Formative research Mozambique:

Technology Arm

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inSCALE – Innovations at Scale for Community Access and Lasting Effects

The inSCALE programme, a collaboration between Malaria Consortium, London School of Hygiene and Tropical Medicine (LSHTM) and University College of London (UCL), aims to increase coverage of integrated community case management (ICCM) of children with diarrhea, pneumonia and malaria in Uganda and Mozambique. inSCALE is funded by Bill & Melinda Gates Foundation and sets out to better understand community based agent (CBA) motivation and attrition, and to find feasible and acceptable solutions to CBA retention and performance which are vital for successful implementation of ICCM at scale.

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ACRONYMS

ACS	Agente Comunitário de Saúde/Community Based Agent
APE	Agente Polivalente Elementar
BASICS	Basic Support for Institutionalizing Child Survival project / USAID
CBA	Community Based Agent
CHW	Community Health Worker
CL	Community Leader
CUGs	Closed User Groups
DPS	Direcção Provincial de Saúde/ Provincial Health Directorate
FGD	Focus Group Discussion
HF	Health Facility
ICCM	Integrated Community Case Management
IDI	In-Depht Interview
IMP	Implementers/Decision Makers
InSCALE	Innovations at Scale for Community Access and Lasting Effects
MCHIP	Maternal Child Health Integrated Program
MOH	Ministry of Health
NED	Núcleo de Estatística Distrital/ District Department of Biostatistics
NEP	Núcleo de Estatística Provincial/ Provincial Department of Biostatistics
RDT	Rapid Diagnostic Tests
SDSMAS	Serviços Distritais de Saúde, Mulher e Acção Social/ District Health Office
SUP	Supervisor
UNICEF	United Nations Children's Fund
USAID	United States Agency for International Development
WHO	World Health Organization

EXECUTIVE SUMMARY

Introduction

Malaria, pneumonia and diarrhea are some of the most common causes of death in children under five years of age, especially in the developing world. Incidence and mortality rates of children under five years of age due to those three diseases remain disproportionately higher in poor settings due to a lack of access to facility-based services and effective prevention, diagnosing and treating strategies. Despite it has been argued that there are simple key practices of preventing deaths among children less than five years of age the figures relating child health remains poor. WHO, UNICEF and experts on child health recommend introducing the Integrated Management of Childhood Illness strategy, including increasing access to adequate diagnosing, treating and preventive child health services, introducing or upgrade the skills of existing cadres of community health workers (CHWs) in order to deliver curative interventions as well as ensuring strong links from communities to existing health facilities and developing innovative approaches to the quality delivery of child health care, as main strategies to reduce child mortality.

While major gains have been made in reducing the mortality among the children under five years of age during the last decade in most sub-Saharan countries, these improvements, however, remain under expected and indeed have not been accessible to all children, especially who live in rural areas.

In this context, the inSCALE programme, a collaboration between Malaria Consortium, London School of Hygiene and Tropical Medicine (LSHTM) and University College of London (UCL), aims to increase coverage of integrated community case management (ICCM) of children with diarrhea, pneumonia and malaria by developing and implementing innovative activities, designed to promote CHW motivation, performance and retention in 2 African countries: Mozambique and Uganda.

This overview summarizes the results of formative research regarding the perceptions and experiences of the APEs, supervisors, keys implementers of the APE program, community leaders and mothers of children under 5 years of age who received treatment from APEs in order to identify potential barriers and influencing factors related to the acceptability and feasibility of the proposed technology supported innovations in Mozambique.

Methods

The design of this formative research followed a participatory approach to the discussion of APE related work in the study communities. The formative research was conducted in Massinga District, rural area of Inhambane province, and Inhambane city, south Mozambique. Through group discussions and in-depth interviews, this formative research used a larger environmental perspective to understand several factors related to APE work, supervision and support, data submission and use, personal mobile phone experience and use for APE work as well as innovations to increase communications and improve data submission and use.

The formative research was designed to inform the development of the inSCALE intervention delivery strategy, a technology approach strategy (for outreach to APEs and supervisors), and an advocacy strategy (for outreach to policymakers). As a next step, these strategies will be implemented and evaluated through demonstration studies in Inhambane province. The findings from the demonstration studies may then serve as an evidence base for government deciding how to incorporate technology approach into comprehensive APE programme and increase the iCCM strategy coverage as well.

Key findings

Section 1: the current APE context and its implications

- Awareness, perceptions and use of APEs – mother and community leader perspectives

There is a wide awareness on the APE work as they are well known in the community and easily approachable. It was also felt that they are commonly used because they take care of the sick people and dispense drugs free of charge.

What the community currently does and what could they do?

While some community members provide thanks to APEs when they successfully treat sick people others recognized that no support is provided and that they do not consider it necessary as they perceive that the APEs are working under the responsibility of the MOH. However some participants stressed that the provision of support was beyond the means of the community due to widespread poverty. Others stated that if there was a strong sensitization for supporting the APE work the community would be organized to provide some consistent support.

Current APE activities and motivation

APE duties

The APE occupation range from diagnosing and treatment some diseases in the community mainly malaria, diarrhea and pneumonia, providing health education for disease prevention and control through house to house visits and public lectures, collect data on the patients observed/treated, fill the record book, compile a summary on the statistics as well as monthly submit such data to the health facility, collect drug at the HF and the referral of patients as well.

APE Motivation – APE, mother and community leader perspectives

It was felt that the APE motivation is related to the sense of helping fellow community members, being chosen by their communities as well as trusted, appreciated, respected and recognized as doing an important work by fellow community members, receiving vote of thanks and feeling confident and able to perform their tasks as they were trained for that.

What would make APE stop work

Nothing would make the APEs stopping work unless the existence of some influencing factors structural problem such as program closing or displacement

Main problems/challenges APEs face and things that have helped – APE, supervisor, mother and community leader perspectives

- The main challenges the APEs face while performing their tasks in the communities are related to distances/transport constraints, drug and RDT stock outs, lack of essential commodities, lack community support and difficulty to diagnose pneumonia in children due to timer faulty and malaria when there is RDT stock out.
- While the APEs use to report to their supervisors regarding the faced challenges it was felt that there is no specific mechanisms/initiatives used by the APEs to overcome such challenges.
- As for improving the APE work it was found that the APEs need more technical support through frequent supervision/contacts with their supervisors, interactive job aids, refresher training, regular availability of stock of drugs and RDTs, adequate equipments mainly timers and transportation subsidy for collecting drug in the health facilities.

APE supervision and support

Who supervises the APEs and how

- Range of APE supervisors (the Health facility based supervisor conduct a monthly supervision, the district supervisor makes a quarterly supervision and provincial supervisor and malaria consortium conduct two annually supervision (each per semester)
- Overall the APE supervision is made through face to face supervision and some contacts when the APEs go to the health facility to submit data and collect drugs; during such supervision encounters it is used to check the APE performance as well as the record book and the monthly summary form, verify the balance of the drug stock, ask for the challenges faced and provide some technical support/on-the-job-training as well.

Main duties of health facility based APE supervisors

- Conduct community supervision visits to verify the APE record books, check the monthly summary forms, verify the balance of the stock of drugs and commodities as well as the way the APEs have stored the drugs;
- Provide technical and logistic support to the APEs;
- Receive and compile the monthly statistics submitted by the APEs, and send to the district [District Health Office];
- Coordinate the APE activities in the health catchment area.

Tools and support received to help with APE supervision

Despite some irregularity it was found that overall as for supervision purposes the supervisors have been provided guides, transport, daily allowance, stationery, pens, refresher training and job aids.

Extra tools and support that would be useful according to supervisors

From supervisor perspectives it would be useful for them if it was provided enough resources for effective supervision such as job aids, stationary and forms on a regular basis, reliable transport allowance, supportive supervision, refresher training and training in using the data submitted by APEs as well as writing a report on the summary of the data submitted.

Time spent on APE related work – supervisor views
Overall it was felt that the health facility based supervisors don't spend enough time as needed during community supervision visits due to transport and geographic constraints; moreover they felt that due to high workload relating to their other occupation in the health facility sometimes they don't engage effectively in the APE related work.

Supervisor motivation
The bulk of supervisors motivation are related to the sense of obligation to ensure good quality of community care delivery as health workers, helping the APEs to ensure good quality performance and have some skills to perform APE supervision.

What would make supervisors stop doing their work?
Overall many supervisors stated that nothing would make them stopping work. However few stressed that some structural challenges such as the recurrent lack of resources for effective supervision mainly relating to lack of transport, job aids and other essential resources to carry out effective supervision would negatively influence their motivation.

Main challenges with supervision
The geographic and transport constraints for conducting effective supervision visits, inadequate amount of time allocated to supervision duties, poor drug re-supply when the APEs face drug stock outs, lack of essential commodities such as forms, stationery, pens and register books, lack of refresher training and job aids were cited as the main challenges the supervisors face.

Suggestions for improving the current APE supervision
It was felt that to led to a greater level of quality supervision it would be of crucial importance to provide regular supervision/ for better tracking and supporting the APE work, increase the frequency of contacts between the APE and their supervisors, having enough time for community supervision visits, providing enough stationery, job aids and refresher training for the supervisors, having clear supervisors job description as well as effective coordination of the supervisor tasks in the health facility in order to be provided more support to the APE work.

Supportive people and interactions between APEs and supervisors and other APEs
- The main supportive people for the APEs are the health facility based supervisors; the other people who play a key role in supporting the APE work are the community leaders who use to help them in mobilising community members to attend the lectures and community meetings chaired by the APEs; it was also felt that to a certain level the APEs ask for some support from district supervisor and health facility based pharmacist as well.
- Overall it was felt that there is lack of interaction between APE and their supervisors and between fellow APEs.
- Both the APEs and their supervisors recognized that there is a need to improve their interactions in order to be more frequent, consistent, takes more duration, include much more preventive related issues and carried out on a regular basis as well.

APE Data Submission

- The APEs have been submitting monthly data in a paper based format; the submitted data is the monthly summary of the number of cases diagnosed, treated and referred by the APEs to the health facility, total number of the house to house visits, lectures held and balance of medicines.
- It was found that all the APEs like to submit data as it has been seen as a way of verification that they are really working in the communities.
- However it was felt that the barriers relating to geographic and transport to reach the health facility and lack of community supervision act as recurrent challenges and indeed important sources of APE dissatisfaction and poor data quality.

Key Implications for the proposed innovations

APE work

- ✓ It was felt that the communities value, appreciate, respect and use the APEs as they are aware of the crucial importance of their work. Thus innovation design should address the existing good relationship between APEs and communities to reinforce the APE recognition and strengthen the community support as well.
- ✓ As the APEs are strongly committed to their community and motivated by contributing to a healthier community the innovation design should highlight their selection by community as for strengthen the community involvement and support as well.
- ✓ There are some APEs challenges which won't be solved through the proposed innovation mainly the drugs and RDTs stock outs as well as transportation constraints for collecting drugs in the health facilities. While the provided phone can be used to improve communications about drug supply and management inSCALE should previously inform and sensitize the APEs about the scope of the intervention as for deterrent some expectations as well as promote the delivery of drugs by the health facility supervisors during monthly community supervisions.

APE Supervision

- ✓ The main problems with supervision are relating to the regularity and completeness of the community supervision visits as well as limited time for effective engagement of the supervisors on the APE related work; while conducting supervision via phone and targeted supervision based on submitted data may improve the APE supervision inSCALE need to be aware of constraints to supervision that cannot be addressed by the proposed innovation such as lack of transport and supervisor workload at health facility.
- ✓ As the supervisors value the quality of community health care delivery and even the APEs themselves value performance focused supervision this should be addressed by inSCALE as a core component of the innovation; as for addressing such issue the provided phones may be required to assist supervisors in improving their support and performance through uploaded job aids/refreshment training.

APE Data Submission

- ✓ Despite it was felt that all the APEs like to submit data, it was found that there is some challenges relating to transport barriers and lack of supervision which consequently

influence the timely data submission and data quality as well; it was also found that both APEs and supervisors are not sure of what is currently done with submitted data, evidencing that such data are not been used effectively and obviously that there is no feedback provided to the APEs; in this context, inSCALE should consider this as an opportunity to promote the usefulness and use of the submitted data as for improving the APE performance and motivation as well as the supervisor understanding of the impact of the program. However, the APEs and supervisors accepted the idea of electronic data submission using phone, especially because it was felt as important to reduce transport challenges, ensure the timely data submission and data quality as well as provide performance feedback based on submitted data, which evidences the acceptability and expected benefit of the proposed innovation.

Section 2: Current phone use and preferred phone characteristics

Personal mobile phone experience, use for APE work/activities and preferred phone characteristics

Use of personal mobile phone for APE activities

The phones are commonly known and used by both APEs and supervisors for personal communications. It was also found that they use their own phones for communicating about APE related activities. While some APEs pointed that usually they use local languages to communicate with relatives and fellow APEs most of the APEs revealed that the main language used to communicate with supervisors is Portuguese.

Availability of mobile phone and functions used

While few APE participants mentioned that they used to switch off their mobile phones for power saving purposes especially at night most of the APEs and all the supervisor respondents revealed that their phones are always with them and switched on 24 hours a day and seven days a week. However, some respondents stated that sometimes their phones can be found off due to poor network coverage;

According to the APE and supervisor respondents they usually use the common phone functions such as calling or receiving calls, writing and receiving SMS and retrieving phone contacts.

Access to Charging, Repair and Airtime

The APE participants stressed that they use to charge their phones either in their own home, relatives or neighbor's homes with solar chargers or using car batteries free of charge. Most supervisors charged their phones from the health facilities or their homes using solar chargers or car batteries.

It was found that when phones required repair both the APEs and supervisors in generally take their phones to a local and nearby informal technician for repair; overall when there is a serious problem with the phone, they took their phones to the district headquarter where it is possible to find better phone repairing services.

Regarding airtime acquisition both the APEs and their supervisors revealed that despite some constraints related to availability the airtime has been got from small retail shops or dealers in their communities or nearby. Overall they got airtime at a personal cost when it is possible. Both the APEs and their supervisors stated that while they are using their personal phones for APE related activities the government never gave them airtime for this purpose.

Desired Phone Characteristics

It was felt that both APE and supervisor participants prefer the Nokia brand phones because are commonly used and indeed user friendly; it was also found that phones with dark colors, colored larger display screen, light but not too small phone size, long battery life and dual sim cards, were the most desired phone features.

Problems/challenges by using mobile phones

Overall, all the participants said they don't face any difficulty while using their mobile phones because the typical used functions are simple and user friendly.

Network operators used and why

Overall there was no significant difference regarding the network operators used between the While more participants revealed that are using Vodacom because of quality signal than Mcel it was found that overall both network operators have coverage limitations.

Preferences based on phone examples

Overall as both phones were from Nokia brand all of them were commonly viewed positively by the respondents. The common cited reasons were the acceptability and experience with the functioning, good battery life and the easiness for repairing purposes.

However almost all the participants preferred more the Nokia C3 than Nokia 2700 because it has bigger screen display and hold a memory card and dual sim cards as well.

Potential problems for using supplied phones

Regarding potential problems using the supplied phones it was found that the main concerns were related to operating issues as such preferred Nokia C3 was felt as modern and indeed difficult to handle use it without previous training, mobile network coverage limitations, short battery life as it was felt that typically modern phones wastes much more battery power, qualification of the phone repairers as well as parts replacement in case of a fault, possibility or not to call other people not related to their work especially family, relatives and friends.

Potential identification of supplied phones

All participants agreed and suggested that supplied phones should be branded in order to prevent from theft or recovery if lost. It was also mentioned that the phone identification should increase the APE status in the community

Key Implications regarding phone use

- ✓ Despite the phone won't be a new tool as it is commonly used by APEs and their supervisors even for some APE related activities it was felt that the proposed phone supply and closed user group intervention meets a need and indeed will enable a function that has already been identified as valuable.
- ✓ Although APEs are familiar with phones they will need training or clear instructions on using new functions. inSCALE also needs to consider that all program communications are to take place in Portuguese.
- ✓ Decisions on network choice are critical as network problems are a common constraint to phone use. The intervention team should base decisions on their network coverage survey and consider the use of a dual sim enabled phone.
- ✓ Phones are charged from car batteries, solar chargers and at the health facility and some APEs need to travel in order to charge their phone. Almost all the APEs haven't their own solar charger. Very few that have solar chargers use them to charge their phones at home. Supplying solar chargers is therefore recommended.
- ✓ The intervention design team needs to consider repair issues for example by having a central system or place for phone repair/maintenance in Massinga. Some APEs were concerned that they would have to pay for repairs or lost/stolen phones and the intervention team need to make these policies clear
- ✓ Participants desired Nokia brand phones due to familiarity and perceived ease of repair. Although there were some concerns relating the perceived fragility of the slide function and the battery life, the Nokia C3 was the preferred model of those shown to participants due to perceived usability, modern look which would increase APE status and enabling good network coverage as well. There was no a specific preference related to phone features but overall it was felt that dark colors, large color screens and long battery life were the most desirable phone features. However, there were some concerns relating to some functions mainly dual sim, camera and torch as it was felt as potentially negative on the battery power saving.
- ✓ It was also stressed that a phone with a memory card and cameras/videos could be useful for both APEs and supervisors as it could enable them to record tasks that can be reviewed and discussed at a later date (for example during supervision visits or APE meetings).
- ✓ Participants commonly suggested that the supplied phones should be branded (externally and internally) as for increasing community recognition and APEs status and also prevent phone theft.

Section 3: Innovations to increase communications: APE, supervisor and implementer perspectives

Impact on interactions between APE and supervisors and fellow APEs and perceived benefits of having free phones

All APE, supervisor and implementer respondents thought that providing phones for APE related work would be a good idea saying that everyone wants to increase the communications in order to ensure good quality community health care delivery. Several APEs participants

revealed that they have been facing some technical challenges about how to better assess, classify, and treat some illnesses under iCCM and that those difficulties would be overcome or reduced by establishing contacts with supervisors at any time using provided phones.

Although improved APE performance was universally stated as the main reason the technology supported approach would be beneficial, another benefit of this proposed intervention was that it would improve the APE supervision (the community supervision has been irregular due to lack of transport, geographic constraints and supervisor workload at the health facility) by increasing the contacts with supervisors mainly in periods between two successive community supervision which actually have been long.

Feedback on specific communication activities and their usefulness, motivational properties and challenges

Overall all participants felt that the proposed activities under technology supported approach would improve technical skills as well as make APEs feel more supported by the supervisors, increase supervision frequency, highlight the value of exchanging experiences, improve support regarding the management of drug stock as well as motivational on APEs work.

There were however some concerns relating to the potential challenges such as difficulties to discuss some complex tasks over the phone, timing of support especially in the context of emergencies, supervisors workload, perception of reduced face to face supervision as non desired and scope and moderation of communication among fellow APEs in order to prevent miscommunication.

Feedback on closed user groups

All APE, supervisor and implementer respondents were enthusiastic as this intervention was felt as useful as for ensuring enough time for further in depth discussions over the phone and indeed beneficial for access to timely support and input from supervisors, fellow APEs and peer support as well. It was also anticipated that this intervention would save the APE and supervisor money as actually they have supporting the costs of calling each other.

The most frequently mentioned potential problem with using closed user group was related to poor mobile network coverage, which was anticipated as a limitation for not being able to call one another when needed. Frequently it was suggested that inSCALE should use more than one network provider in order to overcome poor quality signal limitations.

Key implications regarding innovations to increase communications between APE and supervisors and fellow APEs

- ✓ In general it was recognised that being supplied with free phones would be of crucial importance to improve the APE performance and motivation as it was felt that there is lack of communication between APE and supervisors and between fellow APEs regarding the improvement of the APE work. However it was felt that there are some expectations regarding the use of supplied phones and the scope of communications. In

this context, inSCALE need to develop a policy or SOPs, in order to be clarified and understood the terms of use and scope of the communications as well.

- ✓ Overall there was an enthusiasm regarding the benefits of using closed user groups for APE work. Participants commonly suggested that all involved in APEs work should be included in CUGs and often family so all can benefit from the free calls to provide both professional and personal support. So inSCALE should consider both who should be included in CUGs as well as how best the intervention can be communicated to all key parties.
- ✓ As for ensuring the feasibility of CUGs intervention inSCALE should consider both the network coverage and quality signal of the available providers.

Section 4: innovations related to data submission and use

Most useful kind of response to submitted data

Overall it was felt that all APE participants appreciate and value personalized responses combined with a vote of thanks; it was also stressed that this intervention would be a type of recognition and motivation for the APE. Besides the APE respondents expressed their desire to receive feedback relating to suggestions on data quality.

Electronic data submission and response to APEs

All respondents recognized that electronic data submission would be beneficial as it was thought as for overcoming challenges related to timeliness and quality of monthly data submission. It was clearly felt that due to geographic and financial constraints, electronic data submission is more desired as it would allow the APEs to save time and money as well.
However it was commonly stressed that as for ensuring the quality and timeliness of reporting the feedback on the submitted data should be timely and constructive as well.

Data would like access to – implementers and supervisors?

All the supervisor and implementer participants agreed that they should have access to all data indicators as it would enable them to have a whole picture of the APE work in order to be aware and informed regarding the performance of the APEs as well as being able to use the data for effective planning and coordination purposes.

Feedback on specific data submission activities and their usefulness, motivational properties and challenges

Overall this intervention was felt as useful as it would positively influence the APE motivation, commitment and effort to perform the submission task as well as deliver good quality data. It was stressed that to be effective the feedback should be timely, personalized, constructive and relevant to the APE's context as well.
It was frequently stressed that automatic responses not related to what was submitted and non timely response would be de-motivating for APEs.
Issues relating network coverage limitations, policy regarding responsiveness to ensure timely and constructive feedback as well as ensuring messages are tailored to context and

personalised thank you messages which ideally include each APE's name were felt as keys for effective implementation of this intervention.

Feedback on monthly motivational text messages

It was found that all APE participants desired to receive motivational text messages with vote of thanks from influential people from the health system and community. However it was stressed that the influential person should be indeed known as role model to the APEs in order to prevent disinterest. For many APEs such motivational text messages should be formal and politely phrased in order to be felt as a serious and respectful intervention.

Key Implications regarding data submission and use and monthly motivational text messages

- ✓ All the APE respondents felt that constructive feedback and personalised messages with encouraging and vote of thanks regarding submitted data would be useful and motivational. However it was cautioned that inSCALE should consider the tone in which the feedback is communicated, timely and responsiveness of response and feedback constructiveness as key issues for ensuring the effectiveness of this specific intervention.
- ✓ Considering some concerns raised regarding both technical capacity of users and the capacity of the phones to transfer sufficient data volume in a user friendly manner, inSCALE should create a user friendly system, train users regarding effective use and handling of such technology and ensure with closer colaborattion of MOH the transmition of sufficiently detailed information to be useful.
- ✓ All APEs paticipants acknowledged that receiving messages from influential people with encouraging content and vote of thanks, emphasising the importance and value of their work in communities would be motivational. For effective intervention however it was recommended that the role model people should be well known figures and respected by APEs. It was frequently mentioned influential people from the health system. As for effectiveness of such intervention, inSCALE need to consider the views of the APE about whom they value as role model people and pre-test the proposed messages as well.

INTRODUCTION

Every year, over 10 million children under five years of age die worldwide. Most of those deaths are due to a small number of causes. Malaria, pneumonia and diarrhea are some of the most common causes of death in children under five years of age, especially in the developing world, mostly in Sub-Saharan Africa and South Asia (Black, Morris, and Bryce 2003; WHO/Unicef 2005). Incidence and mortality rates of children under five due to those cited diseases remain disproportionately higher in poor countries due to a lack of accessible and effective prevention, diagnosing and treating strategies.

Sub-Saharan countries such as Mozambique have experienced some improvements in public health and medical progress throughout much of the two last decades, leading to some gains in children surviving. These improvements, however, have not been accessible to all the children most at risk, especially who live in rural areas. Remarkable disparities in morbidity, mortality, child health care and child surviving persist between urban and rural areas meaning that "yet efforts to protect the children most at risk have not kept pace with global goals" (CORE Group, Save the Children, BASICS and MCHIP, 2010).

WHO, UNICEF and child health experts recommend introducing a strategy known as Integrated Management of Childhood Illness, including increasing access to adequate diagnosing, treating and preventive child health services, providing support for child health service delivery, including drug availability, effective supervision, referral services, and health information systems, increasing the diversity of the health care workforce, especially the involvement of community health workers (CHWs) and developing innovative approaches to the quality delivery of child health care, as strategies to reduce child mortality (WHO/Unicef 2005; CORE Group, Save the Children, BASICS and MCHIP, 2010). Achieving universal coverage with these interventions would likely prevent 60 percent of child deaths (Jones et al 2003).

Innovative strategies such as Integrated Community Case Management therefore represent a potentially life-saving intervention for millions of children under five years of age. Efforts are required to prepare health systems and communities to accept and embrace any innovation with potential to improve the child health care delivery.

The broad inSCALE project goal is to develop and implement innovative activities, grounded in theoretical and empirical evidence, designed to promote CHW motivation, performance and retention and thereby demonstrate that government led iCCM programs in 2 African countries can be rapidly driven to scale with quality, leading to a sustained increase in the proportion of sick children receiving appropriate treatment.

Through extensive review of the literature and in-country program experience multiple innovations in one 'arm' is proposed in Mozambique:

Technology supported approach: promoting APE learning and support using ICT

Aim: To achieve the principles of good supervision without frequent face to face contact we aim to utilise available technology and develop tools and applications for mobile phones and low-cost laptops which can be used for self learning; as job aides; for data submission and feedback; and for problem solving and peer-support.

The innovations being explored in the current round of formative research as well as the feasibility and acceptability of the mobile phones and chargers supplied to support them are:

a. Providing a phone to call and / or send messages between APEs and health facility supervisor.

This activity would provide low cost mobile phones and set up closed user-groups with phone operators whereby APEs can make free phone calls and send text messages to alert about problems, APEs seeking advice, APE alerting about incoming referrals and supervisor providing feedback on referrals.

This innovation will work by providing simple phones and setting up a system which enables APEs to have a direct communication with their supervisors. It may also enable communication between APEs.

b. Using low cost mobile phones for APEs to send data and receive automated feedback on performance.

- APEs to submit routine data via mobile phones instead of paper based reporting.
- Feed back to APEs how they each are performing through a variety of methods.

c. Sending APEs monthly messages designed to motivate them.

On provided mobile phones APEs will be sent a variety of SMS on a monthly basis that are designed to motivate them to perform well as APEs.

FORMATIVE RESEARCH OBJECTIVES

The main objective of this study is to explore the perceptions and experiences of the APEs, supervisors, keys implementers of the APE program, community leaders and mothers of children under 5 years of age who received treatment from APEs in order to identify potential barriers and influencing factors related to the acceptability and feasibility of the proposed technology supported innovations.

Specifically, this formative research aims to:

A. Understand the opportunities for the proposed innovations to meet existing needs by exploring the context of APEs work, current activities and motivation, supervision and support, data use and feedback, and current phone use and experience
B. Understand the structure the proposed innovations would need to adopt to be acceptable and feasible by exploring perspectives on the proposed innovations
C. Provide information on key areas flagged as important for the innovation design

Using this information, the inSCALE team aims to develop the proposed innovations in the most effective way to fulfil the aims of the project.

METHODS

Recruitment and training of fieldworkers and piloting of topic guides

Four fieldworkers were recruited and trained for one week on the background to the research, the topic guides, the 'fair notes' data collection approach, the principle of informed consent and the participant consent process required to comply with ethics as well as the three weeks data collection schedule. During the training, they were also involved in discussing and adjusting the tools to the Mozambican context. Training of the fieldworkers was carried out in Maputo.

After one week of training fieldworkers under inSCALE team supervision, conducted a two day pilot of the APE and community leader's interview and focus group discussion (FGD) guides in Boane district, Maputo province. On the third day there the supervisor and implementers interview guides were piloted in Boane district and Matola city. Fieldworkers wrote up interview and FGD field notes and then the field supervisors amended the guides according to feedback on the quality of data collection by the fieldworkers.

Field workers completed final notes as soon as possible following interviews and FGDs using the 'fair notes' approach. This approach involves fieldworkers describing what the respondents have said and illustrating the main points with direct quotations. The approach allows the field supervisor to provide fieldworkers with immediate feedback on their interview/FGD and to become more attuned to the aims and requirements of the study. The idea is that each interview or FGD is written up into 'fair notes' before the next interview or FGD is conducted. This way the fieldworker immerses themselves in the information provided and produces an in depth transcript which accurately reflects what was communicated. A further key advantage over verbatim transcription is that once fieldwork has been completed the data set is also complete.

Study design and data collection

Qualitative research was conducted regarding an in depth exploration and understanding of all the issues around the development of the proposed innovations. Qualitative research allows for a full and detailed identification of issues relating to experience and context as well.

In depth interviews (IDIs) and FGDs focused on reactions to and perspectives of proposed innovations and were respectively applied to APEs, supervisors, community leaders and implementers and mothers of children below five. Both addressed issues and opinions around current phone use, hypothetical phones to be used in the APE work and specific activities supported by these phones.

The data collection process was conducted in Massinga District and Inhambane City and consisted of twenty six (26) in-depth interviews and four (4) focus group discussions. While most of data were gathered through IDIs, FGDs were used not only to provide an environment in which perceptions and experiences could be exchanged and spontaneously expressed but also to further understand the APE work context through the views of beneficiaries.

Twenty six (26) in-depth interviews in total were conducted with APEs (12), supervisors (6), community leaders (4) and implementers (2) in Massinga district and implementers (2) in Inhambane City. Four (4) focus group discussions were conducted with mothers in Massinga district.

In Massinga District the APEs were recruited as study participants depending on their degree of access to the health facility, mobile network coverage and supervision challenges relating to transportation and geography.

All the supervisors were included in the study (because there is only five supervisors in Massinga district); the main reason for recruiting supervisors is related to their crucial importance as beneficiaries of the proposed intervention, closer work relationship with APEs as well as their current experiences, successes and challenges with skills, supervision and motivation.

The implementers who participated in the study were recruited as key informants in order to understand the perspectives and experiences of the personnel who manage and support the APE programme and ICCM implementation at district and provincial levels. Implementers were purposively sought on the basis of occupation and availability. Participation in both in-depth interview and focus group discussions was voluntary and based on written consent.

As shown in the table 1 below, the selection of study participants ensured a range of criteria in order to produce the richest data set possible.

Table 1: Sample size and inclusion criteria of participants

Sample	Inclusion criteria	Objectives
12 in depth interviews (IDIs) with APEs	12 APEs in Massinga district who have been operational post training for 12 months. Comprises 3 APEs who collect supplies and submit data from the main health facility as they have better transport, 3 APEs from an extremely isolated location, 3 who were APEs prior to the most recent training and 3 APEs who have limited/poor access to mobile network coverage.	A, B and C
5 IDIs with supervisors	All supervisors (health facility supervisors) in Massinga who have been operational post APEs training 12 months ago	A, B and C
4 IDIs with community leaders	Community secretaries (linked to govt). Strata based on level of involvement. Two categories: 'involved' and 'not so involved' with determination of which participant falls into which category taken based on advice from district supervisor. 2	A, B and C

	participants in each strata	
3 IDIs with District personnel	District supervisor, district health medical chief and district level biostatistician	A, B and C Particular focus on use of data
2 IDIs with Province level personnel	Provincial supervisor and public health representative	A, B and C Particular focus on use of data
4 FGDs with mothers of children under five	4 geographic locations with participants from a range of circumstances recruited (i.e. One child under 5/ multiple children under 5, old, young) As total from all the conducted FGDs there were 34 participants(FGD1 – 11 participants, FGD2 – 6, FGD3 – 8 and FGD4 – 9) FGDs were chosen and not IDIs because there are many mothers of children under five from different circumstances and FGDs were considered the best method of capturing the diversity of perspectives	A with a particular focus on views on APEs, supporting them and the facilitators and barriers to accessing their services.

Data collection tools

Semi-structured topic guides were developed for use in all in-depth interviews and FGDs to ensure that all the issues were effectively covered. In fact, the use of semi-structured topic guides allows the respondents themselves to dictate the flow of discussions with guidance from the moderator, rather than the questions being administered in the question/response format common in quantitative research.

Thus, five **data collection** tools (4 in-depth interview guidelines and 1 FGD) were developed (see appendixes):

- Topic guide for In-depth Interview with APEs
- Topic guide for In-depth Interview with Supervisors
- Topic guide for In-depth Interview with implementers
- Topic guide for in-depth interview with community leaders
- Topic guide for FGD with Mothers

Data Quality Assurance

The fieldwork was closely monitored and supported by the inSCALE team who led and coordinated all activities. Field supervisors technically monitored the progress through face-to-face supervision, reviewing fieldworkers 'fair notes' and feedback accordingly.

While each fieldworker reported daily to the field supervisors about the day's activities and progress, the field supervisors ensured that the work was carried out as scheduled. They also ensured that the transcripts were forwarded to the inSCALE team regularly.

Overall the data quality was assured through:

- Hiring of experienced field workers
- Training of field workers by inSCALE team
- Piloting the study tools
- Ensuring compliance of the method designed for the study
- Regular reviewing of 'fair notes' and feedback accordingly
- By conducting preliminary analysis workshops with fieldworkers in the field on two occasions during the data collection where issues around the quality of the data were discussed and preliminary results identified
- Technical support provided by UCL through visits on two separate occasions: during initial research design and during the second week of data collection.

Data Analysis

All the IDIs and FGDs, with the consent of the participants, were audio taped and the fieldworkers took notes. With their notes and audio recordings the fieldworkers created 'fair notes' in Portuguese. Fair notes are descriptions of what participants have said which use direct quotes to illustrate and validate the descriptions.

Data sorting and analysis were carried out using classic method (no specific software was used). Overall, a three-stage data-analysis process was conducted. In the first analysis stage, all fair notes from each group discussion and interviews were read and reduced to 4 – 7 pages of synopsis and were then translated into English. In this data reduction or condensation phase key thematic areas were identified and coded using both inductive and deductive methods. The recurrent information was classified using the categories that had been anticipated in the study design as well as new ones that emerged during content analysis.

The second analysis stage consisted of transferring the compiled data into matrices or display tables. This allowed the identification of regularities and patterns that emerged across the participants. The recurrent themes were then transferred into the final matrices.

In the third phase, key findings were drawn based on analysis verification of the recurrent themes, regularities, patterns, and causal flows observed.

As the intrinsic nature of qualitative research is not to provide numbers as quantitative research does, but to provide insights and depth about the issues explored, the results included in this report do not represent frequencies of responses but recurrent themes, perceptions, beliefs and experiences among participants. In this context, the results represent insights into the underlying perceptions and experiences regarding APE performance, motivation and supervision, as well as contextual challenges as perceived by participants and their response to proposed innovations and the use of low cost technologies.

KEY FINDINGS AND DISCUSSION

Section 1: the current context and its implications

Summary of key findings
Mother and community leader perspectives on the APE activities and challenges **Awareness and use of APEs** The APEs are well known in their communities, trusted, respected and commonly used. This use is influenced by whether they are accessible physically and at any time, they have been treating the common childhood diseases in the community such as malaria, pneumonia and diarrhea, have dispensed essential drugs for free and follow up with patients. **What the community currently does and what could they do?** The community provides thanks to APEs when successfully treated and occasionally (when they go to their homes regarding house to house visits) they provide some food and drink. However it was acknowledged by some respondents that overall there is lack of community support to the APE work. Meanwhile many participants mentioned that the community members don't provide effective support as they are aware that the APEs are working under the government responsibility. Some felt the provision of support was beyond the means of the community due to the widespread poverty. Besides it was suggested that if provided and intervention regarding effective community sensitization the community members would support the APE work. **Current APE activities and motivation – APE perspective** **APE duties** Overall the APEs duties are related to diagnosis and treatment of some diseases especially malaria, pneumonia and diarrhea in children, house to house visits, patients' referral, health education on control and preventive issues and data collection, compiling and submission. **APE Motivation** The sense of helping their communities, feeling confident and able to perform their tasks as they

received a specific training as well as being chosen by their communities to help them, it was commonly cited as motivational by the APE respondents; it was also mentioned that other motivational properties are related to vote of thanks as well as being trusted, appreciated, respected and recognized as doing an important work by the community members.

What would make the APE stopping work

All the APE participants stated that nothing would make them stopping work.

Problems APEs face and how their work could be improved – APE perspective

The bulk of APE problems were mentioned as relating to distances/transport constraints, difficulty for diagnosing pneumonia in children due to timer faulty and malaria when there is RDT stock out, drug and RDT stock outs, lack of essential commodities and lack community support.

As for improving the APE work it was found that the APEs need more technical support thorough frequent supervision/contacts with their supervisors, job aids, refresher training, drugs, essential tools and equipments to work effectively subsidy of transportation for drug collecting purposes.

Main problems APEs face – Supervisor perspectives

From the supervisor perspectives the problems APE face are mainly related to:

- Geographic and transport which has been challenging for traveling to and from the health facility for data submission and drug collection;
- Drug and RDT stock outs;
- Challenges relating to pneumonia diagnosis due to the timers being faulty as well as malaria diagnosis when there are no RDTs available.

Problems APEs face and how their work could be improved - mother and community leader perspectives

From the perspective of mothers and community leader participants, the main problems facing APE are related to transport, movement around the community, and the lack of drugs and commodities such as RDTs and gloves and other equipment required for their job.

It was also suggested by mother and community leader participants that it would be of crucial importance to provide APEs with subsidy of transportation, drugs, commodities and tools they require to work effectively as well as increasing community participation and involvement in the APE work through sensitisation.

APE supervision and support

Who supervises APEs and how?

According to the MOH norm the APE is directly supervised by the health facility supervisor (in Massinga district there is 6 HF supervisors), on a monthly basis through community visits. However it was found that since January some APEs don't receive community supervision due to geographic and transport barriers. Meanwhile the HF supervisor use to make some contacts with the APEs when monthly they go to the HF for submitting data and collecting drugs;

Besides the HF supervision the district supervisor used to make quarterly community supervision to the APEs to ensure that the APE work is on track. However, it also has been irregular because of transport and geographic barriers.

The provincial supervisor/coordinator with Malaria consortium makes two supervision visits per year per each district where it is chosen some APEs for community visit supervision.

In general the APE supervision is made through face to face supervision and some contacts when the APEs go to the health facility to submit data and collect drugs.

Main duties of health facility based supervisors

- Receive and compile the monthly statistics submitted by the APEs, and then send to the district [district health office];
- Conduct supervision visits/face to face supervision with APEs to verify the record books, check the data summary forms, balance of the stock of drugs and commodities as well as the way the APEs have stored the drugs;
- Provide technical and logistic support to the APE;
- Coordinate all the APE activities in the health area;

Tools and support received to help with APE supervision

Supervisors cited that in general to help with APE supervision they receive forms, stationary, transport and daily allowance.

Extra tools and support that would be useful according to supervisors

From supervisor perspectives it would be useful for them if it was provided enough resources for effective supervision such as job aids, stationary and forms on a regular basis, reliable transport allowance, supportive supervision, refresher training and training in using the data submitted by APEs as well as writing a report on the summary of the data submitted.

Time spent on APE related work – supervisor views

Overall it was felt that time spent during the supervision isn't enough due to constraints related to transport and the distance required to travel across the communities to reach all the APEs. Some supervisors cited that it has been difficult to give enough attention to the APE supervision even when the APEs go to the health facility to submit data due to other occupations in the health facility as well as workload that sometimes they face.

Supervisor motivation

The supervisors are mainly motivated to work because:

- They like to help the APEs and ensure quality performance; as health workers is their responsibility to ensure and deliver good quality health care;
- They were trained for this and feel confident to effectively conduct APE supervision as they have skills.

What would make supervisors stop doing their work?

Nothing would make them sopping work unless in the context that the recurrent challenges such as lack of resources and transport for effective supervision could lead to a point that was impossible to conduct any activity.

Main challenges with supervision

According to the supervisors the main challenges they face in their work were:

- Lack of resources and transport;
- inadequate amount of time allocated to supervision duties
- Lack of forms, registers, pens,

- Difficulty in using data submitted as well as writing good report on the data submitted

Suggestions to improve supervision

There were numerous suggestions made by APE, supervisor and implementer participants that were considered likely to improve supervision. The main ones were: increasing the frequency of contacts between supervisors and APEs through face-to-face supervision as it was seen as irregular and providing phone to improve contacts between supervisors and APEs), having regular availability means of transport, fuel and enough time for supervision visits, providing enough stationery, job aids and refresher training for the supervisors as well, having clear supervisors job description and effective plan of supervisor tasks in the health facility.

Supportive people and interactions between APEs-supervisors and other APEs

The supportive people for the APEs are mostly their supervisors and often the community leaders. While both the APEs and supervisors revealed that they like to interact each other, overall they recognized that it hasn't been conducted on a regular basis; it was also felt that such contacts aren't enough and indeed to be useful it is needed to be more frequent, takes more duration and include much more preventive related issues.

APE Data Submission

The APEs have been submitting data in a paper based format on a monthly basis; these data are related to the summary of total number of cases diagnosed, treated and referred by the APEs to the health facility, total number of the house to house visits, lectures held and balance of medicines. While all the APE like to submit data as it serves as a way of verification that they are doing something of crucial importance it was found that the challenge related to the transportation constraints faced for reaching the health facility acts as important source of APE dissatisfaction.

1.1 Perceptions of APE work and use – mother and community leader perspectives

1.1.1 Community awareness and use of APEs

All the mothers who participated in focus group discussions (FGDs) reported that they know the APEs, are aware of the importance of their work in the community and they have visited them to receive the services they provide.

> *"We know very well the APEs and we're aware of the importance of the activities they provide in our community... They do the work of the hospital [provide health care] and when people get sick they treat them".* (Mother participant from FGD 1, Licunha).

Overall it was cited that the APEs are of crucial importance to prevent diseases, treat patients, patient's referral as well as dispense drugs for free. Regarding the main reasons for using the APEs, some mothers stressed that when their children get sick they seek for the services provided by the APEs because they feel that the APEs treat them well, are well known and trusted in the community, can be relied on for their expertise, are accessible (as they are community-based, which means that it is not necessary to travel for long distances for reaching a health facility), are available at any time (even at night, weekend and public holidays, they

have been observed and treated by the APEs) and although with some flaws, the APEs have the medicines needed to treat especially the major childhood diseases in the community.

> *"I take my children to the APE because they are based in the our community, take care of the sick persons with care and affection, and even when children get sick at night they help us"* (Mother participant from FGD 2, Balata).

> *"The APEs take very well care of us and when a person gets sick they accept to receive us into their homes even on Sundays, which is very good as we avoid traveling for long distances for reaching a health facility".* (Mother participant from FGD 4, Manhenje).

> *"They were trained to take care of us and our children therefore when my child gets sick I use to visit the APE to assess the disease and give medicines... but sometimes he hasn't had some drugs to treat malaria in children...".* (Mother participant from FGD 3, Liondzuane).

Table 2: Main reasons for using APEs – mother perspective

Overall it was cited that the APEs are commonly used in the community because: - They are well known, trusted, approachable and friendly with patients; - They are community based and indeed accessible compared to the health facilities; - They dispense essential drugs to treat several diseases such as malaria, pneumonia and diarrhea; - They dispense drugs for free; - They are engage in health promotion activities and raise awareness of health risk factors in the community as well; - They make patient referral and follow up home visits to check on sick people.

With respect to the role of the APEs in the community, both the mothers and community leaders who participated in this study stated that the APEs have been treating children, providing counseling, health education on the promotion and disease control and prevention, through sensitization and lectures, house to house visits, patients referral to the health facility and follow-up patients after treatment.

> *"Besides of treating children, the APEs provide counseling and health education on disease prevention and make house to house visits".* (Mother participant from FGD 2, Balata).

> *"In our community the APE have been conducting several activities such as health education trough house to house visits, organizing lectures and awareness on the prevention of diseases in the community, giving medicines to treat diseases and referring patients to the health facility."* (Participant 4: 61 years old male, CL).

> "*I know what the APEs do in our community, even me I was treated by him when I once got ill. He just came to my house and gave me some medicines for free and advised me*

to go the health facility if in within three days I didn't get better" (Participant 2: 66 years old male, CL).

1.1.2 What the community currently does and what they could do?

Overall it was felt that community members provide vote thanks to APEs when they have successfully treated a sick person and occasional give some food or drink when they visit them regarding house to house visit.

> *"When the sick children get well after being treated by APE we use to thanks them for their useful work".* (Mother participant from FGD 4, Manhenje).

According to the mothers and the community leaders who participated in the study, some community members do not feel that they have obligation i.e. they have been showing some resistance to support the APE work as they perceive that APEs are working under the government responsibility. Some felt the provision of support was beyond the means of the community due to widespread poverty.

> *"Most people in the community said that government is that should help the APEs because they are under his responsibility... but also I feel that the poverty does not allow us to provide an effective support to the APE work*". (Mother participant from FGD 3, Liondzuane).

Besides it was felt that if the need for APE support was well explained, the community would provide more support because the potential for community support of APEs is there.

> *"I think that if the community members were effectively sensitized they would provide more assistance to the APE work… for example they would give some money to cover the travel costs to the health centre for drug collecting*". (Participant 4: 61 years old male, CL).

1.2 Current APE activities and motivation

Summary of key findings
APE Duties - Diagnose diseases and treat sick children; - Follow-up of patients; - Conduct house to house visits; - Advice pregnant mothers to go to the health facility for antenatal consultation and sensitize them to bring their children when they get sick; - Referral of patients to the health facility. **APE work schedule** - While it is stated by the MOH that an APE should work from half past seven to half past 15, per day, and from Monday to Friday, overall it was found that the APEs used to work beyond such statement; they have been taking care of people before or after such stated period as they work even at night, weekend and public holiday. **APE workload** - For all the APE participants it was felt that their workload is enough as they can balance their APE related work with personal occupations and familiar/social life.

1.2.1 APE duties

The APEs interviewed confirmed that they have been performing many tasks in the community. According to them, they have been diagnosing and treating some diseases such as malaria, pneumonia, diarrhea, fevers, headaches; also they said that have been taking care of patients with cough, scabies, wounds, intestinal parasites and conjunctivitis. In addition, they stated that have conducting other activities such as house to house visits, health education and promotion, disease prevention, first aid, referral of patients with serious illnesses or who are not of their domain, follow-up of patients, completion and submission of data monthly, and collect of kit of medicines in health facility.

> *"I walk around the community from house to house making visits and when I find a sick person I assess and treat the disease but if the case is serious I refer immediately to the health facility".* (Participant 9: 20 years old male, APE).

> *"I treat sick children, follow-up of patients, advise pregnant mothers to go to the health facility for antenatal consultation and sensitize them to bring their children when they get sick".* (Participant 8: 28 years old female, APE).

> "*I give advice to people build latrines, wash hands and use mosquito nets. To perform such duties I give priority to families who have children under 5 years old... mothers have brought their children to be treated when they get sick as I treat malaria, diarrhea, pneumonia, cough, wounds, scabies and conjunctivitis*". (Participant 2: 42 years old female, APE)

With respect to the work schedule, all the APEs who participated in the study indicated that although they received a recommendation to work five days a week (From Monday to Friday), in fact, they generally have worked on Saturdays and Sundays. In relation to the duration of their work per day, overall the APE participants said that they have worked at least eight hours per day (From 8 am up to 16 hours). However, they stressed that although it is stated by the MOH, this period of 5 working days per week and 8 hours per day is not strictly followed as can be seen in the statements below:

> *"Our working days per week are from Monday to Friday. But normally I do the work of APE on Saturday and Sunday because disease does not have day and I can't see a sick person dies only because is weekend".* (Participant 6: 28 years old male, APE).

> *"Even with the stated period from half past seven to half past 15, per day as recommended by our supervisors, I have been taking care of people before or after this time and even in public holidays, because I'm here to help sick people".* (Participant 10: 23 years old female, APE).

> *"I use to work on Saturdays because the disease always happens and does not choose the day or hour... the community members have my phone number and when someone gets sick his family call to me or come to visit me at my house at any time".* (Participant 1: 33 years old male, APE).

When asked if the time they spend is enough and compatible for them to perform other tasks not related to the APE work or whether they can combine the APE work with family and social issues, almost all the APEs participants were unanimous in saying that time they have spend performing APE work is enough as it is possible to make their personal tasks before and after working as APE. However, some stated that sometimes it is difficult to balance the APE work and social life, but overall, they are still happy with this time.

> *"The working time as APE is enough because I can wake up, go to my farm and then back home to do some domestic work. After that I start working as APE... even when I come back from the work it is possible to do other things and cook to my family".* (Participant 8: 28 years old female, APE).

> *"Although sometimes it has been a little bit difficult to balance the APE work with social life, especially in the weekend, I think the period I spend per day performing APE tasks is enough as it is possible to have time to take care of my children and husband".* (Participant 5: 32 years old female, APE).

1.2.2 What would make them stop work

When asked about what would make them stop work as APE, almost all the APE respondents stressed that nothing will make them stop working as APE because they like the APE job and especially because they are aware that they are helping their communities. Some stated that

they would never stop because they had also experienced disease while for others they feel they have a commitment to their communities and worry at the impression leaving would give. Reputation locally matters.

> "*Nothing will make me stop doing this work because I like what I do".* (Participant 8: 28 years old female, APE).
> "*As Mozambican citizen I have to help the sick people because one day I was also rescued. So I'll never stop working as APE*". (Participant 11: 46 years old male, APE).
>
> *"The idea of leaving this work as APE has not yet crossed my mind ... I've accepted the work and if I leave I will be misunderstood in the community to have occupied a position that would be for someone else".* (Participant 7: 29 years old male, APE).

1.2.3 APE motivation: APE and mother and community leader perspectives

Summary of key findings
APE perspectives
- The APEs stated that they are mainly motivated to work because: - They are committed to help their communities in order to ensure good community health - They have been trained to work in the community as APE - They have been chosen by their communities to help them with disease control and prevention and diagnosis and treatment of some diseases - They have been respected by the community members as people who are doing important work in the community. -
Mothers and community leaders perspectives
The mothers and community leaders stated that APEs are motivated to work because: - It can be clearly perceived that the APEs are motivated because they take care of patients happily and confidently; - The APEs do their work because they like and are committed to their communities; - The APEs do their work because they were trained for that.

With respect to what motivates them to work as APE, all the APEs interviewed were unanimous in stating that what motivates them most is the perception that they are important in helping community members in preventing and treating diseases in their communities, have been chosen by the community members to serve them and be recognized by the community that they are doing a great work and saving lives.

> *"I do this work to help my community in health promotion and disease prevention. I like this work because despite some people still resisting I have seen that there are things that have changed especially the behavior related to personal and collective hygiene as a result of my work in the community".* (Participant 8: 28 years old female, APE).
>
> "*I'm doing this work as a free will especially because my dream was to work in health matters. Also, because I have been trained to work in the community... So I feel that I*

have skills to sensitize people for disease prevention and I can treat some sick persons in the community". (Participant 6: 28 years old male, APE).

"*I feel very well in doing my work because I have been chosen by the community members to help them, the people trust in me and recognize that I have been doing a great work in community*". (Participant 12: 38 years old male, APE).

"*The recognition I have been receiving from people who I have treated in the community is very catchy and gives me strength to continue working as APE.*" (Participant 4: 41 years old female, APE).

Meanwhile, the community leaders and mothers who participated in the study added that they perceive that the APEs are motivated by their work as they are always happy while taking care of people, are confident that they are really helping people and show commitment to their work when conducting house to house visits. According to some community leaders if they were not then they wouldn't continue doing theses visits because it is not easy due the distances.

"They are motivated because they have been smiling and talkative while observing sick people and they show that are confident with their decisions." (Participant 3: 41 years old male, CL).

"Considering the challenges they have been facing, I think they do this work because they really like it... even when they come to visit us in our home we can see that they are committed to help us." (Mother participant from FGD 3, Liondzuane).

"I see that he likes to do his job, if was not happy with it he would stop to do the house to house visits in the community because households are far from one another." (Participant 4: 61 years old male, CL).

1.2.4 APEs challenges/problems and things that have helped – APE, supervisor and mother and community leader perspectives

Summary of key findings on the APE challenges/problems
APE perspectives - The geographic constraints relating to distance, poor roads conditions and travel time to walk around their communities were commonly cited as a big challenge; - Similarly, geographic and financial constraints were cited as a recurrent problem because the combination of distance and lack of money for transportation between the communities and heath facilities for monthly data submission and medicines/commodities collection is felt to be a great challenging factor; - It was also felt that one of the major and frequent APE complaints is related to the drug and commodities stock out such as lack of RDTs, gloves and paper for recording purposes; - Some difficulties in identifying the signals and symptoms of pneumonia in children and malaria when there is no RDT were cited as a challenging factor as well. **Supervisor perspectives** - The main APE challenges perceived by supervisors are the lack of money for covering the costs of traveling to and from the health facility for data submission and drug collection; - The drug stock outs and some challenges relating to pneumonia diagnosis due to the timers being faulty as well as malaria diagnosis when there are no RDTs available were similarly cited as APE challenging factors. **Mother and community leader perspectives** - From this group participant perspectives it was possible to found that difficult to move around the community because of long distances between the households, lack of subsidy to cover transport costs, long travel time to and from the health as well as drugs and RDT stock-outs were felt as the most APE challenging factors.

1.2.4.1 APEs challenges/problems and things that have helped - APE perspectives

When asked about challenges or problems that they have been facing in their work as APEs, almost all the respondents said they have many. The main challenge is related to long distances for reaching the health facility for purposes of data submission and drugs collecting and to walk around the community during the house to house visits. These challenges ranged from not having money for transportation, not having the means of transportation and poor road conditions. Besides these challenging factors, it was also indicated some challenges related to difficulty in diagnosing some diseases, especially pneumonia, RDT and drug stock-outs, lack of essential supplies such as gloves and scissors, lack of refresher training and lack of community support.

> *"The distances between the houses are long, and although I have bicycle in many areas it is impossible to ride it because of poor road conditions".* (Participant 4: 41 years old female, APE).

> *"The lack of money for transportation and lack of means of transport for traveling to the health facility for submitting the statistics and pick up the kit of medicines are the main difficulties that I face monthly".* (Participant 10: 23 years old female, APE).

> *"When I conduct house to house visits often I find a sick children with cough or fever...unfortunately frequently I have stock outs of cough medicine [Amoxicillin] and anti-malarial; in this situation I use to refer to the facility... but the people complain that they have no money for transport because the facility is far from the community* "(Participant 5: 32 years old female, APE).

When questioned about what have helped them for overcoming the challenges and perform their tasks successfully, while some APEs stated they have used the training manual for clarifying some questions, others said that have been using their own mobile phone and money to call to their supervisors for addressing issues related to their work. Also some respondents indicated that the collaboration of some community members in hearing and implementing their recommendations have helped them to conduct successful their activities in the community, especially those related to the prevention of diarrheal diseases.

> *"The manual I've received during the training has instructions on how to treat different diseases that we have learned, especially malaria, pneumonia and diarrhea...so when I have a doubt I use to read it".* (Participant1: 33 years old male, APE).

> *"Some community members listen to my advices and the information that I provided to build latrines and take good care of personal and collective hygiene therefore it have helped our community to reduce the cases of diarrhea in the community*". (Participant 6: 28 years old male, APE).

Overall, it was found that almost all the APEs who participated in the study did not mention a specific mechanism/support that have helped them to overcome the challenges related to transportation and travel for submitting data and collecting drugs at the health facility. However, while some APE respondents stressed that have been explaining their problems related to work to their supervisors (both health facility and district supervisors) and even to their community leaders, they have not received any support to solve these challenges. Others reveled that they are resigned as they have realized that their challenges won't be solved in the short term period.

> *"I have reported the some problems I have been facing monthly but until now I never received any support to solve the presented problems".* (Participant 12: 38 years old male, APE).

> *"I've always reported to my supervisor about the problems of lack of money to pay for transportation for submitting data and collecting the medicines at the health facility but*

this concern has not yet solved..." (Participant 10: 23 years old female, APE)

"Every month I have reported to my supervisor that the TDR and cough drug [amoxicillin] usually finish early but this issue is never resolved... I think that the ministry no longer can solve this problem". (Participant 8: 28 years old female, APE).

As a consequence of the challenge related to transport, the APE respondents stressed that sometimes they have used their own money and subsidy (they have received three monthly), to cover the expenses related to travelling to and from the health facility.

"What helps me is that sometimes I use my own money and use my subsidies for covering the expenses related to transportation to the facility where I go monthly to submit the data and collect medicines". (Participant 9: 29 years old male, APE).

Considering the importance of their work in the communities the APEs stressed that the community members should be more committed in order to provide more support to their work. Seemingly community members do not feel that this is their responsibility however.

"Sometimes I have no money to get the Chapa [Collective taxi] to go to the health facility for submitting the monthly statistics, but as I know that it's important, I usually borrow money to some community members... often some community members refuse to lend me some money because they feel that haven't responsibility to help me". (Participant 4: 41 years old female, APE).

1.2.4.2. APE problems and challenges – supervisor perspectives

When asked about what they know as the main problems/challenges faced by APEs while performing their tasks in the communities, the supervisors interviewed stated that some APEs still face some difficulties diagnosing pneumonia in children and malaria when there is a RDT stock out, lack of drugs and some essential materials especially RDT, gloves and paper for data recording purposes and lack of money for covering the monthly costs related to transportation to the health facility.

"Some APEs still have some problems in identifying the signals and symptoms of pneumonia in children because the available timers don't work adequately as well as difficulties in diagnosing malaria when there is no RDT". (Participant 3: 23 years old female, SUP).

"The main problem that the APEs have faced is related to the lack of money for covering the costs of traveling to and from the health facility as always they have complaint for a transportation subsidy". (Participant 2: 39 years old female, SUP).

> *"One of the major and frequent APE complaints is related to the lack of some commodities such as RDT, gloves and paper for data recording purposes".* (Participant 1: 28 years old female, SUP).

> *"...another problem they have frequently report is the early lack of some medicines especially ant malarial and amoxicillin... unfortunately as the drugs are provided monthly some APE takes long time waiting for receiving the new kit".* (Participant 5: 25 years old female, SUP).

In relation to what the supervisors have done to help the APEs overcoming the faced problems/challenges, these group of respondents stated that when it is possible they have provided some support to the APEs during supervision visits when it is reviewed and discussed together the guidelines/algorithms on how to diagnose and treat patients with pneumonia and malaria, providing some technical support through phone when the APEs asked for, providing materials such as gloves and paper and sometimes calling using their own mobile phone and airtime for asking about the faced challenges.

> *"To overcome the problems related to pneumonia and malaria diagnosing, when I go to visit them I use to revise with them the malaria and pneumonia algorithms, and teach how to use correctly the timer".* (Participant 3: 23 years old female, SUP).

> *"One way that I use to help the APEs is to provide some materials such as gloves and paper as I know that always it is missing".* (Participant 2: 39 years old female, SUP).

> *"With respect to drugs and RDT stock outs I have explained them that it has been beyond my control and that it is very difficult to provide drugs in middle of the month... I think they understand".* (Participant 1: 28 years old female, SUP).

When asked to indicate the most difficult challenges to be solved, the supervisor participants were unanimous in stating that is the transportation constraints for submitting data and collecting drugs at the health facility.

> *"The major problem faced by APEs is the issue of transportation* for submitting data and collecting drugs at the health facility as in practice it is situated far from their community*".* (Participant 3: 23 years old female, SUP).

1.2.4.3 Problems APE face and how their work could be improved – mother and community leader perspectives

Overall it was possible to find that mothers and community leaders are aware of the problems that the APEs have been facing while performing their work in the community. From the perspective of these participants groups the main problems facing APEs as they perform their work is related to transportation to and from the health facility, distance regarding walking around the community and the lack of drugs and other essential commodities required for their job.

Regarding the transport constraints it was commonly cited that APEs are on a monthly basis facing the same problems of using their own money or having to borrow money from neighbors, friends or relatives to cover the traveling costs meaning that they were not paid transportation subsidies for collecting drugs and supplies and data submission as well.

> *"The main problem faced by the APEs in their work are lack of money and transport, because normally they travel for long distances for reaching the health centre... it takes a long travel time and wastes his precious time which could be spent in assessing or treating a disease. Also they face stock outs of some medicines and supplies such as gloves and scissors".* (Participant 1: 62 years old male, CL).

In addition it was stated that other important problems faced by APEs relate to movement as they perceive that it is difficult to walk around the community on foot to visit all the families.

> *"it takes time and indeed is tiring…".* (Participant 3: 41 years old male, CL).

> *"What complicates the job of the APEs is the fact of having to travel for long distances to make house to house visits, especially here in our community where the houses are separated by long distances. So, it takes time and frequently when he is approached by some sick people is difficult to find him...".* (Mother participant from FGD 4, Manhenge).

Other common challenges cited by some mothers were the drugs stock outs and other essential commodities such as RDTs, gloves and smock. In fact, the impact of drug stock outs was seen as challenging in terms of cost of transport and distance to the health facility as well as travel time.

> *"The APEs also face a recurrent problem of drug stock outs… when they face such problem we suffer from the consequences too because we have to look for transportation to travel to the health centre which in general is tricky due to lack of money, transport, distance and travel time as well"* (Mother participant from FGD 1, Licunha).

Table 3: Main problems APEs face - mother and community leader perspectives

- One of the key perceptions related to APEs challenges is the distances between the households as it was felt to be tiring and difficult to move around the community when making house to house visits - lack of transport and travel time to and from the health facility meaning that APEs have to spent a large amount of time travelling which could be used for assessing and treating sick children - Lack of resources mainly drugs stock-out which was seen as one of the most APE challenging factors because the community members don't like to be observed and then not be given any medicine; it was also cited challenges related to RDT stock out, lack of commodities such as gloves, stationery and smock.

Regarding those cited problems/challenges APEs face while performing their tasks in the communities it was suggested by mother and community leader participants that should be fundamental to provide transport subsidy as well as enough stock of drugs, RDTs and all the necessary commodities in order to prevent early stock out. While most of the mother and community leader participants pointed possible solutions to be solved by the MoH, some also admitted that themselves as community members should provide more support to the APE work.

> *"As for reduce the problems faced by APEs I think that the government [MOH] should give them subsidies for transport to and from the hospital [Health centre] and indeed give them enough drugs and RDTs to avoid stock outs".* (Participant 4: 61 years old male, CL).

> *"I feel that although the APEs are working under the responsibility of the government, we as beneficiaries of their work should support them more. For example, if possible, we should collect some money from the community members to cover the transport costs as for monthly drugs collecting at the health facility...".* (Mother participant from FGD 3, Liondzuane

1.2.4.4 APEs difficulties/challenges in treating malaria, diarrhea and pneumonia

When asked about the difficulties/challenges they have faced during the diagnosis and treatment of malaria, diarrhea and pneumonia, the APEs interviewed recognized that they have been facing some difficulties in diagnosing pneumonia in children and malaria. While at times this involved a lack of equipment such as RDTs it also involved challenges in establishing children's symptoms due to poor explanations and collaboration by mothers. Also it was found that the stock out of RDT and essential drugs such as anti-malarial and amoxicillin has been seen as most challenging factors.

> *"In relation to the diagnosis of pneumonia in children I have to say that I face some problems associated with the counting of heartbeat as our timers do not work properly; in addition as some mothers can't explain very well their baby symptoms for me it have*

been difficult to identify the signs of this disease in the little babies". (Participant 10: 23 years old female, APE).

"For me it has been tricky to diagnose malaria in the little babies when there is no RDTs as other signals and symptoms of fever, cough or influenza are the same in malaria patients…you know as such babies don't speak yet it has been difficult to deal with such challenge mainly when their mothers don't collaborate properly…". (Participant 7: 29 years old male, APE).

"... For example, now I use RDT for malaria diagnosis, then I have to refer the patient to the health facility because I have no medicine [Coartem - artemether + lumefantrine] to treat malaria. So, in stock I just have zinc and ORS, and it happens every month ... sometimes I stay so up to three weeks with medicines stock-out". (Participant 5: 32 years old female, APE).

Regarding the difficulties/challenges faced by the APEs in the treatment of malaria, diarrhea and pneumonia, overall the interviewed supervisors stressed that they feel that the APEs have faced difficulties in diagnosing and treating the diseases mentioned above, especially due to lack of some essential commodities for this purpose, particularly RDTs and anti-malarial, lack of supervision and consistent or regular follow-up as well as refresher training, especially for pneumonia diagnosis and clinical malaria in little babies.

"The difficulties regarding the diagnosis and treatment of malaria, diarrhea and pneumonia has always focused on the lack of some essential materials such as RDTs and timers as well as stock out of anti-malarial. Currently they have timers but it still having some functioning problems related to respiratory counting". (Participant 3: 23 years old female, SUP).

When asked about how and what they have done to overcome these difficulties, the supervisors stated that they have done what they can, especially, maximizing the time of contact with APEs during supervision visits, i.e. having time to go with him to community for observation diagnosing and treating and conducting lectures, through further explanations using the APE manual and giving some support via mobile phone when some APE ask for or call for this purpose.

"The supervision visits have played a very important role in solving such problems. When I go to the community for this purpose I use to explain to the APEs on how to diagnose and treat major diseases such as malaria, diarrhea and especially pneumonia". (Participant 1: 28 years old female, SUP).

However, as they recognized, due to financial, geographic and time constraints, it has been difficult to pay enough attention to these challenges faced by the APEs. But as previously stated, they believe that if there were more resources it should be easier to address these problems/challenges by having more face to face contacts with the APEs or providing mobile phones and airtime to allow them to be frequently in communication with APEs. For further

elaboration of APEs performance based on the testimony of APEs and supervisors as well as observations see Svanberg's separate formative research sub study (2012)[1].

Table 4: Main problems/challenges APEs face – APEs perspectives

- Geographic and transportation constraints for traveling to the health facility for data submission and drug collecting - Drugs and commodities stock out - Lack of equipments/commodities - Difficult in diagnosing pneumonia in little babes due to timers faulty and some miscommunication with mothers/caregivers - Difficult with diagnosing malaria when there is no RDT - Difficult with distance when conducting house to house visits - Lack of community support.

1.3 APE Supervision and support

1.3.1 Who supervises the APEs and how

As established by MOH, the APEs are supervised by the health facility based supervisor on a monthly basis. According to such statements the HF supervisor should be a preventive health officer; however as some health facilities don't have preventive health officers the maternal and child health nurses can be the health based supervisor as they have strong involvement with the communities. Thus, it was found that out of five health facilities based supervisors who participated in this study three are preventive health officers and two are maternal and child health nurses.

In general the health facility based supervisors conduct supervision visits meaning that they have to travel to each community once per month. It is stated by the MOH that during such supervision encounters the health facility based supervisor have to verify the registers and drug stocks, observe the APE performing his tasks and ask for the challenges faced.

> *"I have to conduct face to face supervision meaning that I have to go across the APEs communities in order to oversee their work and enquire for their challenges"* (Participant 1: 28 years old female, SUP).

Besides the supervisor have had some monthly contacts with APEs when they come to the health facility to submit data and collect drugs.

> *"As it has been difficult to supervise the APEs on a regular basis due to geographic and transportation constraints I use to verify their forms and ask about their daily work as*

[1] Marten Svanberg conducted an observation study on APE's performance as part of the inSCALE formative research exercise and towards master's research at the Karolinska Institute, Sweden. He analysed the results in the context of APE reflections on their own performance and supervisor reflections on APE performance.

well as the main challenges they face when they come to here [health facility] to submit data and collect drugs". (Participant 4: 32 years old female, SUP).

It was also cited that quarterly the district supervisor, a clinician and the district manager of deposit of drugs (person responsible for the district drug management), have visit the APE for supervising purposes. Overall, the district supervisor use to check to what extent the APE work is being performed under the MOH guidelines, the drugs and commodities are in place and ask about the main challenges faced as well. The clinician who normally goes with the district supervisor uses to observe the APE performing and provide some technical advice and on-job-training when needed.

"In general the district supervisor, a clinician and the manager of deposit of drug at district level have conducted quarterly APE supervision to ensure that the APEs are working as expected ... However, due to some challenging factors they use to wait for us [provincial personnel including Malaria Consortium] to go together as when we go to the district we take a car". (Participant 3: 52 years old male, IMP).

The provincial coordinator of APEs and Malaria Consortium make supervision once per semester (twice per year), to assess the overall implementation of the APE program. In this supervision there are visited some APEs as a sample for the entire district. Overall in these encounters it is observed the APE performance and discussed the main challenges and the best ways for overcoming and solves such challenges as well.

"Twice a year I or someone of the community health department go to each district to supervise the APE work as we need to confirm in the field what has been made and how the things are going on... however, as part of our partnership with Malaria Consortium we use to go there with a Malaria Consortium team which has been good to ensure that we are working together for better community health". (Participant 3: 52 years old male, IMP).

1.3.2 Main duties of health facility based APE supervisors

As stated by the MOH, the supervisors who participated in this formative research confirmed that in general their duties as supervisors are to receive, compile and submit to the District Health Office the monthly data submitted by the APEs and supervise the work conducted by the APEs, through activities supervision visits where they verify the record books and the balance and conservation of drugs by APEs, check the APE performance and ask about challenges as well. During the community supervision visits the health based supervisors use a tool for guiding purposes and provide some technical support/on-job-training.

"I receive and compile the monthly statistics submitted by the APEs, and then send to the district [district health office]. Also I visit the APEs to verify the record books, quantity of available drugs in their kit of medicines as well as the way they have been store the kit...". (Participant 1: 28 years old female, SUP).

> "*Sometimes I use to conduct supervision visits to verify how they have been performing their tasks, drugs storage and whether they fill the record book according to standardized norms, provide technical support, ask for the challenges faced while conducting their work in the communities and planning APE supervision activities".* (Participant 3: 23 years old female, SUP).

Besides the task of overseeing the APE and the health facility supervisors, the district supervisor has the task of coordinating the logistics of APEs, in order to ensure that all resources are in place and promptly available to the APE. It was also stated that they have been planning all the supervision activities and completing district plans to follow up the APE activities in the district.

> *"I coordinate all the logistics of the APEs work in the district, ensuring that all equipment and drugs will be available for the APEs, verify the supervision plans completes by health facility supervisors and make some supervision visits to assess how the APE are working in their communities".* (Participant 6: 23 years old male, SUP).

1.3.3 Tools and support received to help with APE supervision

According to the supervisors they receive forms for guiding during the supervision visits. They also stated that receive transport and daily allowance for supervision.

> *"Sometime we get some support in forms for facilitating our supervision, transport and daily allowance for supervision visits".* (Participant 2: 39 years old female, SUP).

Regarding transport allowance, job aids and refresher training as well some of the supervisors interviewed stressed that such support has been received on a non regular manner. Some supervisor participants stressed that they did not receive any support relating transportation for long time.

> *"Sometimes we receive some subsidy to buy fuel for transportation... but since we've received in last year until now it never more happened and we do not know when it will be possible to go to visit the APEs in their communities".* (Participants 2: 39 years old female, SUP).

> *"Since I was trained by you [Malaria Consortium], I no longer received a refreshment or supervision materials like some books or leaflets related to the supervision activity... in fact we haven't enough support and consequently we do not perform effectively our tasks and what is stated by the ministry [MOH]".* (Participant 3: 23 years old female, SUP).

1.3.3.1 Supervision received and supervision would like to receive

When asked whether they received some type of supervision, all supervisors interviewed said that irregularly they have received some supervision visits from the district supervisor and

provincial coordinator in partnership with the Malaria Consortium. According to them, this supervision has helped them a lot because it allows them to exchange some experiences and discuss challenges faced with their managers. The desire for more such supervision was expressed.

> *“Sometimes the district supervisor comes here with the provincial supervisor to verify how my work is going...".* (Participant 4: 32 years old female, SUP).

> *"...during these visits our supervisors and partners [Malaria Consortium] discuss with us many issues related to APE work and supervision and together discuss best ways of overcoming the main challenges".* (Participant 6: 23 years old male, SUP).

> *"Although not regularly, when they comes to visit us I feel happy because I get instructions on how to improve my knowledge about supporting APEs work. So I feel this way that it is conducted is very good... only say that it should be more frequent or regular...”.* (Participant 2: 39 years old female, SUP).

1.3.3.2 Supervisory reporting on APEs work

When enquired about to whom and how they report the APE work, the supervisor participants revealed that have reported to the district coordinator mainly through monthly reports in the paper based format. Also they stated that in some situations such as when speedy communication is required with the district coordinator for statistics for clarification they sent a SMS using their own resources.

> *"All my activities related to the APEs I have to report to my supervisor [district supervisor]. Typically I report through a compiled form which summarizes all the statistics submitted monthly by the APEs".* (Participant 2: 39 years old female, SUP).

> *"Normally I report my activities to my district supervisor in a monthly basis. But when there is a specific reason* statistics fill clarification *or emergency I use to send a SMS which is quick".* (Participant 3: 23 years old female, SUP).

Regarding the frequency of those reporting, it was found that while some supervisors stated they are comfortable with the current reporting process others stressed that sometimes the reporting process to the district level has been irregular as some supervisors feel that some colleagues don’t strictly meet the reporting deadlines. However, they stated that no-one of high level of reporting push-up for the report submission or deadline fulfillment which was felt as a gap.

> *"I use to compile the data submitted monthly by the APE and after that send to Massinga [District headquarter]... I think the current reporting process is ok...".* (Participant 1: 28 years old female, SUP).

> *"...You know, I feel that our reporting system doesn't work appropriately because I know that many supervisors do not report their work in a regular basis and no-one ask for it which isn't good...".* (Participant 3: 23 years old female, SUP).

Besides almost all the supervisor participants felt that in general they don't complete a formal/good report i.e. they only compile the data submitted by APEs and then submit to their district supervisor.

> *"I feel that our reports aren't complete because it would be better if we completed a full report based in a common template".* (Participant 4: 32 years old female, SUP).

When asked about what should be improved in the current reporting process, some supervisors stressed that they are comfortable with the current process while others stated that it should be more useful by for instance training (and re-training) them on the importance of the reporting process as well as on how to complete a good report. It was also argued that should be better to be provided a report template.

> *"For me it should be better if the ministry provided a refresher training to reinforce and sensitize us that the reporting process is important to our entire work, to teach us on how to complete a good report as well as provide us a report template".* (Participant 1: 28 years old female, SUP).

1.3.3.3 Supportive people and contacts with them about APE work

Following the general discussion about support provision on the APE work, it was possible to learn whom the APE participants considered most fundamental in providing support to their work. According to the APEs, in the case of support to their work, depending on the type of subject, they have asked mainly for their supervisors. When faced with challenges related to technical and logistical aspects of their work they have sought support from their health facility supervisors and sometimes the district supervisor, through mobile phone. However, when the subject is related to aspects of community level or that can be solved locally the APEs stated that they have asked for the support of the community leaders who have successfully helped on issues related mainly to the community mobilization.

> *"When I face a problem with my work I have sought the help of my supervisor because she is the person responsible for me and any problem that I might have and I cannot solve it alone she is the person who can help me".* (Participant 3: 28 years old male, APE).

> *"Sometimes if the problem is related to the community mobilization, I have asked for the community leader's help, especially for purposes of attending the lectures organized by me or by some health worker officers when they come to our community for this type of work"*. (Participant 9: 29 years old male, APE).

> *"Even the district supervisor I used to ask for support through mobile phone when stays many days without receiving the kit of medicines".* (Participant 4: 41 years old female, APE).

Overall the APE mentioned that the main people consulted who were no technical are the community leaders. Only one APE mentioned that he asked twice for the support of a school, mainly the head and teachers to help in mobilizing children to attend a lecturer and reinforce the message. Perhaps, these could be seen as potential people to support the APE work at community level as the teachers are very respected people in the communities.

> *"When I want to organize a lecture for reinforcing messages about disease prevention, I sometimes ask for the head or some teachers of school for mobilization of children and the community to attend the".* (Participant 12: 38 years old male, APE)

Regarding the contacts related to their work and the frequency and type of issues discussed during these contacts, the APEs stated that have had contacts but irregularly with their supervisors at the health facility. Such contacts happened mainly through supervision visits and during the monthly data submission but rarely via mobile phone due to the lack of airtime for this purpose. Meanwhile, when asked about the frequency on which they maintain such contacts with the APEs, the supervisors interviewed also confirmed that they have interacting with the APEs in an irregular manner; however, they stressed that depending on specific circumstances, for example, a visit from the provincial or national level, the frequency of such contacts can vary from month to month.

> *"I have had contact with my supervisor because sometimes she has been visiting me here in the community to see how I'm taking care of sick children and to know what are my problems... but that was last year, this year she has not visited me yet".* (Participant 9: 29 years old male, APE).

> *"Sometimes the health facility supervisor has visited me but now is increasingly difficult for him to come here in our community because of lack of transportation and because he has many works in the health facility... so, sometimes I use to get into contact with him when I go to the health facility for submitting data and collecting drugs. At these times he takes time to see how I filled out the statistics and ask how the community members are receiving my messages".* (Participant 8: 28 years old female, APE).

> *"My interaction with the APE depends on what we have to do. But it has not been regular as I would like... sometimes the APEs themselves call to me or I call them to ask for some specific information. For example, when we have a province visit from the APEs provincial program staff, we take the opportunity to discuss issues related to our work".* (Participant 4: 32 years old female, SUP).

The APE respondents said that during the contacts with their supervisors they have discussed several issues such as diagnosis and treatment of diseases, difficulties faced during the course

of their work in the community, availability and storage of drugs, verification of record books and the summary form compiled monthly, assessment of the relationship between the APE and community members as well as preventive activities.

> *"When the supervisor comes to visit me he use to ask some questions about how the my work is going, verify the amount of medicines and how I have stored it, verify how I fill the record book and also ask for my house to house visits and preventive tasks."* (Participant 1: 33 years old male, APE).

In relation to what have happened during the contacts they have with the APEs, overall the interviewed supervisors stated that they talk about different subjects, especially issues related to how the statistics have been collected, verification of the record books as well as the monthly summary form for submitting data, the availability of drugs and commodities such as RDTs and how they have been stored, the level of community involvement and challenges faced while interacting and teaching the community how to effectively prevent diseases, clarifying some doubts related to referral of critically ill patients to the health facility and for example some difficulties related to the diagnosis of malaria when there is no availability of RDTs and pneumonia as the existing timers haven't work properly.

> *"In such contacts we talk about several things like the difficulties in the use of RDTs, difficulties related to the preventive activities and availability of drugs...also we talk about feedback of patients referred to the health facility".* (Participant 5: 25 years old female, SUP).

> *"During such contacts I usually observe how the APEs are working and also I verify the statistics (record books and summary form); when something is wrong I ask them to review and correct".* (Participant 3: 23 years old female, SUP).

> *"What happens during these meetings is verification of the availability and storage of drugs and other essential materials. Also I review and explain some specific doubts related to the treatment of some diseases".* (Participant 6: 23 years old male, SUP).

However, almost all the APE participants expressed some concern related to the perceived gap in such contacts between them and their supervisors. While to overcome the lack of frequency of contact with their supervisors some APEs are using their own mobile phones and airtime to report or solve specific challenges others are still facing some challenges to establish regularly such contacts due to financial constraints.

> *"I'm worried with the ways these contacts have been conducted as it seems that they [supervisors] aren't interested in solving our problems…. It has been difficult to interact frequently with our supervisor as even when I go to the health facility often I can't see him. But when I have some specific doubt I call to him".* (Participant 9: 20 years old male, APE).

> *"Sometimes I have faced some difficult during my work that should be quickly solved by a simple call to my supervisor but as frequently I haven't had enough airtime in my mobile phone I prefer to wait until he comes to visit me or I talk to him when I go to the health facility".* (Participant 3: 28 years old male, APE).

Although it was recognized that the contacts with their supervisors have been irregular and insufficient, the narrative from the entire APE cohort revealed that they like such contacts and reflected their desire to communicate more openly and frequently with their supervisors to solve their problems especially the rising doubts which need a quick solution.

> *"Our supervisors should discuss openly with us and be more present in our work for explaining all the important things to us and tell us how they want our work to be performed... thus we can easily follow the rules that they need to be followed"*. (Participant 4: 41 years old female, APE).

> *"I like the contacts that I have with my supervisor as it allows me to improve my skills. But I need to have more contacts with my supervisor in order to gain more experience and improve permanently my performance".* (Participant 6: 28 years old male, APE).

> *"I like the contacts we have with our supervisors and would be good for our work that it should be more frequent not just wait until he comes to visit us or when we go to the health facility for submitting data... because problems do not wait and may raise at any time...".* (Participant 7: 29 years old male, APE).

When asked about how these contacts should be more useful, the interviewed APEs stated that it would be better to establish a mechanism of regular communication and effective follow up to allow them to permanently improve their skills. To achieve this desire some APEs have suggested that the provision of airtime for them and their supervisors would help in increasing their interactions. Also they suggested that such contacts should include an assessment on their performance.

> *"These contacts would be made more useful if it could include a clear process of monitoring our work in the community, thorough regular visits or calls... it would allow them [supervisors] to permanently support our work at least with respect to the technical issues".* (Participant 12: 38 years old male, APE).

> *"To be useful these contacts would be more frequently to allow me avoid the same mistakes and keep in mind what have been previously discussed in the last contact".* (Participant 11: 46 years old male, APE).

> *"To be useful it would be better that such contacts were more frequent and included an evaluation of our performance... I think the provision of airtime for us and our*

> *supervisors would help for increasing such interactions as we already have mobile phones".* (Participant 3: 28 years old male, APE).

Many supervisors also stressed that these contacts would be more useful and productive if they were more frequent; in addition, they said that it would be better if such interactions had longer duration, paid more attention to issues related to disease prevention in the community and included an effective mechanism of following up the APE work.

> *"To be more useful and productive these contacts should be established frequently for ensuring further discussion related to the APE work"*. (Participant 2: 39 years old female, SUP).

> *"As they are working alone in the communities and far from the health facility it would be better if these contact were regular and took enough time for discussing all the APE concerns"*. (Participant 1: 28 years old female, SUP).

> *"During these contacts If we paid more attention in preventive issues and establish a systematic way of monitoring the APE performance I think it would be of crucial importance for ensuring good community health outcomes"*. (Participant 6: 23 years old male, SUP).

According to those statements it was found that both the APEs and their supervisors recognized that such contacts aren't enough and indeed they would like to have more contacts. However, for achieving this desire, the interviewed supervisors and implementers acknowledged that they are concerned about the challenges related to lack of financial resources, availability of time for the supervisors as they have other tasks in the health facility and geographic barriers.

> *"I would like to have more contacts with the APEs because it would allow me to permanently support and follow up their work. But the lack of financial resources faced by the entire health system and the long distances between the communities and the health facility has been the great challenge to overcome".* (Participant 2: 39 years old female, SUP).

> *"I know that the contacts between the APEs and their supervisors aren't enough but it reflects a complex lack of resources faced by health system... for example it is desired that APE supervisors haven't high workload in the health facilities and have enough resources to be in permanent contact with the APEs... unfortunately, without the help of our partners it won't be achieved".* (Participant 1: 47 years old male, IMP).

According to the perception of some supervisors and implementer respondents it was felt that there is a need to improve the entire APE supervision process through more support related to financial contribution mainly for transportation and communication purposes, effective planning of supervision activities, refresher training on supervision matters, provision of

commodities such as handouts, paper, pens and indeed support on how to effectively coordinate all the supervisor responsibilities in the health facility in order to avoid challenges related to high workload acting as an impediment to the effective engagement of the supervisors in the APE work.

> *"I think that if our health partners like you [Malaria Consortium] covered our transportation and communication costs it would be enough for effective APE supervision as it would allow us to give more technical support to our APEs"*. (Participant 2: 39 years old male, IMP).

> *"You know an APE supervisor has many other responsibilities in the health facility therefore sometimes it is normal to have high workload as the MOH haven't enough human resources. But I think that the main problems are the lack of coordination of such responsibilities and the lack of commodities for conducting effective APE supervision. Therefore I think that our partners could support us by providing technical assistance on importance of supervision activities to our managers, planning and coordination and indeed providing essential commodities a such as computers for data management and storage and report writing purposes, supervisor job aids…".* (Participant 2: 39 years old female, SUP).

1.3.3.4 Receiving information about APEs work

According to most of the APEs who participated in the study, they have not received information about their performance and the APEs program on a regular or systematic basis. While a few respondents said they rarely receive such information, and when they receive it has been in an informal way, most of the APEs stressed that they have never received such information.

> *"No one ever came here to evaluate my performance or give me information about my work ... if it is been good or bad ... and about the APE Program in our district I only heard from colleagues that one APE have abandoned...".* (Participant 3: 28 years old male, APE).

> *"I have not received information but I wonder if I'm doing well or not my work... because if someone let me know that I am not doing a good work I can correct my mistakes and improve my performance... Also I would like to know about how the others APEs in the district are working"*. (Participant 8: 28 years old female, APE).

> *"I can say that sometimes I get some information from my supervisor on how is my work going... for example, I've received some information with respect to the missing of some statistical data or the small number of patients treated in one month... but this information was provided quickly when he met me on my way to the pharmacy for collecting the kit of drugs …".* (Participant 6: 28 years old male, APE).

However, when asked about the importance of this information to their work and whether they would like to receive it, all the APEs agreed that the provision of such information on a regular and effective basis would be essential to improve their performance and work motivation.

> *"It is important to provide us this information because it would help us to ensure good quality provision of health care in the community and motivate us more to get better if we knew where we did wrong".* (Participant 4: 41 years old female, APE).

> *"I would like to receive information about the course of my work because it would be important to know the status, evolution and trends of the health in my community since I started working... unfortunately I still working without knowing anything about this ..."* (Participant 12: 38 years old male, APE).

> *"Sometimes during our work I can make some mistakes without knowing what is happening… so I think that the provision of information about my performance will be useful for me to learn from my own mistakes and motivate me to improve my performance in the future".* (Participant 7: 29 years old male, APE).

1.3.3.5 Interacting with other APEs

The APE participants stated that sometimes they have interacted with other APEs. Although it has been conducted in an irregular or informal way, they said that sometimes at the end of each month (when they go to the health facility for submitting data and collecting drug purposes), they interact with each other. Also they stated that sometimes after they have held some meetings together it is possible to interact a little bit as well as via their own mobile phone and money.

When asked to indicate which issues have been discussed during such "informal" interactions, the APE participants said that they use the encounters to talk about several issues, ranging from work related issues to family or personal ones. With respect to the issues related to their work, they have been discussing issues related to sharing of experiences related to preventive and treating activities, especially the best ways or effective approaches adopted in mobilizing community members for behavior change related to personal or collective hygiene, environment control for malaria prevention, diagnosis and treatment of sick children, dosages and management of the medicines stock and other challenges faced during the APE work in the community.

> *"I do not always speak with my APEs colleagues, but when I have credit on my phone I avail to talk a bit about our work ... if the difficulties I face are the same with my".* (Participant 5: 32 years old female, APE).

> *"When we meet in the health facility at the end of each month, we talk about many issues related to our work. For example we talk about the ways to better manage drugs, mobilize people to build latrines and cover ponds around their homes to avoid the*

development and proliferation of mosquitoes as well as the difficulties faced in diagnosing pneumonia in children...". (Participant 1: 33 years old male, APE).

"I have talked more with my APEs colleagues when have had APEs meetings with our superiors... that time we avail to talk about various issues such as the tendency of the weight of the major diseases in the community, dosages, forms of treatment of patients and how to improve sanitation". (Participant 12: 38 years old male, APE).

Also the APEs who participated in this FR stressed their desire to communicate frequently with their fellow APEs in order to learn more from each other and indeed exchange their experiences in conducting APE work in the communities. According to them, these interactions aren't only useful for improving their performance and motivation to work but also make them feel as part of the APE team which is working to ensure better community health in the district. According to these participants, it would be an improvement if all APEs had mobile phones or airtime and APE meetings were established regularly.

"I like these contacts with other APEs because it allows us to share experiences about our work in the community, but to be useful should be more frequent". (Participant 1: 33 years old male, APE).

"These interactions with other APEs are important because they avail learning from each other and makes us feel as part of one big family working towards the same goal which is the health of the community ...". (Participant 5: 32 years old female, APE).

"I think if every APEs had mobile phones it would be easier to communicate regularly for exchanging experiences and improving our work in the community ... for example while I might be facing difficult in teaching people on how to avoid diarrhea some fellow APEs knows might not and indeed should share with me their experiences vi mobile phone..." (Participant 3: 28 years old male, APE).

1.3.4 Extra tools and support that would be useful according to supervisors

When asked about what extra support and tools/equipment they would like to receive the supervisor respondents stressed that it would be of crucial importance if the MOH provide all the necessary resources for conducting an effective supervision such as transport allowance on a consistent and regular basis, stationery such as pens, papers and forms, job aids, supportive supervision on their work, refresher training, supervisory subsidies, airtime to allows them to frequently communicate with the APEs and between themselves, computers for data management and storage and planning purposes and template for report completion as well as training in using the data submitted by APEs. Again it was stressed that transportation constraints for mobility purpose across the APE communities is a key issue for effective APE supervision.

"I would like to be supported in transportation to the community or if it was possible the ministry would provide a motorbike to help me to move around the communities without any concerns because currently due to transportation constraints I don't conduct adequately my tasks; as a consequence the face-to-face visits are irregular and even when it is possible I don't pay an adequate attention because i have to visit all the APEs in the same day and back home before night... I feel it doesn't allow me to provide an effective APE support and follow up". (Participant 1: 28 years old female, SUP).

"It would be better if the ministry provided us more support in essential materials such as job aids, books and handouts on the supervision, paper and pens for compilation of statistics and, if possible supervisory subsidy and airtime to allow us to call APEs...you know as it isn't possible to frequently visit them [APEs] providing us with airtime will be useful to improve our communication and indeed give them much more technical support". (Participant 5: 25 years old female, SUP).

"For me, one of support needed is a computer to improve the data management and storage of all information related to the APE work". (Participant 6: 23 years old male, SUP).

1.3.5 Time spent on APE-related work – supervisor perspectives

Overall it was felt that time spent during the supervision isn't enough due to constraints related to transport and the distance required to travel across the communities to reach all the APEs. Regarding the weekly and daily time spent on work related to the APE, the supervisors interviewed said that it depends on the type of activity. Generally, as they have other tasks in the health facility, the supervisors stated that they spent an average of one day per week and two hours per day performing tasks related to the APE supervision. However, they stressed that it is not strict, as often they have spent five days of the week working for APE issues, especially when there is supervision visits scheduled.

"As I have other tasks to perform at health facility, overall I spend an average of 3 days per week for planning APE and supervision activities as well as interacting with APEs". (Participant 2: 39 years old female, SUP).

"The time spent on APE activities depends on what I have to do. Overall it does not take long time per day... two hours or three are enough. But when there is a problem that I have to help the APE to resolve or when sometimes I have to conduct supervision visits the time spent as been long...".(Participant 4: 32 years old female, SUP).

However, some supervisors have recognized that they haven't had enough time to be effectively engaged on the matters related to the APE work. Others stated that they really get engaged in the work related to the APE only when they go to supervision visits; the main reasons related to this are related to the fact that they have other tasks in the facility, high workload and lack of resources for effective APE supervision.

"I really work for the APEs when it is possible to go to the community to conduct supervision visit because I've been very busy performing other tasks here at the health facility where normally I have been a lot of work ... so I feel we as supervisors haven't enough time to pay more attention to the APE work, especially in issues related to permanent support and problems solving. (Participant 3: 23 years old female, SUP).

"As we haven't enough resources especially financial, we do not perform effectively our supervision tasks. For example, my supervision visits are irregular due to financial constraints and even when I get some resources to conduct a supervision visit, overall I spent an average of two hours with one APE because I have to visit all the four APEs in the same day ...".(Participant 2: 39 years old female, SUP).

1.3.6 Supervisor motivation

Regarding the motivation to do the supervision, the supervisors who participated in this study also said that they conduct their work because they like to help the APE to deliver good work in the community. Some interviewees highlighted that it is an integrated activity in their normal responsibilities as an employee of the health system to provide good quality of care. So, as overall the APEs are less educated the supervisors stressed that they are motivated to ensure that all the APE perform as well as learned and standardized by the MOH, which is fundamental to ensure good community health outcomes. In addition, some supervisors stated that the APEs are helping the communities, especially those living very far from the health facilities.

"I do this work because I like to help the APE to perform a good work. Also because I've been trained for this..." (Participant 2: 39 years old female, SUP)

"The supervision of the APE is part of my responsibilities as health worker. I'm aware that the APEs are less educated therefore when I do this work I know that I'm trying to ensure that they are going to provide good quality of care". (Participant 1: 28 years old female, SUP).

"What motivates me to do this work is because I'm aware that they [APEs] are helping the community, especially who live in the remote areas... without their work, the people would travel for long distances for reaching the health facility". (Participant 5: 25 years old female, SUP).

1.3.7 What would make APE supervisors stop doing their work

It was also felt that despite some faced difficulties nothing would make them stopping work because they are committed to ensure good quality of community health care. However some supervisor respondents said that they would stop working due to lack of motivation created by lack of resources such as transport, subsidies, job aids and other essential resources to carry out effective supervision.

"Nothing would make me stop doing this work because for me it is like a 'love the shirt'. It is gratifying to see a healthy community even in remote areas." (Participant 4: 32 years old female, SUP).

"What would make me stop doing this work is the permanent lack of transport and resources to conduct an effective supervision... sometimes I use my own money to call to the APEs for asking about their work". (Participant 3: 23 years old female, SUP).

1.3.8 Main challenges supervisors face

With respect to the main challenges faced in supervising the APE work, the supervisors interviewed identified constraints related to transportation to the communities for supervising visits and the availability of time to pay more attention to issues related to APEs work.

"The main challenge in the supervision of the APEs work is the transport because to make quality supervision, the supervisor has to move to the community where the APE is working" (Participant 1: 28 years old female, SUP).

"The issue of time is very serious, here in the health sector we never have time to do activities as should be done because the health facilities are always full of people who want to be attended then it is not easy to devote enough time to the APEs activities". (Participant 6: 23 years old male, SUP).

In relation to APE supervision challenges/problems, the implementers stated that the biggest challenge in supervision is because some APEs supervisors are not from clinical background and they cannot always help the APEs in a correct way.

"One of the major problems is that not all supervisors of APEs have very strong knowledge of the clinical area and therefore cannot always assist APEs in addressing their problems correctly during the supervisory" (Participant 1: 26 years old female, IMP).

In relation to what can help to solve problems related to lack of transportation and time to effectively conduct supervision activities, supervisors interviewed said that it depends on the desire of the higher level or a possible support from partners of the health system.

"In fact, these problems of transport and availability of time does not depend on a single supervisor like me. It must be the district to set clearly the time that we must give to the questions related to the work of the APE ... perhaps you [Malaria Consortium] can help us in the transport". (Participant 6: 23 years old male, SUP).

When asked about the supervisory tasks that they have performed better or with some difficulties, overall the supervisors who participated in the study said that what they do best is the observation of APEs while teaching and giving preventative-related recommendations

during the house to house visits or conducting lectures. In relation to which supervisory tasks they have found most difficult, overall some supervisor respondents recognized that as all of them don't have a clinical background they have been facing some difficulties in supporting the APEs on clinical related problems/challenges. Others revealed that they cannot use the data collected and submitted by APEs as well as writing a good report.

> *"What I understand and I do best is the observation of the house to house visits and lectures conducted by APE… if some issue has been explained wrongly I can easily understand and then correct the APE because my background is related to the component of prevention".* (Participant 4: 32 years old female, SUP).

> *"As I haven't strong clinical skills I feel that I don't pay more attention in issues related to diagnosis and treatment of diseases while conducting supervision visits… but when a APE ask for support in this area I use to check in the manual or my colleagues who have clinical background".* (Participant 6: 23 years old male, SUP).

> *"My biggest difficulty with the supervision activities is the elaboration of monthly reports because we were not taught on how we should do; in addition there is no a template or, standard model in which we should follow"… even I can fell that such data are interesting I don't know how to use it for local or APE benefit* (Participant 5: 25 years old female, SUP).

Thus, these participants suggested that it would be of crucial importance if the MOH or their partners especially Malaria Consortium developed an effective program for conducting regular refresher training for supervisors in order to improve their skills and knowledge related to effective supervision, data use and report writing.

Table 5: Supervisor main challenges

- Lack of financial resources and geographic barriers were unanimously identified as the most challenging factor as it has been related to the transportation and mobility constraints meaning negatively influence the ability to provide effective supervision; - It was felt that the some supervisors don't pay adequate attention to the issues relating to diagnosis and disease treatment due to a lack of clinical skills meaningless ability to adequately address some related advices; - Difficulties in elaborating monthly reports and using the data submitted by APEs were commonly cited as a challenge for many of the APEs supervisors because they weren't trained for this and there is no template for guidance purposes.

1.3.9 Suggestions for improvement to current APE supervision

From the APE, supervisor and implementer perspectives there were cited some suggestions for improving the APE supervision. There were commonly mentioned that enough resources such

as regular and consistent transport for supervision visits as well as consistent mechanism for increasing the frequency of contacts between supervisors and APEs like phone use to close the gap relating communication would improve the APE supervision.

> *"I think that if there was provided transport allowance on a regular basis and mobile phone/airtime for both the supervisors and APEs it would improve the supervision process because we would be able to conduct a regular supervision and provide frequent APE support over a call even being far from the community".* (Participant 5: 25 years old female, SUP).

Across the participant groups it was also felt that other potential solution to improve the supervision is to supply enough resources such as stationary, job aids and refresher training as well provide adequate equipment for the APEs such as timers and RDTs.

> *"There are lack of basic resources such as pens and papers, job aids and refresher training for us which if provide could enable us to conduct effective supervision. For me the MOH with their health partners like you [Malaria Consortium] should provide us these resources for better APE supervision".* (Participant 1: 28 years old female, SUP).

1.4 APE Data Submission

All the APEs stressed that they submit data monthly to their health facility supervisors. These data are related to the total number of sick people and treated diseases (detailed by age and gender), number of house to house visits and lectures conducted in the community, number of patients referred to the health facility and the balance of drugs, RDTs and essential materials.

> *"I collect data monthly on the number of people treated, the balance of medicines and the number of house to house visits conducted in the community. Then I compile and submit this data monthly to my supervisor".* (Participant 9: 29 years old male, APE).

> *"Every month I have gone to deliver data on the total number of cases of malaria, cough, diarrhea and other diseases that I seen including the total number of patients by age. These data I usually submit to my supervisor of the health facility"*. (Participant 11: 46 years old male, APE).

> *"I usually send data on the number of cases diagnosed and treated, number of attended patients by age and sex, number of lectures conducted during the month".* (Participant 10: 23 years old female, APE).

When asked if the APEs supervised submit data to supervisors, all supervisors interviewed confirmed that all the APEs submit the data to them on a monthly basis, or in each end or beginning of every month. The APEs used to send data related to their activities which contain the number of patients seen, number of diseases treated, house to house visits and lectures, including the amount of each drug that used for the treatment of diseases.

> *"I get the data from the APEs in paper format every month... where the delivery process consists in moving the APEs to the health centre where the data are submitted to me"*. (Participant 1: 28 years old female, SUP).

> *"Every month the APEs must submit a report that has information on everything they have done throughout the month, the queries they have made, observations of children and adults, treatment as well as the medicines they have used".* (Participant 6: 23 years old male, SUP).

Regarding the purpose of the data collected by the APEs and submitted monthly most of the APEs indicated that was not certain/clear because no one informed them about the use of the data. However, some APEs believe that is used to calculate the quantity of medicines needed for the next month. Others said that the supervisor use to verify the results of their work during the month. Some think that the data is used by the health facility to confirm their work in the community and report to managers at the district and province levels.

> *"I do not know much about this subject but I think it is through these data they calculate the amount of drugs that they usually give us in a monthly basis". (Participant 8: 28 years old female, APE).*

> *"I think the data I send to my supervisor use to see which the result of my work in the community is and assess whether it is going well or badly". (Participant 7: 29 years old male, APE).*

> *"The data I send to the health facility is used to confirm that I am working in the community and then send to the district and the province level for the superior also to know what is happening in the community in order to always send medicines for us". (Participant 2: 42 years old female, APE).*

Overall, it was found that both APEs and supervisors interviewed are not sure of what is actually done with the data collected and submitted by the APEs, which shows that there is a big failure and under-utilization of such data for local use. While some supervisor participants think that the data are used to identify the needs for drugs provision and where there are more problems, others said they don't know what to do with the submitted data and for what purposes it has been collected. These supervisors stressed that only receive, compile and send the data to the district level.

> *"I receive the data, compile and then send to the district level but I don't know exactly when and how it is used".* (Participant 1: 28 years old female, SUP).

> *"I think the process of situation analysis should begin with the APE, passing through the health facility, district, and then to the province... based on these data it should be analyzed many issues as well as identifying some problems related to the APE*

> *performance... so I think the district has used these data to calculate the amount of drugs needed for the APEs and see where there are some problems".* (Participant 6: 23 years old male, SUP).

When asked to mention the issues which they like and dislike in relation to the data submission process, the APE participants stressed that they like to submit data regularly (monthly) as it evidences that they are really working in their communities and indeed serves as a confirmation to their supervisors and APE program managers that they are doing something to prevent and treat diseases in their communities. Several also welcomed performance based feedback from their supervisors based on the data they submit.

> *"I like to deliver the data because the hospital [Health facility], the district and the province can know that the APE that is trained to do the work in the community is working*". (Participant 5: 32 years old female, APE).

> *"I like to submit the data so you can see how I'm working. Also I can perceive that I'm really working because I filled out such data and I can get an idea of the total number of patients I've treated during the month...".* (Participant 7: 29 years old male, APE).

> *"What I like is when I submit the data the supervisor takes that moment to check my work done during the month, and sometimes correct my mistakes and give me recommendations to increase the numbers of house to house visits and even the number of children treated".* (Participant 6: 28 years old male, APE).

However, they stressed that they have been facing a big challenge related to long distances between the community and the health facility, lack of means of transportation and especially the lack of transportation subsidy for covering the costs of travelling to the health facility. Another challenge mentioned as negatively influence the process of data submission is the poor attention given by their supervisors when they reach the health facility as in general their supervisors have been very busy performing other tasks and do not have enough time to give enough recommendations on the quality data submitted and even to discuss other APE work related issues.

> *"What I do not like is the fact that there's no transport allowance to allow me to monthly travel to the health facility for submitting data and return home... that's why always when it reaches the end of the month I have faced a great concern related to the money for transportation".* (Participant 1: 33 years old male, APE).

> *"The health facility is far away and even when I go cycling I take two hours to go and another 2 hours to return... something else that negatively influences the travelling to the health facility are the poor road conditions".* (Participant 2: 42 years old female, APE).

> *"When I go to the health facility to deliver data, the supervisor does not usually have enough time to check my data and verify if there is a mistake that can be avoided in the future... frequently when I go to submit the statistics she has been very busy and she does not give me enough attention".* (Participant 4: 41 years old female, APE).

Regarding the issue of delivery of the reports one of the implementers interviewed in this study reported having faced some problems due to delay in delivery by the APEs as well as submission in different periods.

> *"The problem I face here in the district is regarding the submission of data and that the APEs delay delivering data but also because sometimes deliver at different times which makes difficult the job of compiling the data".* (Participant 2: 24 years old male, IMP).

In order to improve the process of data submission most of APEs suggested that it would be better to introduce subsidies of transportation or mobile phones for data submission. Also some said that it would be better to submit it when the supervisor comes to the community for supervision visit as it would allow him to pay more attention on the data quality and indeed explain more deeply in case of doubt in filing the form or wrong filing.

> *"For the process of submitting data be improved the Ministry of Health should give us money for transportation which will reduce our concern related to travel to the health centre at the end of each month".* (Participant 11: 46 years old male, APE).

> *"For me this process could be improved if we were given airtime and SMS so we can send the statistical data via mobile phone... we would not be worried more about the transportation, travel time to go and return from the health centre and the time lost in the health centre in the process of data submission and drug collection as well ...".* (Participant 7: 29 years old male, APE).

> *"To improve this process I think would be best that the supervisor would all take the final months of data... because then we will not concern ourselves more with the money for transportation and he will have enough time to answer all our questions about completion or failure to complete the record book".* (Participant 12: 38 years old male, APE).

In relation to what could be done to improve the process/system of data submission, the supervisors interviewed said that in general the actual process of data submission is good as well and meets the standards specified by the Ministry of Health. However they also stressed that it would be easier and faster if it was possible to use mobile phones for data submitting purposes.

> *"The process of submitting data via paper is good and it's how we were instructed by the Ministry of Health for all data sent to the district".* (Participant 2: 39 years old female, SUP).

"I do not have major complaints about the process of sending paper based reports because it is always better to bring to the health facility a completed report, but the use of mobile phone should make this process easier and faster especially for reducing the delays and indeed the transportation constraints." (Participant 5: 25 years old female, SUP).

1.5 Implications

APE work

1. There is a good relationship between APEs and their communities. APEs value this support and the relationship while the communities are aware of the importance of APE work, use the APEs and respect them. Intervention design should consider highlighting community recognition and respect and should use terminology and concepts that APEs find meaningful such as reputation, respect and recognition.

2. APEs feel that they have made a commitment to their community and report feeling duty bound to continue what they consider to be an important job that they are specially trained for. They care how they are viewed in the community and feel that the essential services they provide enhance their reputation. They find it gratifying to see their work contributing to a healthier community and are motivated by saving lives. Intervention design should therefore appeal to APEs sense of duty and local pride and should highlight the importance of the job, that they were selected by the community, that they have special training to help their community and the positive impact of their work.

3. One area where APEs need support is the diagnosis of pneumonia; for example, one frequently cited challenge faced while diagnosing pneumonia was the timers faulty. It was mentioned that some timers don't work appropriately as there is need to be always calibrated; it was also cited that it is possible to display different values every time that the APE try to count the children heart beats. It can be a faulty related to batteries or there is a problem with the provided brand or there was a problem with this provided serial number. In this context, support for this could be included in phone supervision, in SMS messages or through interactive job aids.

4. APEs currently report problems to supervisors but see little action taken. If the intervention encourages APEs to share problems with supervisors via the phone support also must be provided to supervisors so they are able to solve the problems.

5. The proposed innovations seemingly meet identified needs. For instance key challenges faced by APEs relate to the appropriate identification of symptoms due to a range of issues but in part a shortfall in effective support supervision. Mobile phone facilitated communication with supervisors may help address this need.

6. Intervention designers need to be aware of constraints to APE work that cannot be addressed by the technology intervention such as poor communication by mothers regarding their child's illness.

7. Key APE problems include a lack of drugs and RDTs as well as access to means of transport (finances and vehicles) for house to house visits and for monthly visits to the facility. If the proposed interventions can reduce the need for APE transport then it will meet an identified need however since APEs will still need to travel to the health facility to collect drugs on a monthly basis this appears to be unlikely. It would therefore be to APEs and the program's advantage to explore whether the interventions can in some way assist with addressing the lack of supplies. The potential for having an impact is most likely linked to whether lack of communication is currently a contributing factor.

Supervision

8. Some supervisors highlighted that conducting supervision at the health facility is a challenge due to other workload demands while in the community challenges relate to the time and cost of travel. While the interventions may to a degree help alleviate the travel burden designers also need to be mindful that the supervisors are time poor and may be challenged by allocating sufficient time to make supervisory calls.

9. Supervisors often lack resources for community visits. This needs to be considered if supervisors are asked to conduct targeted supervision as they may have no means of reaching the community.

10. Current supervision includes checking records and some community visits with checks on performance. Performance focused supervision could be enhanced through the use of phones or by targeting poor performers identified through data submission. Supervisors will need to be provided with clear instructions and guidelines on how to provide performance supervision over the phone.

11. Regarding the APE supervision there is three levels[2]: HF based supervision, district supervision and provincial supervision. Despite there are different people who supervise the

[2] According to the MOH norms the APE is directly supervised by the health facility supervisor (in Massinga district there is 6 HF supervisors). In practice it occurs to a certain level because of the cited transport and geographic limitations; it was found that since January some APEs don't receive community supervision. However the HF supervisors use to make some contacts with the APEs when monthly they go to the HF for submitting data and collecting drugs. Besides the HF supervision the district supervisor used to make quarterly community supervision to the APEs to ensure that the APE work is on track. However, it also has been irregular because of transport and geographic barriers. The provincial supervisor/coordinator with Malaria consortium make twice supervision per year; i.e, one per semester.

APEs and there is an apparent lack of a clear supervisor's job description[3], the HF based supervisor is the main supervisor as he supervises directly the APEs. However, for the success of the proposed intervention inSCALE should consider the lack of clear supervisor's job description as well as the coordination with the health facility managers as a key issue that need to be previously addressed. Thus, the phone should be given to the Health Facility based supervisor as he is who directly supervise the APE

12. APEs would like more communication with each other for both technical support and to share lessons. They feel this would help their performance and also their motivation as they like to feel part of a collective or 'big family'. This shows the utility of the closed user groups. This desire to be part of a functional collective can be harnessed by the inSCALE project to increase motivation.

13. Some APEs reported that they desire information on the status, evolution and trends of health in the community. The intervention design team should consider how the SMS messages and the data submission can be used to achieve this.

14. Supervisors and APEs welcome more interaction, contact and general feedback and APEs specifically desire performance based feedback. Any supervision conducted over the phone or targeted supervision visits need to include this element though a supervisor job aid or additional training may be required as some supervisors question their ability to provide such support. Supervisors recognise the value of quality APE work and therefore the concept of quality could be used to harness supervisor support and action.

15. Some supervisors reported that they need support to use the data that are submitted. The intervention design team should ensure that they provide more than an electronic data submission and collation tool but also think about how the data can be best used and then support supervisors in this use.

16. APEs and supervisors are enthusiastic about being able to call APEs on their phones and already do with positive results. Most APEs would like more frequent contacts with their supervisors and supervisors also recognise the importance of contacts. The key barrier is cost so a closed user group may help support an already valued practice.

Data submission

17. Problems in the completeness of data submitted were reported. While it was found that the APE submit data on a monthly basis it was felt that both the APEs and their supervisors face some challenges related to completeness and timely submission at the APE side and timely/constructive feedback at the supervisor side. The use of electronic submission may

[3] At the health facility there is no a formal document on the supervisor job descriptions. They are usually indicated and work under the general jobs description pointed in the APE program document.

improve this process. Both the APEs and supervisors are enthusiastic with the idea of electronic data submission as it was seen as a mean of easy the data submission process as well as enable a production of good quality data by providing a timely and constructive feedback for correctness and prevent future mistakes.

18. APEs like submitting data regularly as they feel it validates their role and proves they are doing good work for the community. They also welcome regular performance based feedback including that based on submitted data. inSCALE should consider how the intervention can reinforce positive behaviors, confirm the work done by the APE and provide feedback on their performance.

19. APEs and supervisors like the idea of data submission by phone, especially if it can reduce transport challenges. They also felt it would improve the process of data submission overall. The proposed intervention is therefore likely to be greeted enthusiastically however, given APEs will still be required to travel to the health facility to collect drugs, the actual reduction in travel time and cost may be negligible and therefore not match expectations. If this is the case the need to manage expectations should be planned for. Perhaps, it should be useful to integrate the drugs delivery to the supervision visits, i.e. when the HF supervisor goes for the monthly community supervision he should take the Kit of drugs to the APE.

20. Supervisors have limited time and can find it difficult to find time for APEs when they come to the facility. The use of a phone may reduce the supervisor's time burden but the inSCALE innovation should not assume that supervisors can simultaneously manage multiple tasks. The intervention team may need to block out times when APEs can call their supervisor or stress to APEs that they should leave a message and to supervisors that they should call the APE as soon as possible. In some cases supervisors may still be too stretched to perform and the intervention team needs to be aware of this in their planning.

21. Neither APEs nor supervisors are sure of what is done with the data collected and submitted by the APEs. The intervention design team should ensure that they provide more than an electronic data submission and collation tool but also think about how the data can be best used and then support supervisors in this use. There is an opportunity for inSCALE to demonstrate the usefulness of such data for improving APE performance and motivation and to improve the supervisor understanding of the impact of the program.

22. Data that are currently submitted are limited and they may need to be added to for performance monitoring.

Section 2: Current phone use and preferred phone characteristics

2.1 Personal mobile phone experience, use for APE work/activities and preferred phone characteristics

Summary of key findings
Use of Personal Phone for APE Activities According to all the APEs and supervisors interviewed, they used their personal phones for APE related activities. For these participants, the bulk of common functions they used are related to the calling or receiving calls, writing and receiving SMS, especially in Portuguese, from each other, and sometimes receiving or sending SMS to community leaders. **Access to Charging, Repair and Airtime** – All the APEs charged their phones either in their own home, relatives or neighbor's homes with solar chargers, using car batteries free of charge or at health facilities. Most supervisors charged their phones from the health facilities or their homes using solar chargers or car batteries. – When phones required repair both the APEs and supervisors in generally take their phones to a local and nearby informal technician for repair; however, when there is a serious problem with the phone, in general they took their phone to Massinga. – Regarding airtime acquisition both the APEs and their supervisors stated that despite some constraints related to accessibility it is available from small retail shops or dealers in their communities or nearby although airtime is a bit more expensive in some remote communities than in Massinga. Overall they got airtime at a personal cost when it is possible. Both the APEs and their supervisors stated that while they are using their personal phones for APE related activities the government never gave them airtime for this purpose. **Desired phone features** Both APEs and their supervisors described the best phone features as: – Phone brand: both the APEs and supervisors indicated the NOKIA as the most preferred phone brand as according to them NOKIA phones are common, suitable and easy to use, very easy to find NOKIA chargers and indeed easy to repair as all the available repairers know how NOKIA phones function. – Color of phone: most APEs interviewed preferred black phones while some hadn't specific preference; but this cohort of APEs stated that it would be silver, black or blue. – In terms of screen all APEs showed a common preference for a color and large screen. – Regarding the size/weight, the common preference was related to a small but not too small mobile phone. – In terms of battery life all the APEs preferred a long battery life that lasts at least seven days. – They desired a mobile phone with dual SIM card as it would allow them to hold more

than one network and indeed avoid the network constraints.
- Also the APEs preferred a mobile phone with other essential features such as torch to be used at night, radio and camera; and few mentioned internet.

Available/ preferred mobile phone network operator
While Vodacom was the most preferred mobile phone network due to quality network some APEs and supervisors are using Mcel as this network operator has better quality than Vodacom in their communities. However some respondents stressed that they are using both network providers as in their communities the network coverage limitation is common which is why most participants preferred a mobile phone with dual sim card capacity as it would allow them to hold both network providers.

2.1.1 Use of personal mobile phone for APE activities

All APEs and their supervisors have personal mobile phones that use both for personal communications and APE work. According to the APE respondents they use their personal mobile phones for APE work, via calling or SMS, especially to establish contacts with their health facility to enquire about a specific difficulty related to their work, availability of drugs and a referred patient, or to confirm the date or venue of a scheduled meeting. Also they use them to call fellow APEs mostly to ask for advice on community mobilization or drug management and to contact the community leader Often they call or send SMS to the district supervisor to enquire about drug and essential materials availability, especially RDTs and gloves when they are not available even in the health facility. Also the APEs stated that they use their own phones to call patients or their relatives in the context of follow up and referral to the health facility.

> *"I have mobile phone that I use to call my family, my friends and even my supervisor... mostly I send SMS or call my supervisor to enquire about a specific difficulty related to my work in the community and drug availability at health facility. Also I use it [mobile phone] to call fellow APEs to ask for some advice about community mobilization and to community leader for informing him about upcoming APE activities…. Also I call and receive calls from community members as my number is available for them for purposes of APE work ".* (Participant 3: 28 years old male, APE).

> *"I use my mobile phone to call sick people and caregivers to get information about the patient that I treated... also when there [Health facility] is no drug or RDTs availability I call district supervisor to enquire about when it will be available".* (Participant 7: 29 years old male, APE).

Also the supervisors interviewed stated that they have been using their personal mobile phones for APE work; according to these participants they use their phones to help in the performance of their supervision duties and at least ensure the provision of some support to the APEs as the supervision visits have been irregular due to financial and geographic constraints.

"You know we have been facing many challenges related to financial constraints which do not allow us as supervisors to conduct adequately our supervision duties… so, to overcome this gap I use my own mobile phone and airtime for supervision activities through SMS or calling APEs to enquire about their work in the community or specific information and especially to provide some support when they ask for…". (Participant 6: 23 years old male, SUP).

"Sometimes my APEs used to call me at any time to ask for technical support and drug ordering when there is stock out; mostly they send SMS; if the issue is of crucial importance, when they send a SMS I prefer call them [APEs], as I know that via SMS it is not possible to establish good interaction and call is important to avoid misunderstanding". (Participant 2: 39 years old female, SUP)

2.1.2 Availability of mobile phone

As indicated previously, both APEs and their supervisors have mobile phones. While few participants stated that they used to switch off their mobile phones for power saving purposes especially at night most of the APEs and all the supervisors interviewed said that their personal phones are always switched on i.e. 24 hours a day and seven days a week and always with them. However, some respondents stated that sometimes their phones can be found off due to network coverage limitations; but it was stressed that these coverage limitations varies for some minutes but it never lasts for more than 30 minutes.

"My mobile phone is always on and with me because it belongs to me… and rarely its battery is empty because I know that someone can call me at any time".(Participant 1: 28 years old female, SUP).

"My mobile phone is always with me whenever I go and always with me. But sometimes at night I switched off for power saving purposes; but I use to switch off around 10 pm… if someone calls me before this time will find it on". (Participant 5: 32 years old female, APE).

"My phone is always turned on but because of poor network coverage sometimes I can't receive the network signal; however the network coverage limitation never lasts for more than 30 min… for this reason I advice everyone who have my phone number to try several times if they call but can't establish contact with me". (Participant 4: 41 years old female, APE).

2.1.3 Mobile phone functions Used

Both APEs and their supervisors use their personal mobile phones especially to make and receive calls and write, send and receive SMS in local languages and Portuguese. They also stated that use their mobile phones to retrieve contacts and as calculator, clock and calendar as well. Some respondents used the torch and camera function and a few mentioned internet.

"I use my phone to make calls, send and receive SMS, see time [use o'clock] and perform some calculations [use calculator]... also I listen to news and music [use radio]". (Participant 6: 28 years old male, APE).

"I use my phone to communicate through both calls and SMS in Portuguese and Xitsua [local language]... in general my SMS occupy two pages". (Participant 9: 29 years old male, APE)

"My mobile phone has many functions but I use it mainly for calls, send and receive SMS, calculator and clock… I also use the calendar, camera, torch at night and internet". (Participant 4: 32 years old female, SUP).

2.1.4 Problems/challenges by using mobile phones

Overall, almost all the participants said they don't face any difficulty while using their mobile phones because the typical used functions such as make and receive calls, send and receive SMS, phone book, calculator and calendar are simple and all they did not know about those functions were explained at the time of phone purchasing or during its use they were learning or were taught by friends or their relatives who used the same brand of phone. While most of the APEs stated having no difficulty/problems using mobile phones few reported having difficulty with using some phone functions such as writing SMS and phone book.

"I can say that I have no difficulty with using my phone because I'm used to ... and even other phones I've used I never had problems because they were very simple to use". (Participant 1: 33 years old male, APE).

"Although at the beginning I had trouble with sending and reading messages now I can say for sure that all is ok because I asked a friend to teach me... so I do not have any difficulty in using my mobile phone". (Participant 6: 23 years old male, SUP).

"In my phone I use only the functions of call and receive calls... I still have faced some difficulties with use of phone book and writing and reading SMS...so to solve this difficulty normally I ask my son to help me. But I'm learning and I know I'll overcome it [those faced difficulties]". (Participant 8: 28 years old female, APE).

2.1.5 Access to Charging, Repair and Airtime

- **Charging**

According to the APEs and their supervisors who participated in the study, their phones are recharged using the solar panels chargers and car batteries. The phone charging commonly took place at three locations: in the home, in the neighbor's or relative's home and at the health facility. While almost all the APEs normally used to charge their mobile phones in the

neighbor's or relative's home most of their supervisors charged their phones from the health facilities or homes. Few APEs have their own solar chargers or car batteries for charging purposes. Those that do have solar chargers tend to charge their phones at home.

> *"My phone battery is never empty of charge because I have a solar charge at home...and even many neighbors come to my home for phone charging purposes".* (Respondent 5: 32 years old female, APE).

> *"I use to charge my phone at my neighbors house as he has a car battery...also when I go to the health facility I use to charge my mobile phone as there is electricity".* (Participant 10: 23 years old female, APE).

> *"Rarely my phone battery is out of charge because I have access to electricity during my work here at the health centre and even when I forget to charger here I use to charge it [mobile phone] at home using my solar charger".* (Participant 2: 39 years old female, SUP).

- **Repair**

When asked about phone repairing all the respondents stated that overall they have looked for help from informal technicians in their communities. When the problem with the phone is difficult to solve locally they said that in general they go to Massinga as there are many qualified trading centers. However, some stated that when the problem is minor or typical they have repaired their phones by themselves. For others they have called on personal favors from some local persons who can do the repairing work for free of charge. In general both the APEs and their supervisors have paid for their own phone repairing costs.

> *"When my phone needs repairing, normally I give it to guys who use to deal with this type of work in our community. But if the problem is big I take it to Massinga to someone who can repair it adequately because there are experts". The problem is money because the costs become high as it includes traveling to Massinga".* (Participant 2: 42 years old female, APE).

> *"If my phone has a typical problem with microphone I use to repair it by myself… but when the problem is difficult to solve I take it to someone who knows to get it done.* (Participant 6: 23 years old male, SUP).

> *"When my phone breaks I take it to my friends who repair it for free of charge because sometimes I give them fish and cassava and they know that they have to give me some personal favors…this is life".* (Participant 1: 33 years old male, APE).

- **Airtime**

Despite some constraints related to accessibility (sometimes out of stock or sometimes available a little bit far from their communities) most of the APEs and their supervisors stated that overall airtime is available from small retail shops or dealers in their communities or

nearby; while airtime is little bit expensive especially remote communities than in Massinga, both the APEs and supervisors interviewed stated that in general they get airtime at a personal cost when it is possible. Also these respondents stressed that while they are using their personal phones for APE related activities the government never gave them airtime for this purpose.

> *"Here in our community is possible to buy airtime but not always as sometimes even with money on hand we cannot find airtime anywhere… so we have to walk to other communities some of them are far away from here which takes time…".* (Participant 9: 29 years old male, APE).

> *"Airtime is always available but cannot be got all the time because of lack of money. As mostly I haven't airtime in my mobile phone it would be good if the government provided it for me as I use my phone for APE work… sometimes when an APE call me for any reason I can't call back because of lack of airtime which embarrass me".* (Participant 4: 32 years old female, SUP).

> *"You know here the airtime is a little bit more expensive than in Massinga because of transportation issues or opportunistic reasons of the dealers but as we haven't other choice and indeed we need to communicate when it is possible I buy some airtime…".* (Participant 5: 32 years old female, APE).

2.1.6 Desired Phone Features

According to the APEs and supervisors who participated in this study, they prefer the Nokia brand phones because Nokia brand is common and familiar for them and indeed most suitable to use and carry; in addition they stressed that Nokia phones are desirable as Nokia chargers can be found anywhere and in case of faulty Nokia phones are very easy to repair as for all the available repairers Nokia brand is familiar.

> *"It should be a Nokia phone as they are user friendly and suitable to use and carry. I never faced any problem while using such phone brand".* (Participant 1: 28 years old female, SUP).

> *"… if you forgot to charge it [Nokia phone] everywhere you go you will find a charger,,, anyone can borrow you…even if there is a faulty it is easy to repair as all the repairers have Nokia parts and accessories and indeed it is familiar for them".* (Participant 3: 28 years old male, APE).

It was also possible to find that the APEs and their supervisors nominated the phone color, screen color and inch, size/weight, battery life and number of SIM cards as key features that a phone should have:

- **Color of phone**

While black was the most favourite color mentioned by both APEs and their supervisors some participants stressed that they haven't any specific preference regarding the color of phones; however these respondents indicated that they prefer dark colors such as dark silver, blue and black.

> *"For me my color preference is black phone because I like it… all the phones that I had was black. Also as every time I use to handle the phone even after digging or eating something I think that black color is desirable for dirty hiding reasons".* (Participant 4: 32 years old female, SUP).

> *"I haven't a specific color preference for my phones but I know that for me a phone must be dark silver, blue or black…but in general I like dark colors because I don't like when a phone get dirty and look bad to other people as they can think that I'm not serious with cleaning… even if the people who I used to teach how to keep cleaned their houses see that my phone is dirty they cannot take my advice seriously".* (Participant 6: 28 years old male, APE).

- **Phone display Screen**

Regarding phone display screen both the APEs and their supervisor respondents stated that they prefer a color and large screen in order to differentiate distinct colors and indeed avoid eye problems in future as small screen in terms of inches do not allow a good and easy visualization especially of SMSs.

> *"A phone display screen should be color and have a normal inch as it allows the users to have good visualization of SMSs and avoid misunderstanding of the received message… you know if you phone has a small screen it can be tiring for your eyes and in future it would leads you into a serious eye problem".* (Participant 4: 41 years old female, APE).

- **Phone Size/weight**

In terms of desirable phone weight/size the common preference was related to a light and small but not too small mobile phone.

> *"For me a good phone should be light as I use to walk around the community and indeed I don't want to carry heavy stuffs to negatively contribute on my tiring day-to-day journeys".* (Participant 8: 28 years old female, APE).

> *"A phone should be small in order to fit in my pocket trousers but it cannot be too small".* (Participant 6: 23 years old male, SUP).

- **Battery life**

According to the common preference, it was felt that a phone should have long battery life which lasts for at least of 7 days or more as most of the interviewed participants have no access to electricity and don't have own solar charges meaning that they have to ask for some favor to their neighbors, friends or relatives:

> *"I don't know exactly if it exists or no but I would like to have battery that can lasts for seven days or more because I don't have electricity neither a solar charger in my home… so every time, may be three times or more a week I have to ask for the my neighbor's solar charger which for me it sounds as something boring".* (Participant 7: 29 years old male, APE).

> *"A battery of long life I mean which lasts at least one or two weeks should be better as it would allow me to avoid the charging constraints…you know, I have no a solar charger and when I need to charge my phone I have to walk to my sister's home and wait until the battery's full…".* (Participant 10: 23 years old female, APE).

- **Sim card preference**

Despite some concerns related to high battery consumption and fake brands which is common in Mozambique especially some phone brands made in China, overall almost all the APEs and supervisor respondents preferred dual sim cards phones as it would allow them to hold the two main network providers and thus avoid the network coverage limitations. However, for few participants (2/12 APEs) their preference remained in single sim phones. In contrast this reference was mainly based on lower battery consumption and good network coverage/signal of one mobile phone network provider.

> *"For me despite some battery consumption constraints I prefer a dual sim card phone as it would allow me to hold both Mcel and Vodacom [the two main mobile network providers in Mozambique] and indeed avoid the network constraints…you know with a dual sim phone I don't need to have two phones and indeed everywhere I go I'll no longer face the problems of network signal".* (Participant 1: 28 years old female, SUP).

> *"I prefer a single sim phone as it saves the battery power and in my community there is good Vodacom network coverage… Also I know that those common dual sim phones come from china and indeed are fake brands as normally they don't work for long time".* (Participant 1: 33 years old male, APE).

- **Other preferred features**

Also the APEs and their supervisors interviewed preferred a mobile phone with other essential features such as torch to be used at night, radio, camera/video and memory card; and few mentioned internet (1/6 supervisors).

> *"A good phone should have radio, memory card to store many information and indeed have a camera/video as it would allow me to take some pictures for example of an APE while teaching his community on how to prevent malaria which would be reviewed and discussed latter with the APE for better procedures consolidation".* (Participant 6: 23 years old male, SUP).

"Since we work even at night it should be better to have a phone with torch to avoid eye problems and help me to see the way back home". (Participant 12: 38 years old male, APE).

2.1.7 Network operators used and why

Most of the APEs and their supervisors are using Vodacom (6/12 APEs and 2/6 Supervisors) because according to these participants this mobile network provider have the good quality signal of all networks. Some respondents stated that they are using Mcel (4/12 APEs and 1/6 supervisors) as it has the better quality signal in their communities. However some respondents stressed that they are using the both network providers (2/12 APEs and 3/6 supervisors) as in their communities the network coverage limitations is common; thus when one network operator is providing poor signal they use to shift to another one and vice versa. Overall it was found that both network operators have coverage limitations. It was also mentioned that as the people they contact are divided in terms of network providers they have to be connected to the same provider for airtime saving purposes.

"I use Vodacom because it has better quality signal and bigger coverage. Also many people who I contact are using Vodacom". (Participant 1: 28 years old female, SUP).

"Since I bought my phone m*y network provider is Mcel because it was the first one here in our community and from that day until now it still has the strongest signal than Vodacom in our community...*". (Participant 10: 23 years old female, APE).

"I use either Vodacom or Mcel because here in our community these two signals have facing some limitations. So when Mcel have poor signal quality I immediately shift to Vodacom… also I use to shift from one provider to other to save airtime as when you are connected to the same provider the call costs are low". (Participant 7: 29 years old male, APE).

2.2. Preferences based on phone examples

Relying on the innovative approach related to the introduction of mobile phones in the APE work, the fieldworkers showed the respondents two mobile phones all from Nokia brand (Nokia 2700 and Nokia C3) to elicit further preference about which one of the two is most or least preferred and why.

2.2.1 Phone liked most and why?

Overall as both phones were from Nokia brand all of them were commonly viewed positively by the APEs, supervisors and implementer respondents. The main reasons cited were the acceptability and familiarity with the functioning, good battery life and the easiness for repairing purposes as pointed above. However, when asked to choose which one of the both phones they liked most, almost all the APE participants (10/12 APEs) and all the supervisor

respondents indicated that Nokia C3 was more preferred than Nokia 2700 because it has bigger screen and hold memory card and dual sim cards which, according to them, will be useful to store a lot of information and indeed cover a large number of users and overcome the typical problems of mobile network quality signal/coverage.

> *"Although both are from Nokia brand I prefer this one that hold dual sim cards [Nokia C3] as it would allow me to have many options, especially in case of network coverage problems. So if someone call me when Mcel has a problem he would find me in Vodacom and so on... you know it would allow me to manage the situation without having two mobile phones and indeed reach a lot of users".* (Participant 3: 28 years old male, APE).

Despite some concerns regarding the battery life, other reasons given for liking most the Nokia C3 phone is that it has a color and larger screen display, dark color, torch and is light; It was also stressed that the Nokia C3 is modern and despite less commonly than the other existing phones in their communities their outlets especially the charging one is similar to the existing in other common Nokia phones.

> *"I like the Nokia C3 because it is modern, is light, has a dark color, it holds a torch and their outlets are similar to the existing in other Nokia phones...besides it is possible to be connect to the internet".* (Participant 6: 23 years old male, SUP).

Also it was felt that those participants that liked most the Nokia C3 tended to prefer it due to its larger size than the Nokia 2700 size which was seen as beneficial in terms of the screen being not only easy to read messages also for other displaying purposes such as reviewing uploaded files and recorded videos/photos.

> *"I prefer most this Nokia phone [Nokia C3] because it has a large display screen which is very important for reading purposes as the words and numbers also appear large. It would also allow me to watch larger pictures than in the other one [Nokia 2700]".* (Participant 7: 29 years old male, APE).

2.2.2 Phone liked least and why

The Nokia 2700 was the least preferred phone (only few participants - 2/12 APE participants and no supervisor respondents - liked it). While it was stressed that such Nokia phones are user friendly and have good battery life it was disliked by some participants as they considered tricky to have a single sim card phone due to quality network coverage constraints.

> *"While I have two sim cards one from Mcel and other for Vodacom I have a single sim card phone which is difficult to deal with this situation as when there is poor connection of one of the two providers I have to shift to another one... considering our situation I dislike those single sim card phones as it doesn't help...".* (Participant 5: 25 years old female, SUP).

While some APEs and supervisors interviewed who didn't like the Nokia 2700 pointed reasons related to its display screen size as it was felt as small for reading, calculation and photo/video displaying purposes others stated that as in their community some people have the same type of phone if it could be stolen or lost it would be difficult to find.

> *"I dislike this Nokia phone as its display screen is small which a very big impediment for reading and calculation purposes... also as these Nokia phones are common in our community in case of theft or lost it would be difficult to find it".* (Participant 12: 38 years old male, APE).

Phone most liked: Nokia C3
Phone least liked: Nokia 2700
Suggestions / recommendations: Nokia C3
Key considerations/justifications: holds dual sim cards, user friendly as most of Nokia brand phones, large display screen size, modern and different/not popular so less prone to theft

2.2.3 Single or dual sim phone?

As pointed above it was felt that almost all the APEs and supervisor respondents preferred most a dual sim phone (Nokia C3) than a single sim card phone. Again it was found that one of the main reasons which justify such preference is related to the network connection constraints. As some APEs and supervisors are connected to the Mcel and others to Vodacom It was also felt that a dual sim phone is more preferred as it would be useful for airtime saving purposes i.e. since they would have been connected to the both networks it would allow them to call using the same provider which is less expensive than calling using a different operator service.

> *"Considering the typical poor connection for me it is more preferable to have a dual sim phone as it would allow me to overcome this frequent challenge. In addition, as I know many people some of them are connected to Mcel and others to Vodacom it would be good for saving airtime as I no longer would need to call using a different network provider".*

Despite some concerns related to the familiarity and qualification of the repairers regarding such phones and parts replacement in case of a fault again the preference for the dual sim phone was related to its brand (Nokia), as it was felt as user friendly and indeed reliable. As those dual sim phones are less popular in the communities also it was felt as suitable in terms of prestige.

> *"…most of all it would be very good for improving the APE prestige in the community as in the market these dual sim phones are expensive and therefore few people in the community can afford It….since well trained or familiarized any person can operate any Nokia phone as those Nokia phones are user friendly".* (Participant 11: 46 years old male, APE).

Dual or single sim: almost all prefer a dual sim phone
Suggestions / recommendations: provide dual sim considering poor network challenges and APE prestige in the community
Key discussion points: Is a dual sim phone easy to maintain/repair?

2.2.4 Potential problems using phones

Regarding anticipated problems using the supplied phones some APEs and supervisor participants expressed some concern related to operating issues as such new phones were considered to be modern and felt to be difficult to use it without previous training. In addition it was stressed that no matter which phones are provided first users should be trained as there are different levels of skills in the use of phones which indeed would be fundamental for purposes of effective use.

> *"Despite all Nokia phone are user friendly as this is a new one and not popular for us I think that in order to be easily workable and indeed facilitate our life you [inSCALE] must teach us on how operate it otherwise we will face many problems related to the effective use of such phones which isn't desirable".* (Respondent 4: 41 years old female, APE).

Again it was explicitly felt that almost all the APEs and supervisor respondents were concerned to the existing quality of mobile network coverage as they stressed that in order to introduce mobile phones to the APE work inSCALE should consider such constraint as a key challenge. Again they suggested that in order to overcome such typical challenge and ensure good quality coverage and indeed fulfill the proposed inSCALE objectives for this intervention it is needed to consider a combination of the two main Mozambican network providers (Mcel and Vodacom).

> *"As typically in the remote areas of our district there are some problems of poor network coverage your intervention program [inSCALE] must consider the combination of both Mcel and Vodacom as it would allow all the APEs to overcome such challenges"*. (Participant 6: 23 years old male, SUP).

According to some respondents as new phones (such as Nokia C3 which holds a dual sim cards) are modern they feel that it wastes much more the battery power than the old ones. It was commonly concerned about the challenges related to the phone battery life as in general there is no access to electricity. In fact the main issue related to keeping the phones charged was both having no access to electricity and no solar charger to charge the phone battery; in addition it was stressed the need for providing phones that have batteries that can hold a charge for a long length of time and that such modern phones often wastes much more the battery power as typically they hold may functions. Regarding this concern it is evident that the inSCALE proposed intervention must consider such key issue of charging by providing solar chargers to the APEs and their supervisors.

> *"As most of the APEs haven't access to electricity and even don't own a solar charger I think that if you [inSCALE] are going to provide mobile phones for them you must*

> *consider the charging as a key issue because they have been dealing with many arrangements sometimes embarrassing in order to get their phones charged".* (Participant 3: 23 years old female, SUP).

> *"You know as such phones are modern they hold many functions which works always even if you aren't operate it... so I think that it will be tricky for me to keep them always charged as I haven't a solar charger".* (Participant 2: 42 years old female, APE).

While it was agreed that the supplied phones would be for APE work, a further potential problem was highlighted by APEs and supervisor participants as to whether it would be possible or not to call other people not related to their work especially family, relatives and friends. It was stressed that it may be tricky to deal with some critical situations where for example even having a phone with airtime they wouldn't help some neighbor while usually they have been helping each other.

> *"What about if there is an emergency not related to my work as APE, may I use such phone for calling purposes? If not what are the really advantage of having such phones if it won't be useful for some critical situations?"* (Participant 11: 46 years old male, APE).

> *"You know in our community there is a widespread poverty; even me, I'm poor... so look, if some neighbor has a critical situation such as a case of live or death and come to me asking for help to call what I suppose to do? In our culture it means that I must help him unconditionally because who know tomorrow it would happen to me…"* (Participant 6: 23 years old male, SUP).

While some suggested that it would be motivational to have some chance of calling for free, it was felt that a policy on the use of supplied phones is needed not only to ensure that APEs and supervisor beneficiaries have standard operational procedures for better use and phone conservation purposes but also for dealing with some situations that may cause conflicts not only at home but also at community level (such as those cited above) and at work such as the consequences of loss or theft. It was also stressed that given the nature of their work and conditions in which they normally operate or store their phones and continuous phone use there is a potential risk of damage.

> *"In my opinion I think the best thing you [inSCALE] must do is to allow us to call at least two or three people not related to our work for free which in other hand would act as a kind of non financial motivation".* (Participant 5: 25 years old female, SUP).

> *"What about if I lost the supplied phone or if it was stolen from me? Are you going to arrest me or ask for replacement/payment? I'm wondering because I can't afford it…".* (Participant1: 33 years old male, APE)

> *"Considering the nature of our work there is a possibility of accidentally the phone be damaged… so what would I do in such situation? It would be of my entire responsibility*

to repair or replace the damaged part? Where I'll find money to cover the costs as such phones are expensive?". (Participant 10: 23 years old female, APE).

Besides others felt that as the Nokia C3 slide looks like something fragile it could be easily broken and the replacing and repairing costs should be higher than those required for typical phones; and for that reason it would be hard not only to afford the maintenance/repairing costs also to find a qualified person for repairing purposes in their communities.

"If you [inSCALE] are going to provide this beautiful phone [Nokia C3] you must be careful because I'm concerned about its slide as it seems fragile; in fact my fear is related to the phone maintenance as sometimes our APE work is hard when we start to dig for demonstrating purposes of preventive activities or in the our farms… if you drop it or accidentally you drop it against something solid such as a stone it could be damaged which will be a serious problem not only for replacement purposes also for repair as here[community] we haven't qualified repairers for such phones". (Participant 12: 38 years old male, APE).

Potential problems regarding phone use: challenges relating to familiarity and operating new phones, poor mobile network connection, challenges with charging meaning that there is a need for providing solar chargers, potential conflicts regarding the use of provided phones for situations not related to APE work and some concerns related to phone maintenance/repair and consequences of loss, theft and damage.
Suggestions / recommendations: consider training users in the appropriate use of provided phones, combination of the two main network providers due to network access limitations, provide users with solar chargers and development of a policy/standard operational procedures regarding the use of supplied phones especially in terms of key issues such as who is allowed to use them and in which circumstances, who is responsible for their maintenance and consequences of theft, loss or damage.
Key discussion points: to develop a strategy regarding effective support related to training of users and phone/chargers maintenance may represent a key challenge due to its related costs.

2.2.5 Potential identification of supplied phones

According to all the participants the idea of identification of the supplied phones as APE phones is acceptable and indeed it should be labeled for many reasons and advantages. Overall it was felt that since well identified it would be of crucial importance not only to prevent theft as they are modern phones also to be easier to find them in circumstances of loss or theft.

"For me I think that this idea will be accepted by all the APEs as it would be a good strategy not only to prevent theft also to be easier to be found in case of theft or loss". (Participant 3: 28 years old male, APE).

"… for me it's ok to be easily identified as an APE phone because it cannot be stolen; also if marked, everyone will know that this is an APE phone which will be good for recovery purposes in case of loss". (Participant 5: 32 years old female, APE).

Also it was cited that a potential advantage of marking the phones would be the increasing of their prestige/status in the communities not only because it was commonly felt that such modern phones look very beautiful and expensive also because it would be perceived as a type of recognition of the usefulness of their work in the community.

> *"As those modern phones are beautiful and all the people know that they are expensive it* would increase our status in the community as the people will perceive that we are recognized by the government as people who are doing a useful work in our communities". (Participant 1: 33 years old male, APE).

When asked to suggest how the phone should be marked, overall participants suggested that it is of crucial importance the phone be identifiable both externally and internally in a well visible space. Regarding the external identification it was mostly suggested that it should be put in the back of the phone using a durable and well visible sticker. In terms of internal branding there were two common suggestions: while some proposed that it should be put in the battery, not only to prevent theft or switching by some dishonest repairers, but also to act as a backup marking for recovery purposes, others suggested that the identification should appear on the screen when turned on. Also it was suggested that the chargers should be branded.

> *"I think that the label can be placed on the back of the phone but must be clearly visible and be a sticker that lasts for long time and be hard to remove...".* (Participant 10: 23 years old female, APE).

> *"…also it should be branded inside for example the identification should appear on the screen when we turn on the phone or as a background… in addition I think that it is important that the chargers be labeled too"*. (Participant 4: 32 years old female, SUP).

Phone identification: all respondents unanimously accepted and recommended that phones should be branded not only to prevent from theft or recovery if lost also to increase the APE status in the community
Suggestions/recommendations: it was suggested that phones should be branded both externally and internally. It was suggested that chargers should be branded as well.

2.3 Implications

According to participant feedback regarding phone use it is evident that mobile phones are familiar and indeed acceptable among APEs and their supervisors. Specifically:

1. All APEs and supervisor participants have mobile phones that they use both for personal contacts and APE related work. They are always on and with the APEs. The use of phones for APE work is limited due to the cost of airtime. The proposed closed user group intervention thus meets a need but is not introducing a new tool but rather

enabling a function that has already been identified as valuable. This should be considered when thinking about the added value that inSCALE can expect from providing phones.

2. Supervisors are currently contacted, mainly through SMS, for several reasons including reporting problems, checking on medicine stocks, referring patients and confirming meeting times. Supervisors sometimes follow up with community members through the phone which may reduce transport issues for the APE. These uses should be considered and built on by the intervention designers.

3. Some supervisors felt that using SMS reduced interaction and could lead to misunderstanding. The intervention design team should consider the benefits of encouraging calls rather than SMS to enhance interactions and support.

4. The majority of respondents have no difficulties using phones. APEs and their supervisors mostly make and receive calls and send and receive SMS. SMS are usually in Portuguese but some are in local languages. Although APEs are familiar with phones they will need training or clear instructions on using new functions. inSCALE also needs to consider that all program communications are to take place in Portuguese[4].

5. APEs and supervisors use Vodacom and Mcel with Vodacom being slightly more common. Many alternate between networks depending upon coverage levels. Decisions on network choice are critical as network problems are a common constraint to phone use. The intervention team should base decisions on their network coverage survey and consider the use of a dual sim enabled phone.

6. Phones are charged from car batteries, solar chargers and at the health facility and several APEs need to travel in order to charge their phone. APEs that have solar chargers use them to charge their phones at home. Supplying solar chargers is therefore recommended but is unlikely to be potential money making venture for the APE as none reported paying others to charge their phone.

7. When there is a fault with their phone both the APEs and supervisor respondents first try to repair it locally but if this isn't possible they look for better quality services in Massinga at their own expense. The intervention design team needs to consider repair issues for example by having a central system or place for phone repair/maintenance in Massinga. Some APEs were concerned that they would have to pay for repairs or lost/stolen phones and the intervention team need to make these policies clear.

[4] It is recommended Portuguese language for all programme communications as it is the official language in Mozambique and indeed it is understood by both APEs and supervisors.

8. There was some concern about phones being used for non APE purposes and that conflicts may arise around use with community members expecting to use the phone. inSCALE needs to provide a clear policy on use.

9. Preferences related to phone color were not strong but dark colors were felt to hide dirt. Respondents preferred large color screens for easy reading and to prevent eye problems. They also preferred light and compact phones but not 'too' small. The most important characteristic was a long battery life. There was a tension between wanting functions such as a dual sim, camera and torch and the impact this would have on the battery. If dual sim phones are adopted it is essential that they have long battery life and ensuring good network coverage – at least as good as single sim competitors.

10. Respondents preferred Nokia brand phones due to familiarity and perceived ease of repair. There is a perception that some brands are cheap imitations and less reliable. The Nokia C3 was the preferred model of those shown to participants due to perceived usability and modern look which would increase APE status; however there were concerns about the fragility of the slide function and the battery life. More common models were considered to be hard to trace if stolen. inSCALE should therefore utilize a less common Nokia model phone and consider a modern looking phone that is sturdy and has a long battery life.

11. A phone with a memory card and cameras/videos could be used for APEs and supervisors to record tasks that can be reviewed by the APE or supervisors and discussed at a later date (potentially during supervision visits or APE meetings). It would allow them to check and discuss to which extent the APEs are following the standard procedures and how to effectively overcome the common challenges.

12. There was strong support for internal and external branding of phones to increase community recognition and respect for APEs and also prevent phone theft. It was recommended chargers also be branded.

Section 3: Innovations to increase communications

Summary of key findings on the innovations to increase communication
Impact on interactions between APE and supervisors and fellow APEs and perceived benefits of having free phones **Positive feedback**: supervisors, implementers and APEs stressed that it would enable both APEs and supervisors to communicate frequently and on a regular basis about drug availability and supply, upcoming supervision visits, meetings and trainings as well as other pressing issues. They also stated that it would improve APE and supervisor motivation and performance, save APEs and supervisors money and reducing a sense of isolation as well. **Main potential challenges: n/a** **Positive feedback on specific communication activities and their usefulness, motivational properties and challenges** - It would increase supervision frequency, improve support regarding the management of drug stock and promote the perception among APEs about a sense of belonging to the health system. - Supervisors and APEs felt the intervention had the potential to improve technical quality as well as make APEs feel more supported by the supervisors. - It was stated that it would enable the following up on referred children and feeding back information to the families. - It was stated that this would highlight the value of exchanging experiences and motivational on APEs work. **Potential challenges with innovation to increase communication activities** There were some concerns relating to the potential non resolution of the reported problems and supervisors workload, reduced face to face supervision, difficulties to discuss some complex tasks over the phone, timing of support especially in the context of emergencies, communication among fellow APEs should be limited to mobilization and preventive matters and moderated in order to prevent miscommunication. **Closed user groups** **Positive feedback:** supervisors, implementers and APEs stressed that they will have unlimited call duration meaning enough time for further in depth discussions, and the potential for access to timely support and input from supervisors, fellow APEs and peer support and money saving. **Potential challenges:** it was stressed that they would face problems related to poor mobile network coverage and not being able to call one another.

3.1 Impact on interactions between APE and supervisors and fellow APEs and perceived benefits of having free phones: APE, supervisor and implementer perspectives

Overall, there was a clear and compelling perception among the APE, supervisor and implementer participants that all the initiatives designed to improve their communication and indeed address their motivation, performance and supervision-related concerns are welcome.

> *"This proposed intervention is welcome because it will enable the APEs and supervisors to communicate frequently on matters relating APE work and indeed improve the monitoring of APE work which under the current situation doesn't happen due to financial constraints".* (Participant 3, 52 years old male, IMP).

The importance of providing a free mobile phone to the APEs and their supervisors was widely acknowledged as, according to all APE participants and especially those who work in remote areas, it would enable them not only to be frequently in contact with their supervisors but also to be able to ask for and receive support on a regular basis.

> *"As I live far from the health facility being provided with a phone and call for free would be benefit as it would enable me to frequently be in contact with my supervisor and indeed receive support when needed".* (Participant 2: 42 years old female, APE).

In fact, subjective views captured from in-depth interviews with participants point to the important role of supervisors in providing frequent support and exchanging experiences regarding their day-to-day work especially those relating to general health and preventive activities. Free phones were seen as likely to increase the possibility of such supervision based on need rather than routinely delivered.

> *"I think this idea is good because it will motivate me to work harder because I'll know that when I face a difficulty I'll have possibility to call supervisor immediately... for example if I have a challenge relating diarrhea outbreak, I could call my supervisor for asking an immediate advice and support".* (Participant 1: 33 years old male, APE).

While some of the respondents indicated that this approach would improve APE and supervisor's motivation others stressed that it would improve APE performance as being able to call for free would allow them to call for support at any time meaning an increased likelihood of them delivering appropriate health care. In addition it was indicated by most APE participants that when there are difficulties, especially those related to diagnosing pneumonia in little babies and malaria when there is RDT stock out, the provided phones would enable them to call supervisors for further explanations regarding appropriate diagnosis and timely support.

> *"Since we have phones and airtime [meaning the provided phones and possibility of calling for free trough caller user groups] it would be useful as it would enable us to call supervisor for timely support mainly those related to diagnosing pneumonia in little babies and malaria when there is no RDT".* (Participant 4: 41 years old female, APE).

Regarding the purpose of improving contacts between the APEs and their supervisors it was also explicitly perceived by most of the respondents that as there is a gap relating the frequency of such contacts this approach is a timely opportunity to allow them to close such gap.

> *"While performing my work as APE supervisor I can feel that there is a gap relating my communication with the APEs under my responsibility [APEs under his supervision]… therefore I think that by providing phones this proposed intervention has a great potential not only to improve our communication also to improve the APE motivation as it would enable them to call me when needed".* (Participant 4: 32 years old female, SUP).

It was also felt that as there is a gap relating to regular communication between the APEs and their supervisors, such communication occurs to a certain level through their own phones and airtime. Overall the APE participants cited five common reasons for calling supervisors, these were: asking for advice, discussing issues relating day-to-day challenges and in particular community mobilization, enquiring about drug availability and supply, referrals, upcoming supervision visits, meetings and trainings.

> *"…being able to call for free will allow me to call supervisor in order to enquire for example if a referral patient went to the health facility or receive feedback on the referral; also it would enable me to call supervisor to enquire about upcoming APE meetings".* (Respondent 09: 29 years old male, APE).

It was also thought that as for improving communication purposes the APE participants perceived that having a phone and being able to call supervisors for free would be of crucial importance to save money and indeed to overcome some challenges relating to call costs as usually they cannot afford it. In addition, it was felt that calling supervisors, especially those who are connected to a different network provider, is costly. As illustrated in the statement below, one APE respondent stated that airtime for calling his supervisor who is connected to a different network service operator monthly and fellow APEs can be around half of the APE subsidy.

> *"When it is possible to have some airtime I call my supervisor to enquire for some information mainly drug availability and supply and some specific advices relating my day-to-day work. But given my poor financial status call supervisor regularly is costly as he uses a different network service operator… In my opinion it would be needed at least Mt 600 monthly to cover the call costs relating the APE work"*. (Participant 10: 23 years old female, APE).

Closed user groups enabling greater levels of communication between APEs was viewed positively both because they were considered likely to promote discussions around APE related work which would be useful for improving their performance but also as frequent exchange of experiences could potentially prevent some feelings of isolation.

> *"With this initiative even the APE who lives in remote places will have more opportunities to interact with fellow APEs which would enable them to exchange more experiences and indeed feel less isolated."* (Participant 2: 29 years old male, IMP).

Besides it was stressed by all the participants that providing phones and closed user group benefits both for APEs and their supervisors would enable them to have many more discussions through the phone resulting in less need for face-to-face supervision which currently have been irregular due to challenges relating to transportation and mobility around the communities.

> *"Considering that our supervision isn't regular I think that such phones will be important for us as it would enable us to interact much more with our supervisors without having to wait for him to come visit us in the community...".* (Participant 12: 38 years old male, APE).

According to the supervisor and implementer perceptions, introducing mobile phones to APEs would be fundamental for supervision purposes as it would enable them to closely monitor and support APE work. It was felt APEs need a permanent technical support.

> *"You know as the APEs are less educated people they need a continuous technical support which will be ensured using such proposed mobile phones, because we'll be able to communicate frequently with them and provide supervision on a regular basis...for example we could use such phones to assess how they performed a specific task and discuss many related issues regarding performance improvement".* (Participant 5: 25 years old female, SUP).

With regard to supervision improvement through provided phones, some interesting views were expressed by supervisors and implementer respondents. Similar to APE participants, this group of respondents had a positive outlook regarding phone use feeling it had the potential to facilitate more effective supervision but also to reduce the need to face-to-face supervision and indeed overcome challenges relating to transportation.

> "*We know that in the health component it is important to deliver good quality health care which beside other factors it is assured by effective supervision... unfortunately due to financial constraints we cannot provide an adequate supervision to the APEs; therefore I see this opportunity as fundamental to ensure an effective follow up of APE work*". (Participant 4: 30 years old male, IMP).

As for effective implementation of the proposed intervention the majority of participants suggested that it would be desirable to provide phones for both APEs and their supervisors. For motivation purposes it was also suggested that some non financial incentives such as being able to call some relatives for free, phone cover, umbrella, key chain, water bag, etc, also be supplied which in combination with the provided phones were seen as an incentive package.

> *"For effective intervention it would be important to provide phones for both APEs and supervisors as it would prevent some challenges relating phone availability for establishing regular communication".* (Participant 5: 25 years old female, SUP).

> *"Besides phone providing I suggest that it would be better to provide some non financial incentives such as airtime to enable them to call some relatives, phone cover, umbrella,*

key chain and water bag as well… for better motivation results it would better to combine such incentives as it would be felt as an package of incentives". (Participant 1: 26 years old male, IMP).

Perceived benefits of having free phones: it was widely acknowledged that being provided with phones would be of crucial importance as it would enable both APEs and their supervisors to communicate frequently and on a regular basis about drug availability and supply, upcoming supervision visits, meetings and trainings as well as other pressing issues. They were also felt likely to improve APE and supervisor motivation and performance, save APEs and supervisors money by addressing challenges related to call costs, improve supervision by enabling supervisors to assess the APE performance on a regular basis and potentially reduce the need for face-to-face supervision. APEs peer support was also viewed as technically valuable and also for reducing a sense of isolation.
Suggestions / recommendations: Provide phones for both APEs and their supervisors. Regarding motivation purposes it was suggested some non financial incentives be provided such as being able to call some relatives for free, a phone cover, umbrella, key chain and water bag. Clearly closed user groups address a need – the key will be to determine the user list and managing expectations.
Key discussion points: Is this proposed intervention going to be combined with some non financial incentives? What and for how long will it be maintained as it can be costly? How the need to reduce the face-to-face supervision can be perceived by some supervisors as it acts as a source of income/one way of improving their income[5]?

3.2 Feedback on specific communication activities and their usefulness, motivational properties and challenges

Activity A: Someone from the facility calling to see how you are and to ask if you have any problems

- **Useful?**

When asked about what aspects could make this approach useful, the participants stressed that it would close the gap regarding regular contacts and follow up APE work. It was also recognized that it would enable not only the supervisors but also the health workers who have been to a certain level involved with the APE work to be aware and actively involved in the feedback and solution of APE challenges.

"My supervisor or other health worker being able to call me at any time to ask about my challenges would be of crucial importance as it would allows them to be aware of my situation and give me the necessary support". (Participant 1: 33 years old male, APE).

[5] It could rise some supervisor's concern regarding reduction of the amount of the monthly allowance as result of reduction of the face to face supervision visits because some supervisors used to save some money of supervision visit's daily allowance which at the end of the day helps to a certain level in increasing their personal income.

It was also felt as useful for some supervisor and implementer participants as it would enable them to closely monitoring the APE work especially those activities relating to diagnosing diseases as it has consequences on drug management and indeed drug stock outs.

> *"This intervention is welcome as it will enable the supervisors to closely monitor the APEs work especially relating to diagnosing because I feel that it has been related to the recurrent drug stock out among the APEs... you know if there is a difficult relating diagnosing it is impossible to manage the kit of medicines for one month.* (Participant 3: 52 years old male, IMP).

- **Least useful?**

Not applicable as it was unanimously felt as needed.

- **Most motivational and why?**

Regarding motivational issues it was suggested by all participants that being able to call or receive calls from someone from health facility would be felt as a means of improving their motivation to work because the APEs would perceive it that while facing some challenges their supervisors and health workers are both aware of them and working to solve them.

> *"Someone from health facility for example the pharmacist call me to know about drug availability will encourage me to keep working as I'll know that if there is drug stock out the pharmacist will be aware and support me to overcome such challenge".* (Participant 6: 28 years old male, APE).

It was also stressed that for APEs this intervention would be felt as recognized by health workers and not abandoned by the health facility as well.

> *"It will make me feeling recognized by health workers as a person who is doing the same work... it will also make me feel as closely monitored by the health facility who is responsible for providing me the necessary support*". (Participant 10: 23 years old female, APE).

- **Least motivational and why?**

While some participants felt that this activity would be least motivating if the problems reported weren't solved meaning that when called the APE could mention the same problems, becoming repetitive which at the end of the day would be boring and frustrating. Others were concerned regarding the potential for reduction of supervision visits as it would consequently reduce not only the APE monitoring *via* observation on site but also the APE status in their community because when the health workers come to their communities for face-to-face supervision the community members perceive that the APEs are important and indeed recognized by the MOH.

> *"For me this intervention will be de-motivating if the reported problems aren't solved which means that when called by someone from the health centre the APE could*

mention the same problems; you know it would make them feel that even reporting the problems won't be solved..." (Participant 1: 28 years old female, SUP).

"I like to be visited by the health workers because it not only allows me to exchange experiences and improve my performance also because the community recognize that I'm a son of the ministry of health meaning be respected as a health worker; so I'm wondering whether the phone call from the health centre could reduce such visits...". (Participant 3: 28 years old male, APE).

- **Problems or challenges**

Relating to this activity it was commonly suggested that as it would become regular some APEs may not have any issues or problems to report, meaning it would become less interesting to both APEs and health workers.

Again the supposed reduction of the face-to-face visits due to regular callings from the health centre was felt as a potential de-motivating factor for reasons described above.

Some participants raised concerns related to supervisor workload and other tasks in the health facility as it not only could negatively influence the timing, regularity and effective follow up of the previously reported problems but also because it was felt as an inhibiting factor for an effective commitment and engagement on solving the APE problems.

"As we have other tasks in the health centre and sometimes we face high workload I think that it would negatively influence my engagement in better follow up the reported problems and articulate all the necessary means for timely and effective problem solution". (Participant 01: 28 years old female, SUP).

Activity A – summary
Positive feedback: it was felt that supervision encounters may be more frequent which was in general terms viewed positively but more specifically it was felt likely to assist in such aspects as drug stock management. It was also considered likely to promote the perception among APEs that their supervisors are supporting them and that they are connected to the health system which recognises them.
Potential challenges: while felt as useful there were some concerns relating to the potential non resolution of the reported problems and supervisors workload in the health centre as well the negative consequences of reduced face to face, community based supervision. These consequences were considered to be less observation opportunities and hence real understanding of APE challenges and reduced status in the community for APEs as visits from the health facility lend legitimacy.
Suggestions / recommendations: develop a plan regarding resource mobilization and coordination for timely solution of the reported problems; provide better planning of the supervisors occupation in the health centre for better follow up and engagement on the solution of the reported problems; develop a policy regarding call schedule, timing, content, coordination and responsibilities among the health workers who work directly with the APEs.

Activity B: Someone from the health facility calling to see how you carry out a specific task (e.g. use a Rapid Diagnostic Test [RDT] or engage effectively with the community) and suggesting ways you could improve the task.

- **Useful?**

Since it was felt that the APEs are not professionally trained health workers and are dealing with a sensitive issue this activity was seen as useful as it would ensure regular monitoring of APE work and good quality delivery of health care.

> *"By enabling us to call APEs regularly it will means much more contacts with them and indeed provision of a regular and effective checking of their work in the communities".* (Participant 1: 26 years old male, IMP).

> *"As the APEs are not professionally trained as health workers like as and deal with people lives which must be managed carefully I think that this intervention will be of crucial importance as it would allow us to permanently monitor the APE performance and ultimately ensure good quality of health care".* (Participant 5: 25 years old female, SUP).

> *"If my supervisor calls me to assess and discuss about how I've diagnosed malaria in the child last seen when I haven't RDT, it will enable me not only to correct practices not related to malaria diagnose and treatment standards also to prevent future faults".* (Participant 4: 41 years old female, APE).

- **Not useful?**

Some implementers felt it wouldn't be useful as there is some specific technical support that can't be provided over the phone. For example, as the APEs are not professionally trained health workers it was stressed that they could face some challenges relating to appropriate diagnosis of pneumonia when there are no timers and malaria when there is no RDT meaning that the only one effective way of providing better support is face to face teaching and observation.

> *"When there is RDT any APE can easily diagnose malaria as they were trained for that but when there is no RDT it becomes difficult as overall there are many symptoms which can easily be confounded with malaria... You know, as the APEs didn't received the same professional train when compared to a clinician I'm wonder as I can't see how a supervisor could easily advice an APE through phone because even for me it is difficult to diagnose without see the reality*". (Participant 4: 30 years old male, IMP).

- **Motivational?**

Overall this activity was seen as motivational because it would improve the APE's confidence as they could feel as permanently supported by their supervisors and monitored for ensuring diagnosing and treatment standards.

"I think it will be motivational as the APEs will feel more confident because they will know that are performing according to the supervisor's advice". (Participant 4: 32 years old female, SUP).

- **Not motivational?**

Not applicable

- **Problems or challenges**

Considering the nature of the health tasks and the APE's skills it was felt that it would be difficult to provide effective advice over the phone as it would be challenging for supervisors to effectively explain complex tasks and also represent a risk of misinterpretation by APEs.

"As supervisor I feel it would be difficult to explain through phone some specific tasks for the APEs; for example it is difficult to explain about how to diagnose pneumonia in children when there are no timers...". (Participant 2: 39 years old female, SUP).

"As we weren't trained as professional health workers I think that some complex tasks when explained over a call phones may lead to a sort of interpretations which isn't desired due to the sensitive nature of our work". (Participant 5: 32 years old female, APE).

Activity B – summary
Positive feedback: some participants felt the intervention had the potential to improve technical quality as well as make APEs feel more supported..
Potential challenges: while seen as useful and motivational due to a perception of support and connectedness to the health system there were some concerns suggested relating to the feasibility of such activity. It was felt that it would be challenging to discuss some complex tasks over the phone because it could lead to a risk of misinterpretation.
Suggestions / recommendations: While some simple tasks could potentially be discussed over a call it seems to be crucial that this activity is combined with a face to face supervision encounter so further discussions can be held to clarify and reinforce details relating to complex tasks. Also there is a need to develop a policy and plan for effective support on this subject matter considering key issues such as who will deliver, when and how such support can be provided in order to prevent misinterpretation among APEs.
Key discussion points: how technical support relating to complex tasks can be effectively discussed during a call in a way that is understood by APEs sufficiently for them to apply this knowledge in appropriate practice.

Activity C: APEs being able to call someone at the facility when they have a problem or to say they have referred a child

- **Useful?**

As previously noted in the 'section 2', all the APE, supervisor and implementer participants agreed that being able to call supervisors at any time in order to be supported regarding specific challenges would be useful for improving APE performance and motivation.

> *"Being able to cal my supervisor when there is an emergency is of crucial importance as it will enable me to timely solve the problem and indeed delivery good quality health care".* (Participant 7: 29 years old male, APE).

Considering geographic barriers and supervision challenges this activity was also felt to be important because would enable the APE to receive timely support.

> *"This activity will enable the APEs to ask for technical advice when needed meaning being able to perform accordingly and timely instead of wait for the next contact/supervision visit which themselves don't know when it will happen".* (Participant 4: 30 years old male, IMP).

While mainly seen as an important supporting tool for preventing malpractice when facing some challenge/problems it was also felt that being able to call one's supervisor at any time would be of crucial importance not only for improving frequency of contact between APEs and supervisors but also for receiving feedback in the context of referred children. Such feedback could be relayed to the family of the child and improve the level of respect for the APE in the community as well.

> *"...also enabling us to call supervisors when needed will help us to improve our contacts and for example to know much more about a referred child in terms of health status, treatment provided and patient discharge; this would allow me to inform the child's family in the community; besides it will improve my respect among the community members".* (Respondent 04: 41 years old female, APE).

- **Not useful?**

Not applicable

- **Motivational?**

Considering the benefit of calling at any time, and especially in the context of emergencies, was commonly felt to be motivational as is it would enable the APEs not only to become more confident but also to be aware that in case of any challenges or problems they could call for immediate support.

"For me it will be motivational as I'll know that when there is a problem I'll call supervisor for immediate advice. Even after advice I'll feel more confident and motivated as I'll know that I'm performing according to the standard". (Participant 9: 29 years old male, APE).

- **Not motivational?**

The risk was identified by some APEs that if they were to call their supervisor and not be answered or were to be given confusing advice this could be de-motivating as it would be felt to be unhelpful or a waste of time.

"If I call my supervisor when there is an emergency and she don't answer and even don't call back to know what I wanted could de-motivate me". (Participant 8: 28 years old female, APE).

"For me if there is a persisting problem not related to my misunderstanding but due to supervisor fault even after call her and being advised it would be felt as de-motivational and waste of time". (Respondent 12: 38 years old male, APE).

- **Problems or challenges**

Among the supervisor and implementer group there was a common concern relating to the consequences of the timing of support, as while some problems are complex and take time to solve others do not fall under the health facility's responsibility meaning that the APEs could feel that there is a lack of will or no commitment to solve such problems in a timely manner. An example of such an issue would be drug stock outs.

"Being able to call and aware that can ask for any support at any time would lead to a frustration among the APEs if the reported problem weren't timely solved or not solved at all as they could feel that there aren't desire to solve such problems... you know, some problems takes time to be solved and others such as drug and commodities availability frequently aren't under our responsibility". (Participant 5: 25 years old female, SUP).

Activity C – summary
Positive feedback: across respondent groups there was a positive general response to this intervention especially in terms of APEs receiving support with challenges and growing in confidence as a result and addressing the challenge of providing support to APEs in geographically hard to reach communities. The positive potential of following up on referred children and feeding back information to the family was also identified.
Potential challenges: while it was commonly felt to be useful and motivational some concerns were raised relating the timing of support especially in the context of emergencies. If it wasn't appropriate and timely and if it did not make sense to APEs then there could be confusion and loss of confidence. The possibility was raised by supervisors and implementers that some issues may be complex and take time while others still may be beyond the control of health facility based staff (e.g. drug stock outs). Managing APE expectations in this context is therefore critical.
Suggestions / recommendations: expectations of what support can reasonably be provided to the APEs need to be considered from both APE and health facility side. Defining responsiveness relating

to by whom and how to effectively provide APE support from the health facility side would be beneficial.
Key discussion points: how can health facilities best communicate what they can and cannot do relating to APE support in order to prevent negative feelings and loss of APE confidence related to a perceived lack of will to provide effective support?

Activity D: APEs being able to call another APE and / or peer supervisor

- **Useful?**

Overall it was seen as a good initiative by all the participants because it would enable them to be permanently in contact in order to exchange experiences especially relating to community mobilisation and preventive strategies.

> *"For me this activity will be useful for the APEs because it will enable them to exchange experience relating best community mobilization and preventive strategies as they have been working in the same context".* (Participant 6: 23 years old male, SUP).

It was also felt of as interesting to the supervisors as it could be not only motivating but also of crucial importance for sharing the best lessons learned while performing APE supervision.

> *"It will be useful as would enable me to call a fellow supervisor and get some advice from him relating best way of conduct APE supervision even considering the current supervision constraints"*. (Participant 1: 28 years old female, SUP).

It was interesting that there weren't any participants who revealed some resistance regarding the peer support based activities.

- **Not useful?**

Not applicable

- **Motivational?**

While for some participants it was seen that being able to call fellow to discuss common challenges is motivating others felt this activity as an alternative source of support and a means of solving some challenges based on the working context of APEs and day-to-day experience.

> *"This activity would motivate me because it would enable me to call fellow APE for sharing or challenges and indeed exchanging best experiences relating community mobilization and preventive activities".* (Respondent 11: 46 years old male, APE).

- **Not motivational?**

Not applicable

- **Problems or challenges**

Considering that the APEs aren't trained as professional health workers again there were some concerns among some supervisors relating the content of the contacts between fellow APEs and even some supervisors suggested that such contacts should be facilitated by a moderator especially APE supervisor in order to prevent miscommunication and ensure the standard practices relating preventive activities

> *"As the APEs haven't professional skills like us [supervisors] I think that the content of their communication should be limited only to mobilization and some preventive subject matters... even such subject matters should be moderated by a supervisor in order to ensure that all are correct and in line with preventive tasks".* (Participant 3: 23 years old female, SUP).

Activity D – summary
Positive feedback: all respondents supported the concept of peer support in principle and saw the value of exchanging experiences. Supervisors saw the value of a supervisor to supervisor peer support mechanism. Just being in touch was seen as motivational but the ability to share lessons relating to context specific challenges was seen as key.
Potential challenges: It was argued by some supervisors that communication among fellow APEs should be limited to mobilization and preventive matters and moderated in order to prevent miscommunication and ensure the standard practices relating preventive activities
Suggestions / recommendations: There is a need to develop a strategy to strengthen peer support especially regarding effective use and how to explore the advantage of being included in the peer support group through training.
Key discussion points: whether and if so how APE communication should be limited and moderated without inhibiting such communication? It could potentially be through a call before and after discussing among fellow APEs? If so, who should be responsible for each part of the process? Would it be preferable to simply allow APEs to communicate without moderation?

3.3 Feedback on Closed user Groups: APE and Supervisor perspectives

- **Awareness and Access**

With regard to awareness and access to a closed service operator user group it was found that all the APE and supervisor participants are aware of it and even some stressed that have used such services. As for reinforcing their statements there were given some examples of existing closed user groups in Mozambique such as '10 amigos' from MCEL and 'Bradas' from Vodacom which can be easily accessed by buying airtime of Mt 600 from Mcel and Mt 500 from Vodacom.

> *"I know what is a closed user group as there is '10 amigos' from Mcel... even I am using the advantages of such services as since I charge my phone whit an airtime of Mt 600 it allows me to call for free for my 10 friends for at least 1 month..."* (Participant 3: 23 years old female, SUP).

- **Usefulness**

When asked about the potential usefulness of such closed user groups for APE work, all participants agreed that it would be very useful as it would allow them not only to increase communication between themselves, their supervisors and peers but also potentially close the gap regarding timely support given that it could be provided over the phone. It would also prevent them from spending their own money on airtime to call for APE related work.

> *"Of course it would be a very useful service as it would increase our contacts with our supervisors and indeed facilitate timely support over a call".* (Participant 4: 33 years old male, APE).

> *"I think everyone will accept this service as it will enable us to call without having to pay for airtime... you know call is costly mainly when it is for a government work...".* (Participant 5: 25 years old female, SUP).

- **Advantages of using closed user groups**

Overall it was felt that both APEs and supervisors being able to communicate for free, at any time and indeed without limitation would be of crucial importance for APE work as it would be beneficial not only in terms of call duration, also in relation to time saving (meaning that technical support could be provided timely) and money saving (meaning no need to buy airtime).

> *"Since provided with this service it will be important as it will allow me to call my supervisor and receive timely support on the required advice".* (Participant 3: 28 years old male, APE).

> *"Being able to call for free and without any time limitation will be beneficial as I'll have enough time for depth discussions with APEs... but at all it will enable me to save money as there won't be necessary to buy airtime to be used in the APE related work".* (Participant 2: 39 years old female, SUP).

- **Disadvantages of using closed user group**

Some participants stressed that as it is a closed user group there it has a limited number of users. It was also felt to be potentially frustrating that users can only call people regarding APE work as they have some relatives which could be included as well. It was also suggested that it may be challenging to communicate to relatives using airtime when for work you are able to call for free.

> *"As the name suggests it is a closed user group which means that its benefit is circumscribed to a limited number of users... so when you need to call someone outside the group it will be frustrating as you will need to buy airtime".* (Participant 5: 25 years old female, SUP).

Again it was felt that as there is some limitation regarding mobile network connections, being able to call through one service operator may be challenging as in some places its' network signal may be poor. Not surprisingly it was suggested to consider the combination of the both main network providers.

- **User's inclusion**

Regarding who should be included in the closed user groups, the participants commonly nominated the APEs, supervisors based at health facility, district supervisor, provincial supervisor, health workers who have been involved in the APE related work such as district medical chiefs, pharmacists and biostatisticians and community leaders as well.

> *"For me the important thing is being included all the people who are directly related to the APE work. However as it is a limited group I think should be included the APEs, supervisors based at health facility, district supervisor, provincial supervisor as well as key health workers such as district medical chiefs, pharmacists and biostatisticians".* (Participant 1: 28 years old female, SUP).

> *"...if the idea is to establish good communication between those working with the APEs, in my opinion the community leaders should be included as well".* (Participant 5: 32 years old female, APE).

As for motivating purposes it was also suggested that if there is some space it would be better to include one or two APE relatives.

> *"It would also be good to include one or two APE relatives* as it would *increase our motivation...* it could be seen as motivating because *we* could *feel as beside our work, our benefit also include our family related issues*". (Participant 4: 41 years old female, APE).

- **Who should initiate the contact**

Regarding who should initiate the contacts in such groups, overall all the APEs were unanimous in stating that it should be initiated by any user at any time and when needed. While similarly to the APEs view some supervisors pointed that the contact should be initiated by any member since it is needed, others stated that it would be better to be initiated by the district supervisor because is the one who knows very well the APE program at district level and others stressed that it should be left to the criteria of the group members (beneficiaries).

> *"For me it should be initiated by any member at any time because the challenges have been happened at any time"*. (Participant 3: 28 years old male, APE).

> *"In my point of view any group member should initiate the contact since needed. For example, in the context of an emergency if any APE has one problem to report he cannot wait until someone contact him... it would be a paradox".* (Participant 2: 39 years old female, SUP).

> *"It would be better to be the district supervisor who initiate the contact because at the district level he is the person who knows best the APE program and have been coordinating it".* (Participant 1: 28 years old female, SUP).

- **Supervisor's role**

With respect to the supervisor's role in the closed user group, it was stated by both APE and supervisor participants that supervisors should be the one who incentivises and promotes the contacts by actively pushing the group members to discuss day-to-day challenges, share experiences and indeed increase the communication among the group members as well as giving all necessary support to the APEs in order to ensure not only an effective interaction but also to ensure effective use of the advantages of being included in such a group.

> *"We as supervisors based at health facility have the role to incentive the contacts and provide all the necessary support for effective contact among the group".* (Participant 4: 32 years old female, SUP).

> *"As our supervisors have been working closely to us they should be the people who promote the discussions and incentive us to be actively engaged in sharing our challenges and experiences over calls".* (Participant 11: 46 years old male, APE)

- **Who should moderate the contacts**

When asked about who should be responsible to moderate the contacts in the group, while some participants stated that it should be the district supervisor as he is the coordinator of all the APE activities at district level, others stressed that it should be left to the criteria of the group members as among the health facility supervisors there are some people who have experience relating APE work and are active and talkative.

> *"I think that the district coordinator should be the person who has to moderate the contacts as he is aware of all the APE activities in the district".* (Participant 6: 28 years old male, APE).

> *"It is important that a group has a person who guides the others, but in my opinion I think that should be desirable to leave the group members to choose who they prefer to be the moderator as we have many supervisors who are active and talkative people".* (Participant 5: 25 years old female, SUP).

Summary – closed user groups
Positive feedback: participants were aware of closed user groups and saw the benefits in terms of: unlimited call duration meaning enough time for further in depth discussions, and the potential for access to timely support and input from supervisors, fellow APEs and peer support and money saving.
Potential challenges: poor mobile network coverage and not being able to call relatives were cited as some potential challenges. Participants generally felt that all involved in APE work should be included in the group including community leaders and district supervisors. Managing expectations about inclusion given it is likely to be a smaller group than this is important.
Suggestions / recommendations: develop a policy on effective establishment and use of closed user groups with a particular emphasis on sensitising with regard to whom is to be included. Provide beneficiaries with the means for explaining to their relatives about phone use and limitation of closed user group benefits. Combine the two main network service operators as network coverage is limited in some areas.
Key discussion points: who should be included in closed user groups and how best can the intervention - and especially what it does and does not include - be communicated to all key parties?

3.4 Implications

Impact on interactions between APE and supervisors and fellow APEs and perceived benefits of having free phones

1. Facilitating greater communication between supervisors and APEs and the potential for supplied phones to facilitate this was supported by supervisors, APEs and implementers. There was general enthusiasm for being supplied with free phones but frequently expectations appeared raised in terms of the scope of the communication and the types of equipment that are to be supplied. inSCALE should ensure the purpose of all supplies is understood and expectations are managed.

Activity A

2. inSCALE will need to ensure supervisors can appropriately manage the volume and type of APE communication they receive to ensure their degree of responsiveness is both manageable for supervisors and acceptable to APEs.

3. inSCALE should take steps to address the potential for less supervisor understanding of APEs issues and reduced APEs status should face to face supervision – perceived as validating of the APEs role by the community - decrease as a result of the intervention.

Activity B

4. That supervisors will be able to adequately convey solutions to technical challenges over the phone was a common concern. inSCALE therefore need a specific strategy for addressing complex problems remotely to promote the possibility of intervention effectiveness and faith in the approach.

Activity C

5. inSCALE need to consider how health facilities can communicate what they can and cannot do relating to APE support in order to prevent negative feelings and loss of APE confidence due to a perceived lack of will to provide effective support. While some challenges may be within health facilities' capacity to address they may not have time or capacity to address others. The concern was raised that APEs may not always understand when this is the case with negative consequences for their perception of their support and connectedness to the health system. APEs expectations around what can feasibly happen in response to reported problems therefore needs to be managed.

Activity D

6. While the positive benefits of APEs to APE as well as supervisor to supervisor peer support were recognised, in the context of APEs peer support there were some concerns raised of how to control the quality of the technical advice provided. inSCALE need to consider whether, if at all, they will seek to moderate the content or influence the number of peer interactions and if so how this is likely to impact on how the communication channel will be utilised.

Feedback on closed user groups (CUGs)

7. inSCALE will need to consider not only who should be included in CUGs but how best the intervention can be communicated to all key parties. Respondents commonly suggested that all involved in APEs work should be included in CUGs and often family so all can benefit from the free calls to provide both professional and personal support. Establishing a policy on effective establishment and use of CUGs with a particular emphasis on sensitising with regard to who is to be included is therefore necessary. Providing beneficiaries with the means for explaining to their relatives about appropriate use and limitations of supplied phones for CUGs and any other purposes would seemingly assist with effective introduction of the intervention.

8. The feasibility of the network providers to support CUGs should be thoroughly explored as concerns were commonly raised regarding the adequacy of phone reception should the intervention not utilise both of the main network providers.

Section 4: Innovations related to data submission and use

Summary of key findings on the innovations related to data submission and use
Most useful kind of response to submitted data **Positive feedback:** it was felt that personalised messages, vote of thanks and constructive feedback would be appreciated and indeed motivational **Main potential challenges:** it was cited that automated messages, non personalized responses and non constructive feedback would be de-motivating **Electronic data submission and response to APEs** **Positive feedback:** it was seen as beneficial for time and money saving, improving the APE motivation and flexible in submission timing. **Main potential challenges:** it is needed skills to handle this technology and data quality assurance as well; it was also cited that some limitation relating poor network coverage and the amount of current indicators that APEs collect would be challenging. **Data would like access to – implementers** **Positive feedback:** it was felt that implementers would need to have access to the full range of the data collected by the APE in order to have a whole picture of the APE work **Main potential challenges:** n/a **Data supervisors and implementers believe supervisors should have access to** **Positive feedback:** both supervisors and implementers stressed that it would be useful to have access to the full range of the indicators in order to be aware and informed regarding the performance of the APEs meaning having the whole picture on the APE work for an effective supervision. **Main potential challenges:** n/a **How should data be accessed – supervisors** **Positive feedback:** it should be through phone because it would be easy to access meaning at any time and everywhere as well as provide timely feedback. **Main potential challenges:** n/a **Positive feedback on the specific activity innovations related to data submission and use** - *Activity A*: it would positively influence the APE behaviours in order to be much more motivated to perform the submission task as expected and ensuring good quality data as well. - *Activity B: i*t would enable the APEs to have an evidence of what they have done since they started work as well as make a self-assessment on their performance. - *Activity C:* it would enable the APEs to be aware of their strengths and weakness meaning be able to prevent mistakes. This should be done in respectful and constructiveness tone. - *Activity D:* it would help the supervisors to anticipate preparation for supervision meetings as well as enable the APE program to effectively channel the supervision resources for where it is needed which ultimately would positively influence in the establishment of a regular supervision.

- *Activity E:* it would provide an accessible and flexible job aid, increases motivation and promote better APE performance as well.
- *Activity F:* it would help supervisor to plan and anticipate preparation for effective support.

Potential challenges
Overall, there were some concerns expressed relating to complexity of each disease, time consuming related to reading and understanding the treatment guide, potential sort of misinterpretations. It was also felt that automatic responses not related to what was submitted would be de-motivating; the fear for being dismissed due to bad performance and poor network connectivity were also reported as potential concern.

Positive feedback on monthly motivational text messages
Regarding the most motivational kind of text messages it was felt that messages with recognizing and encouraging content, vote of thanks as well as personalized with each APE name acknowledging the importance and positives of their work in the community were appreciated and valued.

Main potential challenges
There was a common concern that if the message comes from who isn't really known by the APEs it would lead to a miscommunication and indeed resulting in the usefulness of such intervention.

Suggestions/recommendations
It was suggested that such messages should be formal and polite in order to ensure seriousness and respectful. It was also recommended that such messages should be simple, clear, objective and not too long.

4.1 Most useful kind of response to submitted data

Regarding feedback on submitted data it was commonly cited across APE participants that all personalized responses combined with a vote of thanks would be valued because it would indicate that APEs are respected as professionals and human being. In addition APE respondents expressed their desire to receive feedback relating to suggestions on how to correct or improve data collection and complete the summary forms in order to prevent future errors as well as provide effective support for effective performance. It was stressed that feedback should be constructive.

> *"The feedback relating submitted data not only should evidence that the data has been delivered also the response should be personalized with a vote of thanks in order to show me that who received it is aware that I'm a professional as well as an human being like him".* (Participant 12: 38 years old male, APE).

> *"I would like to receive constructive feedback on my mistakes as it would allow me to prevent future errors and improve my practice as well."* (Participant 3: 28 years old male, APE).

It was stressed that non constructive feedback, depersonalised responses and automated messages should be avoided because they would be de-motivating.

"it should be de-motivating if whether you submitted data or no there is an automated message sent to you... also if the feedback isn't personalized in order to show your performance as well as constructive it should be frustrating." (Participant 7: 29 years old male, APE).

Summary – most useful kind of response to submitted data
Most useful kind of response to submitted data: personalised messages combined with a vote of thanks and constructive feedback on the data submitted and how to complete the forms was commonly cited as useful and motivating.
Suggestions / recommendations: automated messages and non personalized responses as well as non constructive feedback should be avoided as they were viewed as de-motivating.
Key discussion points: how automated messages should be designed in order to avoid being de-motivating? Is it enough to tailor an automated message to an APEs context by making it relevant to the data they have collected or will the fact that it is still automated lead to it being de-motivating?

4.2 Electronic data submission and response to APEs

- **Benefits**

Almost all participants acknowledged that electronic data submission would be beneficial. Overall when compared to paper based data submission, it was clearly felt that due to distance, travel time, transportation and especially financial constraints that APEs preferred data submission by mobile phones. According to them, it would be more likely to reduce the recurrent challenges related to costs and time consumed on travel to and from the Health facility. When compared to paper based data submission, it was clearly felt that due to geographic and financial constraints, electronic data submission is preferred as it would allow the APEs to save time and money as well.

"As our statistics need to be submitted physically I have to monthly travel to the health centre for this purpose which takes a lot of time because the facility is far from here and it is difficult to catch a collective taxi; obviously I have to face the same problems on the way back to the community... at the end of the day, I almost loss my day of work. So, if you [inSCALE] are thinking of enabling us to send the statistics via phone it will be very welcome because it will allow me to save time". (Participant 7: 29 years old male, APE).

"It is a good and opportune idea because it would allow us to overcome the challenges relating to travel costs and indeed save our money; you know it has been frustrating to spend your own money for work related activities... ". (Participant 3: 28 years old male, APE).

In addition, some APEs stressed that such an approach would be more likely to facilitate their submission as for recording purposes they would no longer have to complain about record book and paper and pen stock outs.

> *"Being able to submit data through phone will mean no more complaints relating record book, paper and pen's stock out...".* (Participant 9: 29 years old male, APE).

Besides some APEs stated that being able to submit data from anywhere as well as at any time of the day would be seen as a mean of task flexibility i.e. being able to submit data and receive feedback, and when there is a mistake, correct and re-submit without have to travel to the health facility would be felt such as a motivating improvement.

> *"As for data submission I have experienced multiple working arrangements in order to travel to the health centre being able to submit data from the community and receive feedback will increase my motivation about data submission as well as reduce the community member's concern because they know that when I have to travel to the health centre it has been difficult to find me before 4 pm...".* (Participant 12: 38 years old male, APE).

Similarly, some supervisors stated that electronic data submission would be useful for timely feedback as well as effective follow up because sometimes when the APEs come to submit data they are unable to meet them due to high workload or working outside the health facility.

> *"Sometimes when the APEs come to the health centre don't find me because I have been working or outside; so, I think that data submission though phone would be good because it would enable me as supervisor to feedback at any time and effectively monitor the data submission process".* (Participant 1: 28 years old female, SUP).

Some supervisors stated that such an approach would be of crucial importance as it would enable them to alert the APEs about the deadline submission day and contribute to timely data submission.

> *"Considering that it will be done using the phone when the deadline is closer I can alert the APEs in order to prevent late submission as they will no longer complain about lack of money for transportation".* (Participant 4: 32 years old female, SUP).

- **Potential Challenges**

Some supervisor and implementer participants were concerned about the feasibility of such an intervention as the data quality assurance and amount of indicators/data collected were seen as challenging factors. Among these participants there was a common concern relating the APE skills to handle such new technology and insert correctly all the collected indicators.

> "*I'm worried about the APE ability to handle this technology as well as to ensure good data quality because they have been collecting and submit a lot of indicators and indeed to insert data in the phones require much more concentration than writing in the paper*". (Participant 2: 29 years old male, IMP).

Since in some areas there is typically poor network connection it was felt that an important challenge related to the potential for late data submission and time being spent searching for a network signal. To overcome this potential limitation it was suggested to combine the two network service operators.

> *"As in some places there is limitation relating network connection I think it will be a key challenge for the success of this intervention... as for prevent later submission as well as time consuming constraints I suggest that you [inSCALE] have to ensure that all the APEs are connected to a network service operator that provide the best quality signal in the community.* (Participant 2: 39 years old female, SUP).

Some APEs raised a concern regarding the time required to fill the electronic form and the form shape/format as well as the length of the space to insert and record the data as according to their experience they weren't sure if there is enough space to convey the full range of indicators they usually submit on the proposed mobile phone handsets or at least via SMS.

> *"I think this approach will be time consuming because write in the paper isn't the same to typing in the phone".* (Participant 6: 28 years old male, APE).

> *"I'm not sure but I feel that it will be difficult to insert all the required indicators because I think that in the phone there is no enough space to write a large SMS... I mean for example a SMS that convey more than 5 pages".* (Participant 8: 28 years old female, APE).

4.3 Data would like access to – implementers?

For effective planning and coordination all implementers suggested that they should have access to all data indicators as it would enable them to have a whole picture of the APE work.

> *"For me I need to have access of all the indicators because it will enable me to design a plan accordingly as well better coordinate all the activities".* (Participant 4: 30 years old male, IMP).

4.4 Which data supervisors and implementers believe supervisors should have access to

Similarly to the implementer respondents all supervisors stressed that they should have access to the full range of the indicators collected and submitted by the APEs in order to be aware and informed regarding the performance of the APEs they supervise as well as being able to use the data for planning purposes.

> *"We as supervisors should have access to all the indicators because we are responsible for overseeing the APE and we need to be aware and informed about everything related to the APE work in order to get a comprehensive picture of the APE work and assess their performance".* (Participant 5: 25 years old female, SUP).

Summary - electronic data submission and response to APEs
Electronic data submission and response to APE: benefits were felt as time and money saving, improving the APE motivation regarding the task, flexibility in submission timing and location, reducing record book, paper and pen stock outs, the potential for providing timely feedback as well as effective follow up and less delays. Anticipated challenges related to the necessary skills to handle such new technology and data quality assurance/quality control of data entry, limited network coverage, amount of indicators resulting in time consuming data entry and the potential inadequacy of a phone for sending the required data as it was seen as large – too large for an SMS. Supervisors and implementers expressed a preference for having access to all data indicators to understand APE work and for planning purposes.
Suggestions / recommendations: for successful implementation of this intervention there is a need to train the users regarding effective use and handling of the new technology to maintain data integrity. The length and shape/format of the electronic form should be user friendly and again there is a strong suggestion that inSCALE combine the two network service operators to maximise connectivity.
Key discussion points: how can a useful amount of data be sent *via* SMS when the paper based volume of data required for current reporting is estimated at 5 pages? Will the submitted data be available for all who need, how? What is the best local use for submitted data? Is it feasible to feedback to supervisors and implementers regarding all APE submitted data?

4.5 Feedback on specific data submission activities and their usefulness, motivational properties and challenges

Activity A: Receiving a message to thank you for submitting data after you have sent them

- **Useful?**

This activity was seen as useful for the APEs as it was acknowledged that such messages relating vote of thanks are encouraging and indeed provided evidence that submitted data was successfully delivered. It was also stressed that it would be felt such as recognizing the importance of the task.

> *"This kind of message is encouraging as I'll know that the statistics was successfully delivered and indeed it is recognized as important because someone sent me a vote of thanks".* (Participant 10: 23 years old female, APE).

- **Not useful?**

Not applicable

- **Motivational?**

Similarly it was commonly seen that being thanked for performing the submission task would be felt such as recognition as well as motivating because all the people as human being appreciate such messages. For many participants it was also felt as motivating because it would increase their commitment and effort in order to submit the data as expected.

> *"You know any person value such messages and I think that it will be appreciated as well as motivating for the APEs because they will feel as recognized".* (Participant 4: 32 years old female, SUP).

> *"For me being thanked after data submission will be motivating because I'll know that who received it recognize that I've performed an important task meaning much more effort to deliver as expected".* (Participant 1: 33 years old male, APE).

Besides it was stressed that getting specific feedback on the data submitted would enable the APEs to ensure good quality of data submitted.

> *"Receiving message of thanks as well as specific feedback will be motivating to the APEs because it would enable them to perform as expected and indeed submit good quality data".* (Participant 2: 39 years old female, SUP).

- **Not motivational?**

As for motivating purposes, it was suggested that such messages should be personalized as well as promptly provided; in addition it was stressed that non personalized and automatic response not relating to what was submitted would be felt as de-motivating and indeed resulting in less commitment to perform the submission task.

> *"I'll appreciate if the message of thanks is specifically directed to me as for example thanking for the data submitted including my name in the content...".* (Participant 4: 41 years old female, APE).

> *"For me it would be de-motivating if I received such message many days after submitting data because it could sound as a non proprietary task.... the message with vote of thanks and feedback must be immediate or at least timely provided in order to prevent less commitment to perform the submission task".* (Participant 11: 46 years old male, APE).

- **Problems or challenges**

As described above, some APEs were concerned about the content and timing of such responses as they were aware that their supervisors and health workers who use to deal with their related work are very busy people. Regarding the concern related to the content of such messages it was stressed that there is a risk of receiving a non constructive feedback or responses not related to the submitted data.

> *"As our supervisors and all the health workers are very busy people I'm concerned about the content of such messages as they couldn't have enough time to elaborate a constructive feedback; in addition there is a risk to be sent some responses not related to what was submitted due to long time between the submission and response or forgetfulness of the related context since they are also human beings like us".* (Participant 5: 32 years old female, APE).

Some supervisors acknowledged they have a high workload meaning that sometimes this could prevent to a certain point an effective accomplishment of the timely response and constructive feedback. Some felt that their occupation in the health facility could negatively interfere resulting in less engagement in providing effective and constructive feedback.

> *"As sometimes I face high workload I'm concerned if I'll always be able to provide a timely feedback as desired..."*. (Participant 4: 32 years old female, SUP).

> *"I see this such as a good idea but I'm wondering if the supervisors would be always fully engaged in order to provide an effective feedback which as consequence could result in a recurrence of the same mistakes".* (Participant 6: 23 years old male, SUP).

Again it was cited that network coverage limitation could negatively influence the timing of data submission and response/feedback as well.

> *"In our district there are some areas where the network signal is poor therefore I think that to a certain extent it would negatively influence both the timing of data submission and response".* (Participant 12: 38 years old male, APE).

Activity A – summary
Positive feedback: overall this activity was seen as useful as it would positively influence APE motivation, commitment and effort to perform the submission task as well as deliver good quality data. It was stressed that to be effective such responses should be constructive, timely and personalised and relevant to the APE's context as well.
Potential challenges: it was felt that automatic responses not related to what was submitted would be de-motivating. Time poor supervisors may not be able to get across the volume of data in time or have too many competing demands on their time to issue a timely response with de-motivating consequences for APEs. Some doubted whether network coverage was adequate to support this intervention.
Suggestions / recommendations: develop a policy regarding responsiveness to ensure timely and constructive responses as well as ensuring messages are tailored to context and personalised thank you messages which ideally include each APE's name. For effective implementation it is seemingly necessary for inSCALE to consider combining access to the two main network providers.
Key discussion points: to what extent can this activity potentially influence APE and supervisor performance and behaviour regarding the submission process? Who will be responsible for tailoring messages to APE context and how will this process work? Is it feasible to deliver prompt and context specific messages to APEs in a way they find motivating when the proposal is for a mass SMS intervention?

Activity B: (For APEs only) receiving summaries of the data you have submitted on your mobile phone such as the total number of children you have seen since you started

- **Useful?**

This activity was seen positively by many APEs for improving performance as well as awareness of what have been done since they started especially the trend of diseases, main/common diseases, total number of patients treated and total number of house to house visits as well.

> *"I want to see what I have been performing since I started work because it could help me to know where I performed well and bed in order to correct my practice...".* (Participant 2: 42 years old female, APE).

> *"I think that getting this kind of feedback will be useful for my awareness on important information such as the trend of diseases I treated, main/common diseases treated, total number of patients treated and total number of house to house visits".* (Participant 3: 28 years old male, APE).

- **Not useful?**

Not applicable

- **Motivational?**

Some APEs felt that being able to know and understand how they have been performing since they started working would be seen as an evidence of what they have done; others stressed that it would enable them to make a self assessment on how and to what extent they have been helping their communities for ensuring better disease control and prevention as well as better health outcomes;

> *"Knowing for example the total number of patients I have treated since I have started will make me work harder as it will be an evidence that my work is really important in my community".* (Participant 4: 41 years old female, APE).

> *"This activity will motivate me so much because I will know the exact picture of my general performance which will enable me to make a self assessment in order to know how and to what extent I'm helping my community in preventing diseases and ensuring good health".* (Participant 5: 32 years old female, APE).

- **Not motivational?**

Not applicable

- **Problems or challenges**

Not applicable

Activity B – summary
Positive feedback: this activity was seen as beneficial and motivating as it would enable the APEs to have evidence of what they have done as well as make a self assessment on how and to what extent they have been helping their communities to ensure better disease control and prevention and better health outcomes.
Potential challenges:
Suggestions / recommendations: ensure the content of such summaries is balanced, user friendly and constructive. As for APE motivation, summaries should be shared with community leaders and community members for example during community meetings as it would be of crucial importance to inform all the community members about the importance of the APE work as well as to evidence a clear picture relating the trend of diseases the APE treated, main/common diseases treated and the total number of patients treated by the APE.
Key discussion points: should such summaries be shared when there is bad performance? If yes, how should any potentially negative consequences be managed?

Activity C: (For APEs only) using the submitted data to check your performance and giving you feedback

- **Useful?**

Receiving feedback and being advised about their performance was seen as very useful for many APEs because it would enable them to prevent mistakes and improve performance as well.

> *"All feedback is desirable and indeed welcomed because it will help me to prevent the same errors and ultimately improve my performance".* (Participant 1: 33 years old male, APE).

- **Not useful?**

Not applicable

- **Motivational?**

Overall it was felt by many APEs that being provided with constructive feedback would enable them to be aware of their strengths and weaknesses resulting in increased motivation to work harder and perform as expected.

> *"For me it will be motivational because when there is a task on which my performance is weak I'll be motivated work harder and prevent future mistakes".* (Participant 10: 23 years old female, APE).

- **Not motivational?**

Not applicable

- **Problems or challenges**

The common problems cited were related to the constructiveness of the feedback, tone of communication and fear of being dismissed due to bad performance.

> *"To me if the feedback isn't constructive it won't be welcomed because it will not help me to prevent my mistakes and improve my performance as well".* (Participant 3: 28 years old male, APE).

> *"...as you can see I'm adult and of course I'll not accept or admit that a supervisor communicate such feedback without respect. For me it should be communicated privacy and respectfully... I mean it should be communicated only for me in a private space because I am who performed the task".* (Participant 11: 46 years old male, APE).

> *"Such feedback would be used for dismissing purposes? I'm wondering if one APE is permanently evaluated as performing badly it should be used for dismissing purposes".* (Participant 8: 28 years old female, APE).

Again it was stated that the poor quality signal recurrent in some remote areas of the district would be seen as a limitation to the effective implementation of such activity.

> *"As there are some areas where the network connectivity is limited I think that it would negatively influence the timing of this activity....".* (Participant 2: 29 years old male, IMP).

Activity C – summary
Positive feedback: overall it was seen positively as it would enable the APEs to be aware of their strengths and weakness leading to the prevention of mistakes in the future, performing as expected and working harder for improving performance.
Potential challenges: The tone in which the feedback is communicated and its constructiveness were cited as main concerns. The fear for being dismissed due to bad performance was identified. The viability of the intervention in conditions of poor network connectivity was raised
Suggestions / recommendations: ensure the feedback is constructive and communication is polite and respectful. Also it should be communicated on a confidential and private way.
Key discussion points: how can inSCALE ensure feedback is received constructively and not perceived as being critical or disrespectful? How best can confidentiality be ensured?

Activity D: (For APEs only) using the submitted data to determine how much face to face supervision you need (i.e. those who perform well get less supervision)

- **Useful?**

As all the APEs, supervisors and implementers acknowledged that there was less face to face supervision than desired due to geographic and financial constraints, this activity was

unanimously seen as having great potential to enable the APE program to effectively redirect resources to necessary supervision visits.

> *"As there is lack of financial resources and is challenging to travel around the communities I think this activity will enable the APE program to redirect the supervision visits to the APE who really need it meaning save money and time".* (Participant 4: 30 years old male, IMP).

Some APEs stated that this activity would help them not only to anticipate their supervisory meetings also to be better prepared as well as planning to work around and closer to the community health post where they store the medicines, commodities and record book.

> *"I think this activity will help me to be better prepared and plan to work around the community health post to be easier to find me when he comes to visit me in the community".* (Participant 7: 29 years old male, APE).

- **Not useful?**

Not applicable

- **Motivational?**

Not applicable

- **Not motivational?**

Not applicable

- **Problems or challenges**

Not applicable

Activity D – summary
Positive feedback: helping APEs anticipate and prepare for supervision meetings as well as enabling the APE program to effectively redirect resources to supervision visits which are considered to be critically important.
Potential challenges:
Suggestions / recommendations:
Key discussion points: the previous activity raised concerns that targeted supervision, if not delivered sensitively, would be viewed as punitive action. How best can inSCALE ensure this proposed intervention avoids the same risk?

Activity E: (For APEs only) having treatment guidance steps programmed into the phones which assists you in your work with patients

- **Useful?**

Both the APEs and supervisors stated that this activity would be useful as it would provide the APEs with a useful and easily accessible tool for prompt support and performance improvement as well; in addition some supervisor and implementer participants welcomed this activity and stressed that it would help to ensure that those who require frequent technical support would have this need met.

> *"Being able to use such treatment guidance will be helpful because it would enable me to immediately check on my phone instead of call my supervisor to ask for advice..."* (Participant 3: 28 years old male, APE).

> *"This activity is useful as it would reduce the need to call supervisor to ask for technical support".* (Participant 3: 52 years old male, IMP).

Considering the limitation of network connectivity it was seen as useful both in terms of maintaining APE performance wherever s/he is working and cost saving as it would prevent the need to so frequently call the supervisor to ask for advice.

> *"…as it will be uploaded in the phones it will be accessible from anywhere meaning not being dependent of the mobile network connectivity".* (Participant 2: 29 years old male, IMP).

- **Not useful?**

As the APEs do not have a professional health training some supervisors felt it would promote misinterpretation and to a certain extent confusion in the context of complex health cases.

> *"The treatment guidance uploaded in the APE phone would be least useful because the APEs haven't health professional training, which means that there will be a potential high risk for misinterpretations".* (Participant 1: 28 years old female, SUP).

- **Motivational?**

Overall this activity was seen as motivational by all the respondents as it was felt as an important job aid.

> *"It will be motivational because when I face a difficult for treating a patient for example, a patient with malaria when there is no RDT, I can immediately check on my phone for taking better decision".* (Participant 12: 38 years old male, APE).

- **Not motivational?**

Not applicable

- **Problems or challenges**

Some supervisors raised the issue that as it wasn't clear from the activity description what the disease treatment guidance to be uploaded to the phone would actually be comprised of, they felt there was a risk of there being too much content and potentially conflicting content uploaded to the phone.

> *"You know the APEs have treating many diseases in their communities... what diseases are you [inSCALE] going to consider? I'm wondering because in the health care context there many confounding disease and symptoms which are difficult to explain over an uploaded treatment guidance".* (Participant 4: 30 years old male, IMP).

As the length of a treatment guidance uploaded in the phone could be large some supervisors and implementers were concerned that it may be too time consuming and sometimes boring due to typical phone font size.

> *"Due to the length of the display screen as well as the length of the treatment guidance itself I think will be needed a lot of time to read and understand which at the end of the day could be seen as something boring".* (Participant 1: 26 years old male, IMP)

Some supervisors and implementers were worried about the effectiveness of such uploaded treatment guidance because the APEs are less educated people as well as weren't trained as professional health workers. These participants felt this may lead to many interpretations which in the context of health care isn't desirable.

> *"The one challenge I see with this activity is the APE poor health background as it may lead to a sort of misinterpretation... usually such interventions have been effective if provided as refresher training".* (Participant 3: 23 years old female, SUP).

Considering the highlighted concerns and potential risks it was suggested that to be effective such treatment guidance should be simple, clear, objective, interactive, user friendly and easy to understand in order to prevent misinterpretation.

> *"This activity would be useful but it will depend on the way such treatment guidance is tailored... as for ensuring effectiveness I think this guidance should be clear, objective, short, interactive and easy to operate and understand because if it is misinterpreted may lead to a disaster...".* (Participant 2: 39 years old female, SUP).

Activity E – summary
Positive feedback: for some APEs, supervisors and implementers this activity was seen as positive in terms as providing an accessible and mobile job aid as well as potentially being beneficial for increasing motivation, preventing mistakes and promote better performance. It was also recognised as potentially providing important technical support to those who need it most and reducing the burden on supervisors.
Potential challenges: there were some concerns expressed relating to the complexity of each disease and whether guidance for their treatment could be appropriately communicated through this medium, that it could be time consuming due to the length of such treatment guidance over the phone as well as comprehension. There was some apprehension that as the supervisor was not on hand to explain and that APEs did not have professional health training, there could be misinterpretations.
Suggestions / recommendations: as for preventing misinterpretation the recommendation was that treatment guidance should be simple, clear and objective, interactive and easy to handle as well as understand.
Key discussion points: which disease treatment guidance should be uploaded to the phones? Which would be the best way of tailoring such treatment guidance in order to prevent the intervention from being unproductively time consuming as well as boring? How simple should such treatment guidance be? Assuming it is simplified, how best can the balance between avoiding misinterpretation and ensuring quality control is maintained?

Activity F: (Supervisor and implementer groups only) supervisors receiving text messages with individual performance indicators for each of the APEs they supervise so they can identify who needs extra support and the type of support needed

- **Useful?**

For some supervisors it was seen as opportune and useful for assisting them to identify the weak APE performers as well as targeting support to the APEs who need it the most.

> *"This is a very good idea because will help us to identify all the APEs who don't perform as expected and develop appropriate strategy to ensure that all the weak performers are effectively supported and all the APE are performing under the standard as well*". (Participant 4: 32 years old female, SUP).

It was also felt by some supervisors and implementers that by being able to be aware of individual performance indicators for each the APE they supervise would help them to effectively plan and prepare the content of the supervision encounters as they could focus their support on where it is needed the most.

> *"This is a very important activity because it will allow me to plan and prepare the content of the support accordingly...".* (Participant 5: 25 years old female, SUP).

> *"It would help the supervisors to know who they are going to support, what they are going to discuss and mainly getting prepared in order to ensure good quality support".* (Participant 1: 26 years old male, IMP).

- **Not useful?**

Not applicable

- **Motivational?**

This activity was considered to be potentially motivational by some supervisors as it would stimulate their commitment to help the weak APE performers ensuring good quality health care delivery.

> *"As health worker If I receive such data it will motivate me to be much more engaged and work harder in order to help such weak performers as I know that in the health context some mistakes may have negative consequences"*. (Participant 1: 28 years old female, SUP).

- **Not motivational?**

Not applicable

Problems or challenges

There was some concern that it may be too time consuming to provide such targeted support which could be prevented if all the APEs were put together for refresher training.

> *"Imagine a scenario that each APE I supervise have an specific task on which his performance was weak it means that I'll have to pay individual attention... at the end of the day it will be too time consuming which could be prevented through a refresher training".* (Participant 3: 23 years old female, SUP).

Activity F – summary
Positive feedback: implementers and supervisors welcomed this activity stressing that by targeting those weak APE performers it would help supervisors with their planning and preparation for supervision encounters where they could provide more effective support. This was felt to have the potential to motivate supervisors.
Potential challenges: as for providing targeted support for each APE it was felt by some supervisors that this activity may be too time consuming.
Suggestions / recommendations: clearly explain to supervisors the purpose and application of targeted and 'extra' APE support.
Key discussion points: how can the perception of punitive action be avoided when supervisors themselves report that such an intervention may help with 'weak' performers? How best can appropriate language and sensitisation be used to avoid this perception?

4.6 Feedback on monthly motivational text messages

- **What should they be about to be motivational**

The common themes across respondent groups regarding monthly motivational text messages were that they should include recognition and a vote of thanks as it would be valued and seen such encouraging. It was also felt that APE respondents wished to receive text messages personalized with their names to appropriately acknowledge the importance and positives of their work. This is consistent with the expressed desire to be thanked for efforts but in a way that can improve motivation.

> *"Receiving messages stressing the importance of my work in the community will mean appreciation, recognition and indeed an encouragement to keep working".* (Participant 12: 38 years old male, APE).

> *"For me it will sound as natural and encouraging if such messages include my name and the positives of my work in the community".* (Participant 1: 33 years old male, APE).

> *"This intervention is very welcome because all human being accept and value a message of acknowledgement and vote of thanks after performing a task".* (Participant 3: 52 years old male, IMP).

- **How formal or informal to respond well and be motivational**

For many APEs such messages should be formal as it would be seen as a serious and respectful intervention. For acknowledgement and motivation purposes as well as to prevent distrust of the source and to stimulate interest it was suggested that such messages should be politely phrased.

> *"This message must be formal because it will be felt as something serious and respectful…".* (Participant 11: 46 years old male, APE).

> *"You know as for motivating purposes the content of such message should be tailored in a polite way in order to prevent trustfulness of the source and ultimately its effectiveness".* (Participant 4: 30 years old male, IMP).

As for preventing miscommunication it was also cited that such messages should be simple, clear, objective and not too long.

> *"As for ensuring good communication and indeed its effectiveness such messages should be simple and objective and not too long as well".* (Participant 2: 39 years old female, SUP).

- **From an influential person? Who?**

Overall it was commonly suggested by many participants that such messages should be from influential people from the health system.

> *"I think that receiving messages from supervisors, district medical chief, district health director, provincial health director and other well known people from the ministry would be valued by all the APEs".* (Participant 3: 28 years old male, APE).

Besides some participants thought that motivational messages from influential people from government (district or provincial level) and civil society should be valued as well.

> *"... Messages from influential people from government such as district administrator or civil society such as musicians should be valued by the APEs as well".* (Participant 3: 52 years old male, IMP).

- **Potential or Problems**

As for effectiveness it was also suggested that the influential person if used should be indeed known as role model to the APEs in order to prevent misinterpretation and miscommunication as well.

> "*To be accepted and valued by APEs such messages should come from someone who is really known as role model otherwise it will be wasting of time and money*". (Participant 7: 29 years old male, APE).

Summary - feedback on monthly motivational text messages
Most motivational kind of text messages: messages which recognize the recipient (i.e. use their name), have encouraging content, include a vote of thanks and acknowledge the importance and positives of APEs work in the community were viewed as having the greatest motivational potential. For many participants such messages should be respectful, formal and polite in order to ensure they are taken seriously and stimulate interest. It was also suggested that such messages should be simple, clear, objective and not too long.
Potential challenges: Unless recognised role models are used this aspect of the intervention was suggested as representing a risk. Overly familiar, flippant or casual messages are, based on what APEs said would be effective, to be avoided.
Suggestions / recommendations: be sensitive for the need for acknowledgement of efforts and personalisation of responses using each APE name.
Key discussion points: who will design such messages and how will they be quality controlled to ensure the language and tone doesn't offend and is truly effective?

4.7 Implications

Most useful response to submitted data

1. APEs felt that personalised messages conveying appreciation for their work and containing constructive feedback regarding submitted data were most useful and motivational but cautioned that obviously automated responses were neither useful nor motivational. Intervention designers therefore need to evaluate whether tailoring an automated message to an APEs context by making it relevant to the data they have collected will be effective or the fact that it is clearly still automated will lead to it being de-motivating.

Electronic data submission and response to APEs

2. General enthusiasm for the simplification of data submission, as well as the flexibility of submission timing perceived to flow from the introduction of an electronic submission process, was tempered by a range of concerns regarding both the technical capacity of users and the capacity of the phones to transmit sufficient data volume in a user friendly manner. Intervention designers will need to reconcile the apparently competing priorities of creating a user friendly system and supporting the transfer of sufficiently detailed information to be useful. Respondents for instance raised the question of how a useful amount of data can be sent via SMS when the paper based volume of data required for current reporting is estimated at 5 pages.

3. For successful implementation of a data submission and automated response intervention there is an apparent need to train users regarding effective use and handling of the new technology to maintain data integrity as well as enthusiasm for the intervention.

Activity A

4. There was an apparent assumption that supervisors would be the ones to make an assessment of what is most relevant to feed back to APEs in the context of this intervention. There was some concern expressed regarding whether supervisors would have time to do this in such a way as to ensure responses are constructive, timely, personalised and relevant to the APE's context which is what APEs stressed they would need to be to be in order to motivate. Intervention designers need to be aware of APE's criteria for impact but also consider who is to assess the data and craft the messages in the context of the competing priorities of supervisors. Clear communication of roles to manage expectations is also necessary.

Activity B

5. Respondents were generally enthusiastic about this intervention though tended to assume the summaries would always convey positive information and useful evidence of what they have done. Intervention designers need to therefore ensure summaries are balanced and constructive or consider how to sensitise APEs when summaries indicate slow progress, poor outcomes or other information that may not be received so positively.

Activity C

6. While the positive impact on future performance was recognised the tone in which the feedback is communicated and its constructiveness were cited as key concerns as well as the fear of being dismissed due to bad performance. The intervention should therefore be designed to ensure feedback is constructive, and communication is polite and respectful and confidentiality is maintained.

Activity D

7. While advantages of this intervention such as helping APEs anticipate and prepare for supervision meetings, as well as enabling the APE program to effectively redirect resources to supervision visits were identified, concerns were raised that targeted supervision, if not delivered sensitively, would be viewed as punitive action by APEs. Intervention designers therefore need to ensure this perception is avoided by allocating sufficient time and thought to the careful introduction of the purpose and process to all involved.

Activity E

8. Respondents were generally positive about the potential of this intervention for addressing technical support gaps for APEs and improving performance. They did however caution against over complication and recommended that treatment guidance be simple, clear, objective, interactive and easy to handle as well as understand. Designers will need to balance the need for user friendliness and simplicity with ensuring the technical accuracy of what is communicated.

Activity F

9. While generally positively received by supervisors and implementers as assisting with planning and preparation and therefore the provision of more effective support, some also felt that the process involved would add to their workload rather than streamline it as intended. Sensitivity to activities perceived as adding to supervisor workload is high and the intervention design therefore needs to address appropriate planning for supervisor sensitisation.

10. Some supervisor respondents felt that the intervention would help 'weak' performers. As a separate finding is that APEs are sensitive to the perception that supervisor communication may be punitive, supervisors interpreting the intervention thus indicates that careful attention must be paid to the introduction of the intervention if it is to be implemented successfully.

Feedback on monthly motivational text messages

11. APEs respondents felt that in order for messages to be motivational they have to be personalised and ideally address the recipient by name, be encouraging, include a vote of thanks and emphasise the importance and value of APEs work. Many also emphasised simplicity and a respectful and polite tone. APEs recommended avoiding

overly familiar, flippant or casual messages. For intervention designers striking the right balance based on these finding will be challenging and thorough pre-testing is therefore recommended.

12. Utilising celebrities or known figures to send messages was seen as potentially effective dependent upon the level of level of recognition of and respect for this person by recipients. It would seemingly represent a risk to utilise such a figure as it could potentially polarise opinion as to the reliability of the messages.

5. REFERENCES

Black RE, Morris SS, Bryce J: Where and why are 10 million children dying every year? *Lancet* 2003, 361:2226–2234.

Jones G, Steketee RW, Black RE, Bhutta ZA, Morris SS, and the Bellagio Child Survival Study Group. How many child deaths can we prevent this year? *Lancet*, 2003, 362:11–17.

WHO/UNICEF. *Handbook:* IMCI management of childhood illness. 2005 edition. Geneva and New York, WHO and UNICEF, 2005.

Winch P et al. Intervention models for the management of children with signs of pneumonia or malaria by community health workers. Health Policy and Planning, July 2005, 20(4):199–212.