again
   2. People in my surrounding had malaria
   3. It makes me feel better/stronger
   4. Other: ___________________________________________________________

5. What has been the effect of preventive medication; does it work?
   Yes, because: _______________________________________________________
   No, because: _______________________________________________________

6. Have you experienced side effects of this preventive medication?
   Yes, such as_________________________________________________________
   No

7. Have you recommended taking preventive medication to your friends/family?
   Yes, because: _______________________________________________________
   No, because: _______________________________________________________
3. Interview guide health workers

**GENERAL INFORMATION**

1. Date: __________________  2. Location: __________________

3. Type of health service (circle): MZ clinic / French health post / Pharmacy in mining areas / MSD / Other: __________________

4. Name of health service: ____________________________

5. Function of interviewee: ____________________________

**MALARIA PREVALENCE AND PREVENTION**

6. What is the main function of this health service? What kind of services do you offer?

7. What kind of services do you offer in the area of malaria prevention, diagnosis and treatment?
   a) Active malaria awareness and education; outreach, advice, etc.
   b) Passive malaria awareness and education: availability of brochures and posters
   c) Malaria testing - rapid test
   d) Malaria testing - microscopy
   e) Extension of malaria medication to positive patients
   f) After-treatment care, such as: ____________________________
   g) Other: ____________________________

8. Do you see a lot of patients who come to test for malaria? How many times a week do you perform the malaria test?

9. How many persons have tested positive for malaria at this health post in the past month? How many of these persons were people working in gold mining areas?

**MALARIA TREATMENT**

10. What type of medication do you prescribe/give when people test positive for *M.Falciparum* or *M.Vivax*?

11. Does the patient receive these medicines immediately from you or from someone else?

12. Is any cost involved in malaria testing and/or treatment?
13. Do you have any indications (observations, patient accounts) that there are people who do not take the complete cure, that is, who do not take all pills in the pack? What makes you think that? (they come back without feeling better etc.)

14. After you have provided medication to patients, have you asked them whether they have completed the cure? If so, what did they say?

15. What reasons patients mention for not completing the cure? (they start to feel better and stop taking pills etc.)

16. Given your experience in this community, do you believe that many people use auto-medication? Could you give an estimate of the share of people who use auto-medication when they believe they have malaria, versus those who take a test? Would it be more or less than half? Just a small share(<5%)?

17. Do you think that people who test negative for malaria buy and take malaria medication anyway? Is this common behavior?

18. What types of medicines against malaria do people in this community buy over the counter?

19. What are the sources of these antimalarials?

20. Do people in this community use preventative medication against malaria? Do you know what types of medicines they use, and how they use them?
21. Apart from taking auto-medication and not completing the cure, can you give examples of other treatment behaviors that are ineffective or undesirable?

22. Are there any other things you would like to mention about malaria treatment behavior?
## 4. Interview guide for medication sellers

### GENERAL INFORMATION

1. Date: _______________________________
2. Location: _______________________________
3. Type of location: supermarket / pharmacy / bar/restaurant / other:_____________________

---

1. What languages do you speak?

<table>
<thead>
<tr>
<th>Language</th>
<th>Yes, fluently</th>
<th>I understand a little</th>
<th>Hardly/not at all</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dutch</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Sranantongo</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>English</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Portuguese</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>French</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Chinese</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

2. What do you sell, how and for what price?

<table>
<thead>
<tr>
<th>Medication</th>
<th>Being sold (Y/N)</th>
<th>Packing (box/plastic/per piece)</th>
<th>Number of pills per dose/cure/package</th>
<th>Price per pack/pc</th>
</tr>
</thead>
<tbody>
<tr>
<td>Artesunate</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Coartem</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Primaquine</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Lariam/Mefloquine</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Chloroquine</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Artemisine</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Artecom</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Other:</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Other:</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

3. What medication do you sell most often?

1. Artesunate  
2. Coartem  
3. Primaquine  
4. Lariam/Mefloquine  
5. Chloroquine  
6. Artecom  
7. Artemisine  
8. Other:____________________

4. Who supplies you with malaria medication or where and how did you get it?

---

THANK YOU
5. **Focus Group guide**

<table>
<thead>
<tr>
<th>General</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Date: __________________________</td>
<td>Location: __________________________</td>
</tr>
<tr>
<td>Number of persons in group:</td>
<td></td>
</tr>
<tr>
<td>Number of males/females:</td>
<td></td>
</tr>
<tr>
<td>Nationalities:</td>
<td></td>
</tr>
</tbody>
</table>

1. Do you know what malaria is; how you get it?

2. People talk about malaria as a disease, but is malaria one disease or are there different types that feel differently? Have you experienced different types of malaria? If there are different types, how many do you think there are?

3. What do you and your family members do to protect yourselves against malaria?

4. Do you take any medication to prevent getting malaria?

5. Is it common for people in this area to take preventive medication? Why do you think they do this?

6. What kinds of preventive medication are used in this area and where can you obtain/buy this?

7. What is the cost of preventive medication here in the gold mining areas or elsewhere (Paramaribo)?

8. When you do fall ill with malaria, what do you do?
9. We just established that there are different types of malaria. Can they be cured with the same medication? That is, do the same medicines always work, or do you need different types of medication to cure different types of malaria? How do you know what medication you need?

10. What is in your experience the best medication against malaria? Why?

11. In this region, where can you obtain this medication? What is in your opinion the best place to obtain malaria medication?

12. What does this medication cost when you buy it here in the mining area, or elsewhere (in Paramaribo, in French Guiana?)

13. In this area, where do people go for malaria testing?

14. How long does it take to get to the testing location, is it nearby and easy to reach? How much does it cost to get there?

15. What does it cost to get tested for malaria? Is the price the same in all locations?
16. Has there been a time when you thought you had malaria and didn’t get tested? Please explain.

17. Have you heard about Malaria Service Deliverers? Do you know where they are located?

18. If there is an MSD nearby, have you used their services? Why or why not?

19. When you get malaria medication you get a whole lot of pills that you need to take for several days or even two weeks in a row. Sometimes people have pills left over when they stop to take medication. When you’ve had malaria, did you take all your medicine? Why or why not?

20. Have you experienced, in your family or among your friends, that people do not take all the pills that were subscribed? Why do you think people stop taking pills before the cure is complete?

21. Do you know what can happen if you take your medication wrong or if you don't finish the treatment?

22. When you get malaria medication does the MSD/health worker explain how to use it? If you have had such an explanation, was it clear to you?
23. If there is no MSD or health worker to inform people how to use malaria medication (e.g. in the case of auto-medication), how do people know how to use this medication?

24. What do you think is important to lower malaria prevalence? What can be done here in the gold mining area? What actions are important?
6. **Audit Sheet**

1. Name general area: BENZDORP/CABANAVO/ANTONIO DO BRINCO/PERUANO/OELEMARIE / OTHER: ___________________

2. GPS location: ___________________________________________________________

3. How do people reach this area, from Paramaribo? (mode, time and price):
   __________________________________________________________________________

4. Est. number of inhabitants: ________________________________

5. Nearest general health care provider: ________________________________

6. Distance to the nearest general health provider: _______________ km

7. Time needed to travel to the nearest health care provider: _______h _______ min.

8. Costs to travel to the nearest health care provider: ___________ SRD/EUR/USD

9. Presence of MSD: Yes / No

10. Nearest place where one can test for malaria: ________________________________

11. Distance to the nearest place where one can test for malaria: _______________ km

12. Time needed to travel to the nearest place where one can test for malaria: _____h ___min

13. Site has participated in Active Case Detection from the malaria program:
   □ No, never  □ Yes, in (years): ________________________________

14. Distribution of LLN has taken place in this location: NO / YES in year:___________

15. Malaria awareness posters visible? Where? ________________________________

16. Other general observations or comments:
ANNEX B. INFORMED CONSENT STATEMENT

Good day. My name is ___________. I am involved in a study for the Government of Suriname, which is executed with support from various international organizations (PAHO, MSH, GF). This study involves an assessment of the use of malaria medication among small-scale gold miners, in support of the Ministry of Health program to eliminate malaria in Suriname. This study will be executed between August and October 2013, in different gold mining areas.

In this context, my team members and I are conducting individual and group interviews with men and women involved in small-scale mining and the surrounding service economy. The objective of the present study Its aim is to obtain a better understanding of what medication is used to prevent and cure malaria, and how these medicines are used. The results will be used by the GOS to strengthen its malaria program and to devise more effective strategies to prevent malaria, and diagnose and treat people with malaria.

We would appreciate it if we could also speak with you, in your position as a gold miner/shop owner/etc. We will be asking you about your malaria history, the strategies you use to prevent and treat malaria, and experiences and perceptions with regard to malaria and malaria treatment.

Your participation in this study is voluntary. If you allow us to conduct an interview with you, you may choose not to respond to specific questions, and you may withdraw from the interview at any time, without hard feelings or repercussions. If you decide to participate, you will be given a telephone recharge card to thank you for your time and assistance.

Your responses to the questions will be treated confidentially, and not be revealed to others in a way that links your answers to your person. The interview will be anonymous and we will not mention your name in the report.

The interview will take 30-40 minutes (2 hours in case of the focus group). Before you decide, do you have any questions about this study or about my role therein?

Are you willing to participate in an interview?