
# Malaria Private Sector RDT Project

# Provider and Consumer Qualitative Study

# Summary Report

## Kenya 2016

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## Abstract

Thus far research on perceptions of mRDTs has mainly focused on community acceptance of the mRDT and test-based diagnosis in the hands of community-level or public sector health workers. Quantitative research has been limited to comparing prescription practices by methods of malaria diagnosis as well as confirming test specificity and sensitivity. Although some studies have promising results of appropriate mRDT use and associated treatment decisions, other research has found that insufficiencies in job aides, supervision, training, treatment algorithms and/or quality assurance measures result in poor provider performance and low adherence to test results (Counihan et al. 2012, Assimwe 2012, McMorrow 2008, Msellem 2008, Uzochukwe 2011). Little has been done to identify strategies to develop these tools in order to improve patient care, and few qualitative studies have explored opportunities to enhance the implementation of mRDTs in the private sector.

A knowledge gap remains in how private providers perceive the mRDT in comparison to presumptive treatment or microscopy, and how this perception as well as the attitudes of patients and caregivers may influence their treatment decisions (Chandler 2014, Reyburn 2007). In addition little is known about what market structure, including appropriate supply channels and price-setting, would be most favourable to support adoption of mRDTs in the private sector. Although studies show that, when mRDTs are available, providers often do not treat according the mRDT results, little is known about the influencing factors that contribute to this treatment decision, including facility-level barriers and misconceptions about the test. This study seeks to fill this gap while also exploring the role of supervision and other strategies in order to improve private sector mRDT use.

The research objectives are as follows:

- To understand factors that influence malaria rapid diagnostic test (mRDT) use and associated treatment at private participating outlets (private health facilities and pharmacies) in selected districts in Kilifi, Mombasa and Kwale counties, Kenya.

- To identify opportunities for addressing barriers to malaria rapid diagnostic test (mRDT) use and treatment according to mRDT results at private participating outlets in selected areas in Kilifi, Mombasa and Kwale counties, Kenya.

- To understand how structural market factors, including price, supply chain structure, and alternative treatment sources act to facilitate or pose a barrier to adoption of malaria rapid diagnostic tests (mRDT) at private participating outlets in selected areas in Kilifi, Mombasa and Kwale counties.

A total of 40 in-depth interviews with providers and patients were conducted in the two project domains of Mombasa/Kilifi and Kwale to investigate trust in RDTs as a diagnostic tool when compared to

microscopy and presumptive treatment for malaria.

Key findings of the survey were as follows:

1. Most providers interviewed during this study reported that they started using RDTs as after receiving training from PS Kenya.
2. Preference for use of RDT was in its ease of use, and the fact that it did not require electricity and specialised personnel for correct use.
3. Though rare, providers noted that there were a few cases of invalid tests which necessitated a repeat test using either microscopy or conducting another mRDT test.
4. Providers noted several benefits to using the mRDT kits including an increase in the number of patients, ability to conduct off-site malaria testing, reduction in operational costs and patients' preference and satisfaction with the test.
5. Overall, patients/consumers reported being happy with the RDT for a number of reasons: it represented improvement in the quality of care in terms of "rapid" results, the belief that it provided objective assessment of malaria in terms of both accurate diagnosis and treatment and led to favourable clinical outcomes, patient ability to personally see and interpret the results of tests conducted.
6. Preference for PS Kenya as a supplier is reportedly based on trust for quality and the feeling that other suppliers can bring them fake products.
7. Generally, providers were satisfied with the quality of supplies received. In particular, they were pleased with the quality of instructions on the mRDT kit, the buffer, the swab, and the blood collection device.
8. Nearly three quarters of providers stated that the lancets (which are usually packed in the mRDT kit) used to prick fingers, are painful.

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## Table of Contents

## Acronyms

| | |
|---|---|
| ACT | Artemisinin Combination Therapy |
| CHQAS | County Health Quality Assurance Supervisors |
| DHS | Demographic and Health Survey |
| FIND | Foundation for Innovative New Diagnostics |
| IMCI | Integrated Management of Childhood Illnesses |
| PMI | President's Malaria Initiative |
| RDT | Rapid Diagnostic Test |
| WHO | World Health Organization |

# 1. Background and Rationale

Malaria presents a significant disease burden in Kenya, accounting for 40 percent of all outpatient hospital visits and 60,000–80,000 deaths annually (PMI 2013). Approximately 10 to 12 million clinical malaria cases are reported annually by public health services in Kenya (PMI 2013). Malaria rapid diagnostic tests (mRDTs) present a possible solution to improving case management of febrile illness; the Kenyan Ministry of Health (MoH) is in the process of increasing use of mRDTs in the public sector. However, in the private sector, where over 40% of the population in endemic countries seeks care and treatment for febrile illness, (Cibulskis 2011, Littrell) mRDTs are often either non-existent or expensive (FIND). A consortium of partners including Population Services International (PSI), Population Services Kenya (PS Kenya), and Malaria Consortium (MC) are coordinating efforts to increase availability of high quality, low-cost mRDTs in the private sector. Little is known about how private providers and the communities they serve perceive the use of this test and related treatment decisions.

Presumptive Treatment and Microscopy

Historically, the World Health Organization (WHO) recommended presumptive diagnosis of malaria for patients with fever due to the availability of inexpensive antimalarials and the lack of feasible laboratory-confirmed diagnostic testing in most endemic regions (WHO Guidelines for the Treatment of Malaria Second Edition 2010). For decades, the only practical option for parasite-based diagnosis was microscopy, an approach requiring a microscope and a well-trained microscopist in addition to reagents and other laboratory supplies that were often unavailable. Concern about growing antimalarial resistance, the shift to more expensive artemisinin combination therapies (ACT) in the mid-2000s, and the advent of quality-assured malaria rapid diagnostic tests (mRDTs) made parasite-based diagnosis both more attractive and more feasible. In 2010, WHO issued new guidelines recommending parasite-based diagnosis prior to treatment for all patients suspected of having malaria, regardless of age. However, providers in malaria endemic countries continue to presumptively diagnose and treat malaria in febrile patients (Bruxvoort 2013). Household surveys have shown that less than half of diagnosed patients actually present confirmed parasitemia (Kenya DHS 2010, Briggs 2014).

Malaria Rapid Diagnostic Tests (mRDTs)

When used appropriately, mRDTs can improve treatment for febrile patients, reducing inappropriate ACT use and increasing appropriate antibiotic use to treat non-malarial febrile illness. mRDTs can be performed at all levels of the health system, including community settings, and have 98% reliability when stored and used properly (FIND). The aim is to reduce the emergence and spread of anti-malarial drug resistance and to help identify patients who have fever but do not have malaria, so that alternative diagnoses can be made and appropriate treatment provided (WHO). This is based on evidence that it is safe to withhold anti-malarial drugs from febrile patients who test negative for malaria (Njama 2007, D'Acremont 2010). Worldwide, mRDT manufacturing has increased from 88 million in 2010 to 205 million in 2012. In 2012, mRDTs accounted for 40% of all cases tested in Kenya (World Malaria Report).

Malaria RDTs have been introduced in a variety of settings, with inconsistent findings on ease of use, provider confidence in test results, and subsequent treatment decisions. Some research indicates a reduction of ACT over-prescription after mRDT implementation, while others have found an increase in ACT prescription (Bruxvoort 2013, McMorrow 2008, Msellem 2008, Williams 2008, Hamer 2007, Uzochukwu 2011). Malaria RDTs are only cost-effective if providers treat according to test results (Shillcut 2008, Hamer 2007). However, overall findings indicate that providers tend to prescribe ACT even in cases where the mRDT result was negative (Mubi 2013, Hamer 2007, Williams 2008, Odaga 2014). A recent study conducted in Tanzania's coastal region found that in public facilities with mRDTs, only 63% of febrile patients were tested. In these facilities, 14% of patients testing negative and 28% of those not tested were given anti-malarial drugs: ACTs when available, and quinine or sulphadoxine-pyrimethamine in 18% of cases due to ACT stock-outs (Mubi 2013).

To date, research on perceptions of mRDTs has focused on community acceptance of the mRDT and test-based diagnosis in the hands of community-level or public sector health workers. Quantitative research has been limited to comparing prescription practices by methods of malaria diagnosis as well as confirming test specificity and sensitivity. Although some studies have promising results of appropriate mRDT use and associated treatment decisions, other research has found that insufficiencies in job aides, supervision, training, treatment algorithms and/or quality assurance measures result in poor provider performance and low adherence to test results (Counihan et al. 2012, Assimwe 2012, McMorrow 2008, Msellem 2008, Uzochukwe 2011). Little has been done to identify strategies to develop these tools in order to improve patient care, and few qualitative studies have explored opportunities to enhance the implementation of mRDTs in the private sector. Recently in Northeast Tanzania, an mRDT intervention package informed by formative research and behavior change theory found positive results, including improved adherence to the mRDT treatment algorithm (Chandler 2014). However, a knowledge gap remains in how private providers perceive the mRDT in comparison to presumptive treatment or microscopy, and how this perception as well as the attitudes of patients and caregivers may influence their treatment decisions (Chandler 2014, Reyburn 2007). In addition little is known about what market structure, including appropriate supply channels and price-setting, would be most favourable to support adoption of mRDTs in the private sector. Although studies show that, when mRDTs are available, providers often do not treat according the mRDT results, little is known about the influencing factors that contribute to this treatment decision, including facility-level barriers and misconceptions about the test. This study seeks to fill this gap while also exploring the role of supervision and other strategies in order to improve private sector mRDT use.

This study forms part of a larger project that is currently promoting mRDT use in the private sector in five endemic countries: Kenya, Madagascar, Nigeria, Tanzania, and Uganda. Partners include PSI, PS Kenya, the Malaria Consortium (MC), the Foundation for Innovative New Diagnostics (FIND), and WHO.

## 2. Research Objectives

**Aim 1:** To understand factors that influence malaria rapid diagnostic test (mRDT) use and associated treatment at private health facilities in selected districts in Kilifi, Mombasa and Kwale counties, Kenya.

- Identify enabling factors in participating private sector outlets that routinely use mRDTs and follow the treatment algorithm.
- Identify factors that influence provider perspectives on mRDT use and trustworthiness
- Identify factors that influence community perspectives on mRDT use and trustworthiness.
- Identify barriers to mRDT use at the facility level (barriers may be systemic, habitual, social, logistical, financial, etc.).
- In addition to the factors above, identify reasons, if any, why patients might not receive treatment according to mRDT test results.

**Aim 2:** To identify opportunities for addressing barriers to malaria rapid diagnostic test (mRDT) use and treatment according to mRDT results at participating private sector outlets in selected areas in Kilifi, Mombasa and Kwale counties, Kenya.

- Identify the strengths and limitations of supportive tools such as training, job aides, and supportive supervision.
- Identify opportunities to enhance outreach and behavior change communication efforts at private facilities in order to increase appropriate use of mRDTs and treatment according to results.

**Aim 3**: To understand how structural market factors, including price, supply chain structure, and alternative treatment sources act to facilitate or pose a barrier to adoption of malaria rapid diagnostic tests (mRDT) at participating private sector outlets in selected areas in Kilifi, Mombasa and Kwale counties.

- Identify factors that influence price-setting decisions for mRDTs and describe common price-setting strategies at private health facilities.
- Identify supplier price-setting strategies that may promote or impede the decision to adopt mRDT use at private health facilities.
- In addition to the price factors above, identity other supply chain factors that influence the decision to adopt mRDTs (factors may be related to availability and accessibility of mRDTs in the supply chain, motivations to restock mRDTs, etc).

## 3. Research Questions

The following are the research questions:

**Research Question 1:**

What factors influence the use of a malaria rapid diagnostic test and treatment according to test results at participating private sector outlets in selected areas in Kilifi, Mombasa and Kwale Counties?

**Research Question 2:**

What can be done to reduce barriers to use of a malaria rapid diagnostic test and treatment according to test results at private health facilities in selected areas in Kilifi, Mombasa and Kwale Counties?

**Research Question 3:**

What factors influence the adoption of malaria rapid diagnostic tests at private health facilities in selected areas of Kilifi, Mombasa and Kwale Counties?

# 4. Design and Methodology

## 9.1 Study Design

This was a qualitative study that is part of a larger project that is currently promoting mRDT use in the private sector in five endemic countries: Kenya, Madagascar, Nigeria, Tanzania, and Uganda.

***Data Collection Overview***

The study involved collection of data from the following sources:

- In-Depth Interviews (IDI) with providers: This entailed one-on-one interviews with owners, clinicians, lab technicians, and drug dispensary assistants.

- In-Depth Interviews (IDI) with adult patients: This entailed one-on-one interviews with adults presenting with fever or caregivers of children with fever.

Interviews were conducted by a study team recruited, trained and supervised by the PS Kenya team. All research team members received training on the study protocol and on the ethical treatment of human participants. IDIs with owners, clinicians, lab technicians, and drug dispensary assistants were conducted at their place of work or at another location convenient to the participant where privacy was assured. Interviews with adult patients was conducted in a private location near but not affiliated with the health facility. Off-site interviewing was used to help reinforce that research team members operate independent of and have no affiliation with the selected health facilities. All interviews were digitally recorded after obtaining consent of the interviewees. If an interviewee did not consent to be recorded, the interviewer took the most detailed notes possible by hand during the interview.

## 9.1 Study population

Table 1 summarizes study participants and the population from which they were drawn. As shown in the table, the sample included clinicians, laboratory technicians, and drug dispensary assistants at private participating outlets that received training on mRDT, County Health Quality Assurance Supervisors (CHQAS) who oversee mRDT use at private participating outlets, adult patients or caregivers of child patients with febrile illness who presented at these private oulets, and outlet owners. Drug dispensary assistants were included since they see patients who have already received their malaria test results and

may be a good source of information about patient concerns and behavior when they have not received a prescription for ACT due to a negative test, or when no ACT is available at the facility and the patient/care-giver wants information about where to find it outside the facility. Health facility owners who are not also clinicians were included as they may be responsible for stocking and price-setting decisions in some instances and in such cases will be an important source of information on the business decisions behind choosing to stock mRDTs. In each county, providers were classified as those that were with mRDT adherent or mRDT non-adherent based on related mystery client interviews conducted in the selected clinics and pharmacies/chemists. All participants were drawn from a population within the catchment areas of private health facilities in Kilifi, Mombasa and Kwale Counties.

All the three counties were selected for this study based on the presence of private sector facilities working with PS Kenya (Tunza Franchise Facilities) with at least one clinician who had received training in Integrated Management of Childhood Illness (IMCI). In each county, a sample of Social Franchise Facilities (Tunza) was chosen based on the presence of clinicians who have been trained in both IMCI and use of mRDTs. In a similar way, other private sector facilities were chosen with clinicians who have received IMCI training but not mRDTs use.

| **Participant Group** | **Method**[1] | **Sample Size** | **Selection method** | **Consent (Oral/Written)** |
|---|---|---|---|---|
| Outlet owners, clinicians, lab technicians, and pharmacy staff | IDI | 24 | Purposive[2] | Oral |
| Adult Patients and Caregivers | IDI | 16 | Convenience[3] | Oral |
| **Total** | | 40 | | |

## 9.1 Study procedures

The study began with IDIs of providers at the outlet level. A sample of private participating outlets, classified as adhering and non-adhering based on observations from an earlier survey that entailed sending mysery cleints to these outlets.

At each outlet, the in-charge (or owner, if the in-charge is not also the owner) was approached first to gain permission to conduct study activities at the outlet. The in-charge was then recruited to participate in the study, and the interview was scheduled at the respondent's convenience. Data collection activities were followed with staff in-charge of conducting diagnostic testing as well as patients and caregivers at the outlet. If the in-charge was not also the owner, data collection was then followed with the outlet owner. Patients or caregivers were recruited for interviews as they left the outlet. Data collectors invited patients/caregivers to participate in an interview of approximately 30-45 minutes immediately in an appropriate location away from the participating outlet. If the patient/caregiver agreed to an immediate

interview, the data collector provided them with funds (Ksh 500) to cover their transportation home at the conclusion of the interview.

*Recruitment Procedures*

Patients and caregivers fulfilling eligibility criteria were introduced to study staff, who invited them to participate and read them the recruitment script. Patients and caregivers who were interested in participating were given a handout containing details of the study, including contact information for principal investigator after consenting to participate. Interviews took place at a specified location near to but not affiliated with the participating outlet, immediately after recruitment. Patients and caregivers were assured that no outlet staff would have access to their responses.

Owners, clinicians, lab technicians, and drug dispensary/pharmacy staff from both mRDT trained and untrained private outlets were recruited by study staff in-person on the morning of data collection. Lab technicians, drug dispensary assistants, clinicians, pharmacy staff and owners who fulfill eligibility criteria were asked to participate. Study staff provided information about the study as well as the in-depth interview procedure both orally and in a handout. The study staff arranged a time to conduct the interview in a private space at the outlet at the convenience of the participant. If no private space was available at the outlet, the interviewer identified a private location outside the outlet convenient to the interviewee to conduct the interview.

*Inclusion or exclusion criteria*

Recruitment of clinicians, pharmacy staff and lab technicians took place at private facilities located in the three counties further classified into two domains. A sample was selected from PS Kenya mRDT project sites, at which pharmacy providers and lab technicians had been trained on mRDT use. To be eligible for this study, clinicians, pharmacy staff and lab technicians at these outlets must have been trained to use the mRDT. To assure as wide a range as possible of provider viewpoints, providers were recruited from facilities whose routine data showed them to adhere closely to treatment according to mRDT results and those from facilities whose routine data showed them to adhere less closely to treatment by mRDT results (i.e., to prescribe an ACT or other antimalarial to mRDT-negative patients). Recruiting from both groups helped highlight enabling factors and barriers to mRDT use and treatment according to mRDT results as described in study aim 1. In addition, the outlet mRDT adherence or non-adherence was further validated from the observations made from the Mystery Client survey. This provided a basis for comparing attitudes of providers currently using mRDTs with those not currently using mRDTs.

Recruitment of adult patients and caregivers was limited to those seeking care at a private outlets with symptoms of uncomplicated malaria. Adult patients and caregivers of child patients admitted or referred to another facility with severe febrile illness were excluded. To be interviewed, patients had to be over the age of 18 years and not pregnant. Caregivers had to be presenting at the facility with a child between the ages of 2 and 5 who was sick with fever but did not exhibit any signs or symptoms of severe malaria or other severe febrile illness that would require emergency care or referral.

*In-Depth Interview guides*

Structured interview guides for both consumer and provider in-depth interviews were developed and shared during training of the research team. These are attached in the annexes within this report.

## 5. Data Collection and Management

No personal identifiers were placed on the transcripts. Transcripts were sent to be placed in a secure data base that can be accessed by the Study Coordinator and the Principal Investigators for coding and analysis using qualitative data analysis software. All transcripts were entered into appropriate data analysis software for coding and analysis.

Transcription and review of transcripts took place within one week of the interviews. Recordings were stored in locked file cabinets for the duration of the transcription and the study; only the study coordinator had access to the files. Interviewers used digital recorders for data collection. Recording will be destroyed after analysis of the IDIs is complete and the final report is submitted.

## 6. Analysis

For the analysis of the IDIs codes were developed and transcripts coded. Comprehensive listings of all coded quotations for every code were generated and the coded quotations stratified by provider type and outlet. The coding process involved a core group of 1-2 analysts who regularly communicated and discussed their use of the codes and application of the codes during the coding process.

# 7. Results

The study was able to reach a total of 40 respondents, including 24 outlet personnel and 16 adult patients and caregivers. All providers interviewed had received some form of training by PSkenya, and had between 2 and 23 years' work experience. A total of 11 clinicians, 4 lab technologists/technicians, 5 pharmacists and 4 nurses were interviewed.

**Table 2: Table showing respondents reached during this survey**

| Participant Group | Target Sample (N) | Achieved Sample |
|---|---|---|
| Outlet owners, clinicians, lab technicians, and pharmacy staff | 24 | 24 |
| Adult Patients and Caregivers | 12 | 16 |
| **Total** | **36** | **40** |

The key outcomes from the coding of the in-depth interviews are described below, with specific examples given to illustrate each theme.

## 9.1 Introduction to MRDT

All providers in the sample were aware of the MRDT, and had heard about it from PS Kenya. About a third also stated they heard about MRDT from TV advertisements and on billboards. Most providers (90%) reported that they started using RDTs as soon as they received training and had gained the confidence to use the procedure.

> *"Yes, we go for training we went to Kilifi another one we had here at Milele beach.*
> *Moderator: Okay.*
> *Respondent: I even have their certificate."* (Provider, Health Facility, mRDT compliant, Mombasa County)

> *"The first time I heard about it was through media through radio, and also the newsletter which they were providing, and also from the facilitators also we get from them. Then also from the PSI staffs also they were providing us with MRDT. So that is where we came to know about it."* (Provider, Health Facility, mRDT non-compliant, Mombasa County)

## 9.1 Malaria test quality and reliability

Most providers felt that MRDTs were over 90% accurate and that there were no reported false positives – where positive MRDT result had turned out to be negative in a microscopy test. When asked whether there were such cases, most providers were adamant that no such cases occurred, as illustrated in the provider quote below:

> *"It doesn't happen. Because that can easily happen in microscopy because it depends with the accuracy of the person who is interpreting but with MRDT it doesn't happen."* (Provider, Health Facility, mRDT-compliant, Mombasa County)

However, there were a few reported examples of patients testing negative for malaria using RDT, and positive with microscopy. According to the providers, this may happen because a patient may have previously taken anti-malarial medicine, have a different malaria strain, or have undetectable parasites.

> *"Yes that happens when people are treating malaria with prophylaxis."* (Provider, Health Facility, mRDT non-compliant, Kilifi County)

> *"We have had one or two cases, but they are very rare where we have had it negative but when we did microscopy it came out positive, and you can see that this is actually malaria." (*Provider, Health Facility, mRDT compliant, Mombasa County)

> *"I have received one case. We suspected the patient had malaria, so we went for re-test, it turned positive."* (Provider, Health Facility, mRDT non- compliant, Mombasa County)

## 9.1 Provider experiences of using mRDT

Most providers reported that the use of RDT was beneficial to them since they started using it, in several ways. These benefits are outlined below with supporting quotes for each:

### 7..1. Increased number of clients

> *"But if the MRDT is there we can do seven test at the same time so you find that in MRDT we have seven clients with malaria you test this and this and tell them to be watching their results because you have taught them how to interpret. But sometimes they like to interpret for the clients. So you find that one also it is faster because you can do seven clients at the same time*" (Provider, Health Facilit, mRDT compliant, Mombasa County)

> *"Yeah, we are seeing more clients now days. Some of them come ... they know, you know when a patients knows that whatever services that you give is quality one, they will come."* (Provider, Health Facility, mRDT non-compliant, Mombasa County)

### 7..2. Conducting out-of-office testing and treatment

*"I can only say is that you can receive communication over the phone because we are family doctors, then I will take an MRDT in my bag then I go there to confirm. I treat the client from his point of order if its malaria and if it is not malaria I can refer the patient back to the facility to confirm if it is not malaria using microscopy."* (Provider, Health Facility, mRDT compliant, Mombasa County)

### 7..3. Reduction in workload / operation cost

"*One is personnel it is easier for example I can send 20 clients per minute to the lab and my technician will just be comfortable doing the RDT tests, but if it happens that MRDT is out of stock and am sending clients for BS at the end of the day she will tell me today I was overworked. So you find that also the work personnel also enjoy."* (Provider, Health Facility, mRDT compliant, Kwale County)

*"You know the private is like ehh you are doing business.But MRDT is cheaper.So if you compare to ... it will cut down some of your cost in terms of buying those other things so there is a profit in terms of using it.Because the personnel, even if you need two people you will employ one."* (Provider, Health Facility, mRDT non-compliant, Mombasa County)

### 7..4. Patient preference and satisfaction in being able to observe the process

*"They [patients] like it because they witness the test and interpret the results for themselves, it's not like in the past where you were given written results which you don't understand or the doctor doesn't tell you what you are suffering from".* (Provider, Health Facility, mRDT compliant, Kwale County)

*"They [patients] love it because its quick, they don't spend a lot of time waiting for the results and because they can also participate in the testing process and see the results for themselves".* (Provider, Health Facility, mRDT compliant, Kwale County)

## 9.1 Patient experiences with MRDT

Overall, patients/consumers reported being happy with the RDT for a number of reasons: it represented improvement in the quality of care in terms of "rapid" results, the belief that it provided objective assessment of Malaria in terms of both accurate diagnosis and treatment and led to favourable clinical outcomes, patient ability to personally see and interpret the results of tests conducted.

### 7..1. Rapid and accurate results

*"I like it for two things first I trust it because its results are certain second is the time, It makes you not to spend a lot of time when you go to get tested, I believe the results because I believe the device and I believe the doctor."* (Consumer, Health Facility, mRDT compliant, Kwale County)

*"It is fast and It saves time, I found it easy, you know coz I know most people just place it there you see for yourself the results, it is that fast."* (Consumer, Health Facility, mRDT compliant, Kilifi County)

### 7..2. Simple and easy test

*"The test is a simple test and it is not painful and you are not made to wait the whole day it's just a few minutes then you know the results".* (Consumer, Health Facility, mRDT non- compliant, Kwale County)

**Commented [NN2]:** Interesting, they did not experience the blunt lancet

*"I like it for two things first I trust it because its results are certain second is the time, It makes you not to spend a lot of time when you go to get tested, I believe the results because I believe the device and I believe the doctor"* (Consumer, Health Facility, mRDT compliant, Kwale County)

### 7..3. Ability to read the results

The clients at the outlets were quite happy that they could read the results of the tests on their own, giving them confidence in the outcome of the tests and the subsequent management of the illness.

*"There is something like this you are given you look for yourself he tells you if it is like this it is negative this is positive so to me he said it is negative".* (Consumer, Health Facility, mRDT non- compliant, Kwale County)

### 7..4. Preference for getting treatment after confirmed tests conducted for malaria.

*"It is better you are tested first because you cannot know which fever you have you can assume it is a normal flu where as it is malaria."* (Consumer, Health Facility, mRDT compliant, Kwale County)

*"Because I have never had a fever like I had yesterday night and I have never felt my bodybeing weak the way I felt. I would like to be tested first." I only prefer that the child gets tested before receiving medical treatment. Because sometimes the child might have high body temperature and when we go for testing we might find there is no malaria. Like there was a time my eldest daughter had a fever and went for a test at a private hospital then the result was negative. Like there is a place I went to, that is Maweni dispensary where I took my child and I explained to the provider and after the explanation the provider wrote for me the prescription for malaria medicine. I was told to buy the medicine then I asked the provider how can I go to buy malaria drugs and am not sure that the child has malaria infection?* (Consumer, Pharmacy, mRDT compliant, Kwale County)

## 9.1 Provider concerns and challenges with mRDT

**Commented [NN3]:** Are there similar concerns for the consumers?

There were a number of concerns that were specifically raised by providers which are included the poor quality of the lancets included in the kits, insufficient buffer and invalid test results that were sometimes noted. These are elaborated upon below.

### 7..1. Blunt lancets:

Nearly three quarters of providers stated that the lancets (which are usually packed in the MRDT kit) used to prick fingers, are painful. This was mainly attributed to the material used, which causes bluntness to the lancets.

> *"Respondent: The pricker is having a problem sometimes you prick then I don't know whether it doesn't go in.*
> *Moderator: That is the lancet.*
> *Respondent: Yes the lancet it is very difficult."*
> (Provider, Health Facility, mRDT compliant, Mombasa County)

> *"But the problem is with the prickers that they normally put there. They don't prick, those lancets. When you prick they bend, so you cannot harvest the blood that you need, because it will just give a very small prick and then it will bend so that pricker the lancet it is not effective." (Provider, Health Facility, mRDT non-compliant, Mombasa County)*

### 7..2. Insufficient buffer:

Another concern raised by the providers was that the kits did not have enough buffer solution to conduct the test, as noted in the quotation below:

> *"I would tell them those buffers the one that they put a single pack that has everything to increase their buffers and at least to make the lancets sharp."* (Provider, Health Facility, mRDT compliant, Kwale County)

### 7..3. Invalid results:

There were reportedly rare cases of invalid results - from about 5% of providers – and they typically repeated the tests to determine exactly whether or not patients had malaria:

> *"Yeah. There is some period the kits didn't have the control line, all of them were plain. Like two cases. So we had to repeat another one. The result was negative but It is rare very rare."*(Provider Health Facility, mRDT non- compliant, Mombasa County)

> *"Yes it is there even if you go to the record book there where they test you will see they have sometimes written invalid…so it means it is results that are not true…maybe you either repeat because there it shows there has been a mistake".* (Provider, Health Facility, mRDT compliant, Kilifi County)

# 8. Factors influencing adoption of mRDT

## 9.1 Sources and brands of RDTs

All the respondents said that they only get their RDTs from one supplier, PS Kenya. However, they also mentioned that one can also buy RDTs from other retailers such as chemists or black market but they were not sure where the retailers got their RDT supply from.

**Commented [NN4]:** What about factors influencing adoption for consumers?

**Commented [NN5]:** Providers, Since respondentrs refer to bothe providers and consumers we need to specify which respondents

**Commented [NN6]:** And by Black market they mean what source exactly, one of the challenges we have had in the leakage from the public sector.

*"Because we were trained and knew we buy from you from PSKenya these other ones they buy from the chemist so it is when I started asking myself "those MRDTs that are in the chemists are they the same as these ones for PSKenya?"* (Provider, Health Facility, mRDT non-compliant, Mombasa County))

*"Us here we rely on PS Kenya but there is this retailer, there was a time we ordered from PSI and there were some delays, so we had another guy that helped us for that time. He told us that he also got them from somewhere and assured us that they were in good condition. In terms of packaging the buffers we saw they were different because we have that packaging for the small buffer you see but for this one it is at the lid. So we saw just slight difference. We questioned him and he said he also gets from PS Kenya."* (Provider, Health Facility, mRDT non-compliant, Kwale County)

Preference for PS Kenya as a supplier is reportedly based on trust for quality and the feeling that other suppliers can bring them fake products.

*"…And then they deliver on time you call today you want those kits they organize and they are ferried by tomorrow morning you report here you find Fargo Courier services are already here with the kits yes".* (Provider, Health Facility, mRDT compliant, Mombasa County)

*"You know these things, you will use the thing that you are used to having you know, it is like at home when you say you will be relying on let us say ushindi soap that is what you will go for every time. So for these test we have fear you can go for other MRDT rather than these ones from PS Kenya and they fail you."* (Provider, Health Facility, mRDT non-compliant, Mombasa County)

### 9.1 Purchase price for RDT and costs to end-users

Many providers were non-committal about a reasonable cost for the kits. The providers mentioned that the price should be made affordable to them so that they do not charge the clients too much. However, they did not give a figure as to what was affordable to them. They noted that the maximum price would be determined by their locality as a provider and how much people/ consumer, can afford to pay.` Some suggested that they should be given the RDTs for free.

*"It should be as cheap as ten shillings. So that I can test at 50/-. Like the microscopy, microscopy is going at 50 shillings it has been that way for a long time."* (Provider, Pharmacy, RDT non-compliant, Mombasa County)

### 9.1 Quality of MRDT supplies

Generally, providers were satisfied with the quality of supplies received. In particular, they were pleased with the quality of instructions on the MRDT kit

*"There are drawings, that show you where you put your buffer and where you put your blood sample but many people mix the blood sample with the buffer, So it just depends with the provider."* (Provider, Health Facility, mRDT compliant, Mombasa County)

*"The instructions are very clear I don't think we have problems with the instructions."* (Provider, Health Facility, mRDT non-compliant, Mombasa County)

Most providers were also happy with the buffer, the swab, and the blood collection device.

*"We encourage dry swap you only give us a spirit swab. So we don't expect to use the spirit swab also at the same time to arrest bleeding you know the spirit irritates, when you put spirit at the place where you have been injured it will be irritating so most of the time we find that we have our swab, we use your spirit swab to swab the place then we prick and then we get the sample but when you are now holding it when you are healing it now we give the client our dry swab we won't give the client spirit swab because spirit will irritate. And when it irritates the client tomorrow the client will not do malaria test*." (Provider, Health Facility, mRDT compliant, Mombasa County)

## 9. Opportunities for improvement

The providers interviewed during this study were generally happy with the project and the mRDT as a diagnostic tool for malaria. However, they did have suggestions for enhancement which included having the kit show the levels of malaria parasite and the improving on the blunt lancets that are included in the kit.

### 9.1 Kit to show parasitemia levels

*"I would have told them to advance that kit so that it shows the level of parasites in the body that because our clients want to know the level of infection that is in their body".* (Provider, Health Facility, mRDT compliant, Mombasa County)

*"They produce a kit which can test at least even two or three common malaria parasites to improve on the pricker the way I told you"* (Provider, Health Facility, mRDT compliant, Mombasa County)

### 9.2 Quality of the lancet

*"They improve on the prickers."* (Provider, Health Facilty, mRDT compliant, Mombasa County)

*"That lancet, that lancet is the one you should change…that lancet is so painful such that if you inject even you yourself sometimes you are afraid to inject deeper..they complain it has forced us to even take for HIV to inject them with it that one does tap. So that lancet if it will be changed also it will be good".* (Provider, Health Facility, mRDT compliant, Kilifi County)

# 10. Summary of key findings

## 10.1. Facilitators to provider use of mRDT

According to the providers interviewed for this qualitative study, the key factors that influence the use of a malaria rapid diagnostic test and treatment according to test results at participating private sector outlets in selected areas in Kilifi, Mombasa and Kwale Counties were identified as follows:

- Ease of use of the kit
- Reliability of the test
- Reduction in work load
- Patient preference

## 10.2. Reduction of barriers to provider use of mRDT

There were no barriers noted by the providers interviewed in this study to the use of a malaria rapid diagnostic test and treatment according to test results at private health facilities in selected areas in Kilifi, Mombasa and Kwale Counties. However, the barriers that were noted had to do with the mRDT test kit itself and could be reduced by improving on the following:

**Commented [NN7]:**

**Commented [NN8R7]:** You mentioned price, can we reword this from no barriers to limited barriers?

- Having sharper lancets
- Increasing the amount of buffer (especially for the individual kit)

## 10.3. Factors influencing adoption of mRDT

The key factors that influence the adoption of malaria rapid diagnostic tests at private health facilities in selected areas of Kilifi, Mombasa and Kwale Counties, according to the providers interviewed in this study were:

- Reliability of the supplies
- Training on mRDT use (by PS Kenya)
- Cost of the mRDT

# 11. Limitations

As with most qualitative interviews the knowledge produced through the in-depth interviews might not be generalizeable to other people or other settings (i.e., findings might be unique to the relatively few people included in the research study). However we anticipate that the data from these qualitative interviews will provide understanding and description of participants' personal experiences of mRDT use (i.e., the emic or insider's viewpoint) that can be useful in informing the design of the program.

## ANNEXES

## Annex 1: Consumer Consent Form

**STUDY INFORMATION**

*READ TO THE CLIENT:*

You are eligible for the study. I would now like to ask some questions about the type of service you came here for, and your experiences and feelings about the visit. I would also like to ask some basic background questions about your age, home, and education.

Umehitimu kushiriki katika utafiti. Sasa ningependa kuuliza maswali kuhusu huduma uliokujia hapa leo, hisia zako na maoni kuhusu huduma. Ningependa kuuliza maswali yakimsingi kuhusiana na umri wako, nyumbani kwako and masomo.

The interview will take about 30-45 minutes to complete. All of the answers you give will be completely confidential and will not be shared with anyone at this place. I am not evaluating the outlet/facility, nor will the information you give me be given to anyone outside of the study team. This interview is not a test. There are no right or wrong answers to the questions I am going to ask you. We do not collect any information that identifies you.

Mazungumzo yetu yatachukua kama dakika 30-45. Majibu yako yote yatawekwa kwa usiri na hayatapewa mtu yeyote kutoka eneo hili. Sitathmini hiki kituo, napia ujumbe wote utakao nipa hautapewa yeyote nje ya timu ya utafiti. Maswali si mtihani. Hakuna majibu sahihi wala yasiosahihi kwa maswali nitakao kuuliza. Hatutachukua taarifa ambayo inaweza kutambulisha.

Participating in the survey is optional, and will not have any impact on the care you receive in the future. Additionally, if I ask you any question you don't want to answer, we can skip to the next question, or we can stop the interview at any time. Your views are very important, so we do hope that you respond to as many questions as possible. If you have any questions, you can contact the people listed on this information sheet.

Kushiriki kwa utafiti ni kwa hiari yako, na hakutaadhiri kwa vyovyote huduma utakayopokea. Pia Iwapo nitakuuliza swali ambalo hutaki kujibu, tunaweza kuruka swali hilo au kutamatisha mazungumzo yetu kwa wakati wowote. Maoni yako ni ya muhimu, kwa hivyo ni matumaini yetu kuwa utajibu maswali mengi iwezekanavyo. Ukiwa na maswali, unaweza kuwasiliana na watu walio orodheshwa kwa fomu ya habari.

In case you want additional information about this study, get in touch with Ms. Rhoune Ochako of Population Services Kenya, P.O BOX 22591-00400 Nairobi; Telephone: +254 20 271 4346/2714354/271 4355.

Iwapo unahitaji maelezo zaidi kuhusu utafiti huu,unaweza wasilaina na Bi. Rhoune Ochako wa Population Services Kenya, SLP 22591-00400 Nairobi; Simu: +254 20 271 4346/2714354/271 4355.

Any complain about the way you have been treated during this study should be addressed to the Secretary, AMREF ESRC,

Nairobi, Kenya; E-mail:esrc.kenya@amref.org

Iwapo una malalamishi yoyote kuhusu jambo lolote umetendewa wakati wa utafiti huu unaweza wasiliana na Katibu mkuu wa Bodi ya uadhiri ya kimaadili, AMREF ESRC, Nairobi, Kenya; E-mail: esrc.kenya@amref.org

**INFORMED CONSENT**

*To be completed by the interviewer after reading the study information and answering any questions from the participant.*

Does the respondent agree to participate in the study?

Je, mjojiwa amekubali kushiriki?

1 = Yes Ndio

0 = No La

***Thank the respondent for their time. End interview.***

**Interviewer's signature :** _____

**Witness Signature:_____**

## Annex 2: Provider Consent Form

**STUDY INFORMATION**

*READ TO THE CLIENT:*

You have been randomly selected to participate in this study as a provider. I would like to ask some questions about the services you provide to patients who come here presenting with fever, your participation in the MRDT programme, quality of services and your opinions on how the programme can be improved.

*Umechaguliwa bila ya kupendelewa, kama mhudumu wa afya kuhusika kweye huu utafikti .* Ningependa kuuuliza maswali kuhusu huduma unazotoa kwa mgonjwa mwenye homa., kuhusika kwako kwenye MRDT, ubora wa huduma, na maoni yako jinis ya kuboresha zaidi huduma hii ya MRDT.

The interview will take about one and half to complete. All of the answers you give will be completely confidential and will not be shared with anyone at this place. I am not evaluating the outlet/facility, nor will the information you give me be given to anyone outside of the study team. This interview is not a test. There are no right or wrong answers to the questions I am going to ask you.

Mazungumzo yetu yatachukua kama saa moja na nusu. Majibu yako yote yatawekwa kwa usiri na hayatapewa mtu yeyote kutoka eneo hili. Sitathmini hiki kituo, napia ujumbe wote utakao nipa hautapewa yeyote nje ya timu ya utafiti. Maswali si mtihani. Hakuna majibu sahihi wala yasiosahihi kwa maswali nitakao kuuliza.

Participating in the survey is optional. Additionally, if I ask you any question you don't want to answer, we can skip to the next question, or we can stop the interview at any time. Your views are very important, so we do hope that you respond to as many questions as possible. If you have any questions, you can contact the people listed on this information sheet.

Kushiriki kwa utafiti ni kwa hiari yako. Pia Iwapo nitakuuliza swali ambalo hutaki kujibu, tunaweza kuruka swali hilo au kutamatisha mazungumzo yetu kwa wakati wowote. Maoni yako ni ya muhimu, kwa hivyo ni matumaini yetu kuwa utajibu maswali mengi iwezekanavyo. Ukiwa na maswali, unaweza kuwasiliana na watu walio orodheshwa kwa fomu ya habari.

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Iwapo una malalamishi yoyote kuhusu jambo lolote umetendewa wakati wa utafiti huu unaweza wasiliana na Katibu mkuu wa Bodi ya uadhiri ya kimaadili, AMREF ESRC, Nairobi, Kenya; E-mail: esrc.kenya@amref.org

**Interviewer Signature**:_____

**Witness signature:_____**

## Annex 3: Consumer Interview Guide

1. I'd like to start out by asking about your visit here today. Could you tell me about what happened? *Ningependa kuanza kwa kuuliza kuhusu ziara yako hapa leo. Unaweza kuniambia kuhusu kile kilichotokea?*
    - Who did you see?
      *Je ulionekana na nani*
    - What did they do?
      *Je walifanya nini*
    - How did they determine the cause of your/your child's fever*? Ni vipi walidhibitisha sababu ya homa yako/ya mwanao*
    - What medicines or other treatments did they prescribe?
      *Ni dawa au matibabu mengine gani walikuandikia?*

*If the interviewee does NOT mention diagnostic tests, ask the following question. Otherwise skip to question ##.*

2. Did _____ [the person you saw] do any kind of test to determine the cause of your/your child's fever? Did you accept? What made you decide to accept/not accept the test*?*

   *Je _____ [mtu uliye muona] alifanya aina yoyote ya pimo kudhibitisha sababu ya homa yako / mtoto wako? Je, ulikubali? Nini kilikufanya kukubali / kutokubali pimo?*

*If yes, go on to the next question. If no, skip to question ##.*

3. Could you tell me about the test or tests? *Je, unaweza kuniambia kuhusu pimo au vipimo*?
    - What kind of test was it? *Je kilikuwa kipimo cha aina gani?*
    - What did it look like? What did _____ [the person you saw] do*? Je kilifanana vipi? Je, _____ [mtu uliye muona]alifanya nini?*
    - How long did it take? *Je ilichukua muda gani?*
    - What was the result? *Je nini ilikuwa matokeo?*

    → *Probe to determine if the test was an RDT, microscopy, or something else.*

4. What did _____ [the person you saw] tell you about the test? *Nini _____[mtu uliye muona] alikuambia kuhusu pimo?*
    - What questions did you ask about it? *Je ni maswali gani uliuliza kuihusu?*
    - What concerns did you have about it? *Je ulikuwa na hofu zipi kuihusu?*

5. What did you think about the test? *Ni nini mawazo yako kuhusu pimo?*
    - Was it a good test? What about the test made it good (or not good)?*Je kipimo kilikuwa kizuri? Nini kuhusu kipimo kilikifanya cha Kupendeza? (au kisicho cha kupendeza)?*

- Are you confident that the test gave the right result? What makes you confident or not confident? *Je unaimani kuwa kipimo kilitoa matokeo sahihi? Nini kinacho kupa imani au kutoamini?*

6. When you/your child has a fever, would you prefer getting a test before getting treatment, or would you prefer getting treatment right away, without a test? What is the reason for your preference? *Wakati wewe / mtoto wako ana homa, unaweza pendelea kupata pimo kabla ya kupata matibabu, au ungependelea kupata matibabu mara moja, bila ya kupimwa? Sababu ya upendeleo wako nini?*

    1. *Are there some situations where you would prefer a test first and some where you would rather receive treatment right away? Could you please explain: Which situations? . Je, kuna baadhi ya hali ambapo ungependelea kupimwa kwanza na baadhi ambapo heri kupata matibabu mara moja? Je, unaweza tafadhali kueleza hali hizi?*
    2. *Are there some situations where you would prefer one kind of test and other situations where you would prefer a different kind? Could you please explain: What kind of test would you prefer in what circumstances? Je, kuna baadhi ya hali ambapo ungependelea aina moja ya pimo na hali nyingine ambapo ungependelea aina tofauti? Je, unaweza tafadhali kueleza: Ni aina gani ya pimo unapendelea katika mazingira gani?*

7. If you could go to a _____ [type of provider] who does a test before treatment or a different _____ [type of provider] who gives treatment without a test, which would you choose? What would make you choose to _____? *Kama unaweza kwenda kwa _____ [aina ya mtoa huduma] ambaye ana pima kabla ya matibabu au tofauti _____ [aina ya mtoa huduma] anayetoa matibabu bila kupima, ni yupi ungemchagua?Kitu gani kitakufanya kuchagua _____?*
    - What would you say to a _____ [type of provider] who wanted to give treatment without a test? *Nini unaweza kusema kwa _____ [aina ya mtoa huduma] ambaye alitaka kutoa matibabu bila pimo?*
    - What would you say to a _____ [type of provider] who would only give treatment after a test? *Nini unaweza kusema kwa _____ [aina ya mtoa huduma] ambaye hutoa matibabu baada ya pimo tu?*

8. How much did you pay for _____ [type of test] today? *Je ulilipa kiasi gani kwa ajili ya _____ [aina ya pimo] leo?*
    - Was that a reasonable price? *Je kiasi ulicho lipa kilifaa?*

    3. *If the participant says she did not purchase the test, ask if she would have been willing to purchase a cheaper test? If so, ask: How much would you have been willing to pay today?*

        *kama ingekubidikulipia,je ungekuwa tayari kulipa kiasi gani cha fedha leo?*

9. What else would you like me to know? *Ninini kingine ungependa mimi nijue*

10. What questions would you like to ask me? *Ni maswali gani ungependa kuniuliza?*

## Annex 4: Provider Interview Guide

*Note: This guide is designed to be used with all providers involved in patient care of any kind. However, some questions will apply only to facility owners or those responsible for procurement.*

**1. Introduction**

- I'd like to start by asking you about your involvement in the PS Kenya/MOH private sector mRDT project, when did you join? Have you been trained**?**
- Are you still part of the project**?**

**2. Fever management and diagnosis**

9. Please help me understand what happens when a patient arrives here with a fever. If I had a fever, or I brought my child here with a fever, what would happen?
    - What are all the other steps that would happen from the time I arrived until the time I left?
10. How do you assess for fever?
11. Do you have materials that help you on the assessments? Is there anything you would want improved on the materials?

*Ask the follow-up questions below <u>if the participant does not mention them spontaneously</u>:*

- Would you be the first person I see? If so, what would you do? Are you the only person I would see, or would I see someone else after I see you? What would that person do?
- If you are not the first person I would see, who would I see before you? What would they do? After I saw them, how would I get to you? What would you do? What would I do after I saw you?
- What questions would you ask me? What kinds of exams or tests would you (or someone else) do?
- How would you decide what treatment I should take? Would I get the treatment here [at this facility]? If so, would I get it from you or from someone else? Who and where? If not, where would you send me?

*If the facility is participating in the mRDT project, ask any of the following questions <u>that the interviewee has not already answered</u>:*

12. What different tests or exams do you have for patients with fever? How do you decide when to use each test? (*Ask one-by-one: If the interviewee says the facility has test X and test Y, ask how he/she decides when to use X and when to use Y. What makes test X the right test in some situations and test Y the right test in other situations? For instance, if the interviewee says the facility has RDTs and microscopy, ask: How do you decide when to use an RDT and when to use microscopy? What makes microscopy the right test in some situations and an RDT is the right*

*test in other situations?*) Do you ever use *both* an RDT and microscopy for the same patient? Under what circumstances would you do that? [*probe for more information:* "would you use one before the other?" *etc.*]

Now I would like to ask you more about your experience with using malaria rapid diagnostic tests.

13. How did you first hear about RDTs?

14. What did you think about RDTs when you first heard about them?

15. What made you decide to try using them?

    - Did you decide to try them as soon as you heard about them or did you think about it for a while first? What issues did you think about before deciding to try them?
    - What made you interested in using them? What benefits did you expect from using them?
    - What doubts or concerns did you have about using them? What problems did you foresee?

**3. Test quality and reliability**

16. From what you've just told me *[summarize what interviewee has said]* what is your assessment of RDTs now, compared to when you were first deciding whether to use them?

    - What has been different than you expected? What has been the same as or similar to what you expected?
    - What benefits do you see now? What problems have you experienced? What concerns do you have?
    - What have your customers/clients/patients said about the test? What do they like? What do they not like? What questions have they asked you? What concerns do they have?

17. In your experience, how accurate is the test?

    - Have you ever had a situation in which a patient tested positive, but did not have malaria? What happened? What did he/she have? What did you do? What treatment did you give?
    - Have you ever had a situation in which a patient tested negative, but did have malaria? What happened? What did he/she have? What did you do? What treatment did you give?
    - Have you ever had a situation in which a patient tested negative, but you *suspected* that they had malaria anyway? What happened? What did he/she have? What did you do? What treatment did you give?
    - Have you ever had a situation where microscopy and the RDT gave different results? What happened? What did you do? What treatment did you give?

18. Do you see more positive or more negative tests? Do you ever see tests where you can't determine whether the patient is positive or negative? Can you describe what happened in those cases? How often have you seen them?

19. In your experience, what do patients think about the test?
    - What do they think about being tested (or being tested with something else other than by microscopy)?
    - What do they say about paying for the test?
    - Do some patients ask you to sell to them antimalarials without doing the test first? What reasons do they give?
    - Do some patients choose not to buy antimalarials even if the test is positive? What reasons do they give?
    - Do some patients want antimalarials even when the test is negative? What reasons do they give?

20. What has been your experience with the quality of the supplies that come with the test?
    - What about the instructions?
    - What about the blood collection device – how easy or hard is it to use?
    - What about the alcohol swab?
    - What about the lancet?

    - What about the buffer – is there too little? The right amount?
    - What about expiry date–have you received an expired kit? What did you do?
    - What about routine quality control of mRDTs/who ensures routine quality control is maintained/what steps are taken to take steps to ensure quality of mRDTs is maintained?

21. *Where, how and when do you dispose of your waste? Are there challenges with waste disposal? If yes, What remedies would you give for challenges mentioned?*

22. If you had a chance to talk with the manufacturer of the test, what would you want to tell them? What improvements would you suggest? What would you keep the same as it is now?

23. *Ps Kenya has had ongoing support supervision, how has this been? Are there areas for improvement? Which are these areas?*

**4. Market for RDTs/Factors affecting choice of RDTs**

*[Note: Some of the following questions will only apply to owners or those responsible for purchasing supplies. If your interviewee is a lab technician or someone not involved in procurement, skip questions that are not relevant to him/her.]*

24. Now I would like to ask you more about the RDTs available on the market here in [*name of town*]. If I had a clinic in [*name of town*] and I wanted to buy RDTs, where could I go?

    - First of all, what are the different sources or suppliers of RDTs here? [*Probe for different types of wholesalers or vendors – wholesale pharmacies, manufacturers' representatives, retailers, etc. – Try to get a complete list of suppliers ("Who are all the*

*suppliers…?"). If that is not possible, try to get an idea of whether there are many suppliers or just a few.*

- [*If there is only 1 supplier, skip to the next bullet point. If there are multiple suppliers, probe*:] Are some suppliers more expensive or cheaper than others? Which are more expensive? Which are cheaper?
- Where do you buy the RDTs you use here? What made you choose that supplier/those suppliers? [*If there are multiple providers in town:*] What makes them better than the others?

25. How many different brands of RDTs are available to providers here? If I wanted to buy RDTs for a clinic, what brand or brands could I buy?

*Try to get a complete list. If the interviewee mentions only 1 brand, probe:* "You mentioned [*brand name*]. What other brands are available here?" *If the interviewee mentions more than 1, probe:* "You mentioned A, B, and C. What other brands are available?" *If the interviewee mentions some additional brands, probe a second time:* "OK, you mentioned A, B, C, and D. Besides those four, are there any others?"

*If there is more than 1 brand or type available, ask the following questions otherwise, skip to q. 15:*

- You mentioned that [*name of test 1, name of test 2, etc*.] are available to providers in [*name of town*]. How similar or different are they from one another? Are some of a better quality than others? In what ways are they better/worse? It what other ways are they different?
- Are some tests more expensive or cheaper than others? What is the range in prices? Which test is most expensive? Which test is cheapest?
- Where would you go to get each one? Are they all available in the same places or do you have to go to different places for different tests?
- What brand or brands have you used? [*As before, probe for additional brands: "*You mentioned that you have used [*name of brand].* What other brands have you used? Any others?] What made you decide to use [*name of brand or brands*]? What do you like about [*name of brand?*]
- Are there any brands you would not want to use? Why?
- Are certain brands better in one situation and other brands in a different situation? [*If so, ask for an explanation.*]
- Are certain brands available more consistently than others? Which ones?

26. You said you were using [*brand name of test*]. What made you decide to use [*brand name*]?

27. How much was price a factor in choosing [*name of test provider is using now*]?

28. What's the maximum amount you would be willing to pay for an RDT? How do you decide the maximum amount you would be willing to pay?

29. What do you charge for an RDT now? How did you decide on that price? [*If the provider also offers microscopy*]: What do you charge for microscopy? How did you decide on that price?

30. Tests are currently sold in boxes of 25 for the hospital pack and 20 for the single pack. Which have you been buying? Which do you prefer and why? Is buying that box (mentioned) convenient for you or would you prefer to a smaller or larger quantity? How long does it take you to use a full box?

31. What other factors influenced your decision about what RDT to use? [*Probe for additional factors:* "You mentioned A, B, and C. What other factors influenced your decision?"]

32. What factors will you consider when you decide *whether* to buy (more) RDTs in the future? [*For questions 19 and 20, ask about availability and reliability of supply if the participant does not mention them.*]

33. What factors will you consider when you decide *which* RDT to buy in the future?

34. Do you have instances of RDT stock outs? What do you do in such scenarios?

## 5. RDTs and profitability

35. How has having RDTs available affected your income? Have your profits increased or decreased or stayed the same?

36. Since you started using RDTs, are you seeing more clients or fewer clients? [*If the provider says s/he has new clients:*] Where are your new clients coming from? Were they seeing a different provider before they came to you? What made them decide to come to you? [*If the provider says s/he has lost clients:*] Where do your former clients go now? What made them decide to go there?

How does having RDTs available affect other things your clients buy from you? Do they buy more or less or the same amount as before? What do they buy that is similar or different? Do they spend more money or less money or about the same amount?

PS Kenya has recently been running a promotion, do you know about this ? what is it about? how have you benefitted?

## 6. Treatment

To finish, I'd just like to ask you a few questions about treatment.

37. When a patient tests positive for malaria using an RDT, what treatment do you give or recommend?

38. When a patient tests negative for malaria using an RDT, what treatment do you give or recommend?

39. What if the RDT result is different than the microscopy result?

40. Are there ever situations when you refer a patient somewhere else without testing them first? [*If so*], What are those situations – under what circumstances would you refer without testing? Where do you refer them? Is there an MOU between you and that facility?