Royal Tropical Institute

mHealth for maternal and newborn health in resource-poor community and health system settings, Sierra Leone - Phase 2

Progress report to DFID

November 15, 2012

Commissioned by DFID

Submitted by:
Royal Tropical Institute (KIT) on behalf of the consortium including Ministry of Health and Sanitation (MoHS), University of Sierra Leone, Medical Research Centre (MRC), Text to Change and MannionDaniels.

Photos: MRC, KIT and Fatou Wurie Photography

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1 Introduction

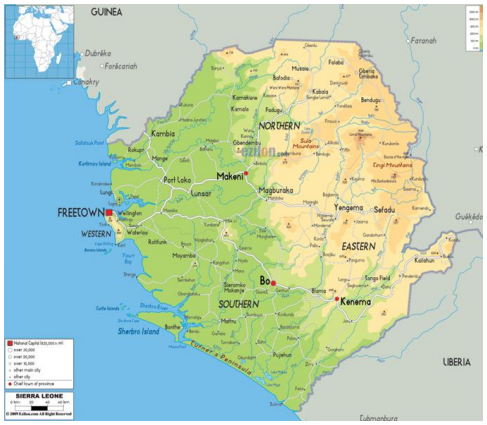
The 'mHealth for maternal and newborn health in resource-poor community and health systems settings, Sierra Leone – Phase 2' research project is funded by the DFID program on New and Emerging Technologies Research Competition (NET-RC). This program aims to realise the potential of new and emerging technologies for poor people by identifying applications from which, directly or indirectly, they can reap tangible benefits such as improved health and reduced risk of disease.

Research under the NET-RC programme would (i) focus on the best ways to responsibly introduce and use relevant, effective and affordable new technologies in resource-poor settings; (ii) identify and deal with barriers that prevent the disadvantaged to benefit; and (iii) address possible risks in terms of undue effects on development goals.

The DFID program entails two phases, Phase 1 being a feasibility study which assists country teams to prepare more extensive intervention research proposals for phase 2. For the current project, the first phase was successfully implemented in Sierra Leone between December 2010 and August 2011, during which the feasibility study 'mHealth for maternal and newborn health in resource-poor community and health systems settings, Sierra Leone – Phase 1' was undertaken.

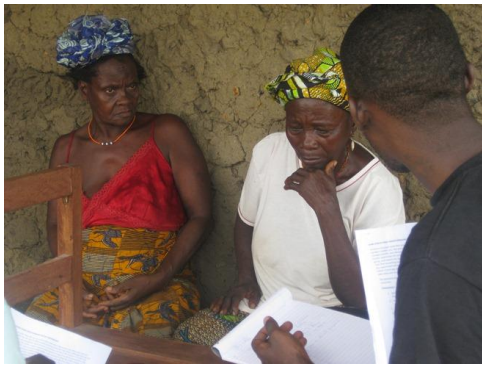
Building on the Phase 1 results, the 'mHealth for maternal and newborn health in resource-poor community and health systems settings, Sierra Leone – Phase 2' project proposal was submitted; it was approved by DFID in July 2011. The Phase 2 contract was signed in October 2011, after which implementation preparations started.

This report intends to share progress to date regarding the main process and contents-related issues of the Phase 2 implementation phase, covering the first half of the first 12 months of the 24-month implementation period. It furthermore provides an outlook on the next - and last - twelve months.



This mHealth intervention research project has raised expectations among the consortium partners that the opportunities and challenges of using mobile communication for advancing the health of populations in need, uncovered by the research findings, will be used towards a better use of new and emerging technologies.

2 Phase 1 study results



The objective of the feasibility study was to assess the feasibility of introducing and operating selected mobile communication technologies for improved communication on MNH, in a fragile health system in resource-poor settings.

The research was mainly qualitative, exploratory in nature and was implemented in two sites, Kenema district and Western Area. Main research methods included semi-structured interviews, in-depth interviews, focus group discussions and literature review. Main research participants were health workers, health managers and community key informants from the two sites; health service clients and male, female and young community members from the districts; and key informants (health managers and experts) at national level.

The study found that health workers, clients and other community members alike see much potential in using mobile communication across various mHealth domains, to improve information, service delivery, access, quality, efficiency, responsiveness and, ultimately, health outcomes.

Work-related use of mobile communication for health is already very common among health workers. The preferred mode of communication is voice calls, although half of the health workers also use text messaging (community members do not). Barriers identified relate to external factors such as geographical coverage of the mobile network and literacy levels, but also to factors that could be addressed by the health system, including poor access to battery charging facilities, poor access to a duty phone and poor access to/payment of top-up cards.

Data confirmed that almost all health workers possess a mobile phone, however only one-third of interviewed clients have one, although another third have conditional access to a family member's phone. Community members consistently mention MNH as the most important area that would benefit from mHealth strategies.

"I expect them to call me and check on my general welfare and to encourage me to visit the clinic frequently, so that the position of my baby can be checked on a regular basis." – Female client, Kenema

Expectations regarding mHealth among both health workers and community members were found to be high, although some health workers fear an increased workload; while confidentiality and privacy issues also raise concerns especially in view of the practice of 'phone sharing'.

Communicating with and receiving relevant information from mobile network operators regarding coverage data, subscribers and tariffs has been challenging, while also regulator NatCom so far has not been able to share relevant information. This context should be taken into account when pursuing in the field of mHealth in Sierra Leone.

While mHealth is perceived as potentially beneficial in a number of ways, health policymakers and managers may need to prepare for strains and demands on the health system. These include a possible increase in workers' workload; the consideration to establish a 'protocol' for (mobile) communication with clients; standards and systems for an increased information flow among health workers and between these and clients;

considerations of costs to health staff and clients; and governance issues surrounding ethical issues and confidentiality, public-private partnerships and sustainability.

3 Phase 2 research objectives

The study under Phase 2 is an intervention study of quasi-experimental design, using a mixed methods approach. As per the approved research protocol, the following are the interventions and research objectives.

Interventions include:

a) Virtual private network: strengthening communication provider to provider and provider to trained traditional birth attendant (TBA)
b) Regular mobile phone network: improving communication provider to client and client to provider
c) National MoHS toll-free information line on sexual and reproductive health: improving information among clients and non-clients

Research objectives:

The overall research objective is

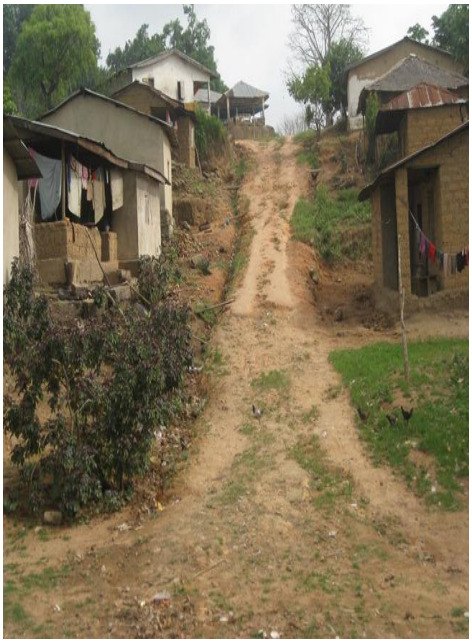
> To assess the effect of integrating mobile communication strategies into existing health service packages in one health district in Sierra Leone, on maternal and newborn health service utilization.

A secondary objective is

> To strengthen research capacity in Sierra Leone with a focus on intervention, action research and realist approaches, as well as dissemination and effective use of research results.

Specific research objectives include:

1. To assess changes in MNH/family planning (FP) service utilization by clients, associated with expanded options for client-initiated and provider-initiated mobile communication:
   - for entire district (engaging all peripheral health units (PHUs) and through the national information line)
   - in the selected PHU catchment areas that implement the intervention involving TBAs



2. To assess changes in health worker job satisfaction and control at work, and other self- reported changes due to expanded options for provider-provider communication and provider-client communication.

3. To assess changes in MNH referral systems, due to expanded mobile communication options

4. To assess changes in maternal death reporting

5. To identify implications for the health system of mobile communication initiatives

6. To make policy recommendations for integration of mobile communication initiatives in district-level MNH service packages.

4 Progress to date

At this moment (month 14), the intervention study is thoroughly underway, with baseline research done and wedge 1 intervention in full swing, accompanied by monitoring activities. In this section we will provide a summary of the preparatory activities for and actual implementation of the research and intervention components.

4.1 Preparation phase

As partly reported earlier, contract signing between DFID and KIT was followed by a number of activities to prepare for actual intervention and research implementation.

Partner consultations and inception mission
The inception phase of the research project started with consultations among consortium partners on the development of the research protocol, timeline and work plan; and the need for a stakeholder start-up workshop.

An inception mission was carried out in November 2011, whereby the Sierra Leonean partners and KIT (i) prepared and conducted the stakeholder meeting, (ii) undertook a field trip to the potential district where the intervention would take place, for initial discussions with the District Health Management Team, and (iii) developed a first draft of important parts of the research protocol.

Stakeholder meeting
A stakeholder meeting was organized and took place during that duty trip. It aimed to validate the proposed intervention by sharing the proposed research plan and obtain important inputs for the contents of the intervention, research and work plan. The meeting successfully drew participation from important stakeholders including mobile network providers, the national telecom regulatory body NatCom, and organisations that are implementing or planning mHealth-type interventions. Those present shared what they knew about the latest initiatives in the field of mHealth in Sierra Leone.

The meeting deliberated on a number of potential mobile communication technologies and related interventions; and achieved consensus on a ranking of priorities. The project management committee thereafter made decisions on the final interventions to be incorporated in the intervention research protocol (see next section).

Also, the stakeholder meeting decided to establish a national mHealth coordination committee, to promote collaboration, share experiences, do advocacy, monitor on-going initiatives and provide technical advice where needed.

Subcontracts
KIT and its consortium partners discussed and agreed on subcontracts to be signed, whereby the Sierra Leone partners agreed to be represented by MRC.

Inception report
In December 2011, an inception report was presented to DFID, including a draft of key sections of the research protocol. DFID's comments were gratefully received and addressed; the report was subsequently approved.

Research protocol and ethical clearance
The research protocol was developed between November 2011 and February 2012, in close collaboration among all consortium partners. It was subsequently submitted in parallel to the Sierra Leonean Ethical Review Committee and the KIT Research Ethical Committee. Approval was received from both bodies by May 2012, albeit in the latter case after dealing with several suggestions for improvement and clarification of certain issues. These clarifications and suggestions concerned the informed consent form; consistency across the various data collection instruments; the sampling strategy; and quantitative analysis.

4.2 Implementation phase: research component

Implementation of the research-related activities took off after ethical clearance of the research protocol. Existing health management information system (HMIS) data are being gathered in addition to data collection via the survey as mentioned below.

Identification and training of baseline survey data collectors
Once the data collection tools were finalised as part of the research protocol review, a training workshop was conducted with a group of local researchers (including those proposed by the University of Sierra Leone), that had been identified earlier. They received training in the various research methods, discussed ethical issues, piloted the data collection tools and adapted them where needed, and addressed quality assurance issues. This process included validation of the baseline survey items.

Baseline survey
The baseline survey among health workers of all health facilities in Bombali district, as designed as part of the research protocol, was implemented before the start of step wedge 1 intervention in August 2012. Topics addressed included, among others:

- Current mobile phone use (network, coverage, work-related use)
- Initiating and receiving of work-related calls and text messages (frequency, who is contacted, reasons), at PHU and district levels
- Communication with clients
- Perceived barriers to mobile phone use (cost, credits, charging)
- Job-related satisfaction and communication

Data were subsequently cleaned and entered into the database for analysis. The write-up of the baseline report is under way and will be available soon.

4.3 Implementation phase: intervention component

Wedge 1 of the intervention started in August 2012, some months later than planned due to delays related to the preparation and ethical clearance of the research protocol and subsequent preparations for the interventions (such as selection and procurement of mobile phones and solar chargers in sufficient numbers). Hence, it was decided to slightly reduce the duration of each of the two wedges from seven to six months, and extend the end-date of wedge two to July 2013.

mHealth Launch Bombali district

August 2012

Intervention district mHealth launch
Early August 2012, an mHealth study launch was organized in the Bombali district where the intervention study takes place. The meeting was attended by district health management team (DHMT) staff and other district level health stakeholders (hospital, council, NGOs), PHU-level MoHS staff and national staff from MoHS and MRC. In fact, in

Bombali mHealth PHU training

August 2012

Bombali mHealth TBA training

August 2012

order to not disturb on-going health activities the scheduled monthly PHU in-charges meeting was used to also address the mHealth study-related interventions and research steps.

Training of district-level staff

The day after the launch meeting, 51 PHU in-charges (or their representatives) of the health facilities selected for the first wedge were trained on the use of cell phones and solar chargers procured for the intervention, the virtual private network, the use of the phones for the intended purposes (communications with supervisors and colleagues, with selected TBAs, with enrolled clients and related protocol), the use of the register for ANC and FP clients enrolling into the mHealth intervention, including informed consent, and for subsequent calls to clients, and the use of other forms and registers.

A few days later, 34 TBAs received a similar training, now also addressing the role of TBAs in identifying new clients and following up existing clients, and the use of phones for communicating with PHUs.

New virtual private network (provider to provider, provider to TBA communication)

This 'closed user group' network was put in place after negotiations with one of the four mobile network operators (Airtel, selected based on geographical coverage, quality of connection and price) and the procurement of mobile phones and solar chargers. The network is operational across all MoHS district health facilities, a selected number of TBAs and a number of MoHS district level management and service staff (mostly DHMT members).

This component is now fully operational and is closely monitored to ensure logistical issues are addressed, e.g.

- proper understanding of the workings of the phone, sim card, batteries, grid charger and solar charger
- hiccups with quite a number of solar chargers that didn't seem to work properly
- issues around registering sim cards with the provider and the virtual private network.

Existing mobile phone network (provider to client, client to provider communication)

A system has been put in place, including the monthly transfer of a limited amount of phone credit to selected PHUs, to allow MoHS staff to use the existing, regular mobile network to communicate with enrolled clients as per protocol. In addition, information is provided to clients that they can now call the health facility mobile phone for queries and emergencies.

This component is also fully operational. Some logistical issues had to be dealt with, such as delays in receiving monthly credit needed to call clients.

Monitoring data as of end-September 2012 indicate that 47 of the 54 PHUs had enrolled 605 antenatal care clients and 368 family planning clients into the mHealth scheme; report-back from the remaining 7 PHUs was pending.

- In several PHUs, few clients seem to own or have access to a phone
- Others report that female clients don't know the telephone number of their partner's phone

- Enrolment by FP clients into the scheme is relatively low, partly as women enrol for FP without their partner's knowledge and don't want to risk him finding out
- Misunderstandings on the part of some of the PHU staff also affected operationalization, these were mostly addressed.

National MoHS, toll-free information line on sexual and reproductive health (client-initiated information provision)
This entails the design of a national call-centre receiving complaints on the national Free Health Care Initiative (FHCI) and providing information on SRHR, led by the MoHS in coordination with partners; the mHealth programme makes a limited contribution. In August 2012 the pillar dealing with submission of FHCI complaints by Facility Management Committees became operational; after operators were trained. This also served as a pilot of the call centre operations.

It is expected that in November 2012, the pillar dealing with FHCI submitted by the general public, as well as the SRHR information line pillar will become operational. Once the information line is up and running, mHealth programme operations in Bombali district will promote the line among community members.

4.4 Other activities and developments

Related to Phase 2 operations, the following activities and other events are worth mentioning.

Support visits
KIT has undertaken several visits to support the preparation and implementation phases described above. One trip was undertaken end-2011 and already reported on in our inception report. Another was undertaken in May 2012, to support the training of the baseline data collectors.

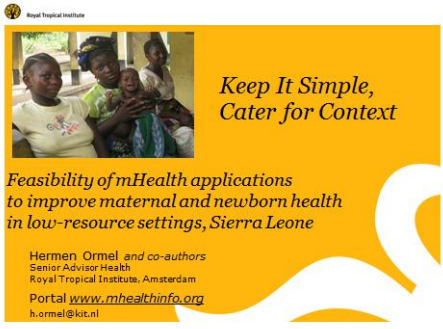
Project management committee
The Sierra Leone project management committee meets regularly to ensure smooth coordination and to plan and follow-up on implementation issues. KIT participates through telephone and web-based communication and when in-country.

Dissemination of mHealth Phase 1 results and Phase 2 plans

It was considered important to seek proper channels for disseminating the results of the mHealth Phase 1 feasibility study while at the same time sharing the Phase 2 research objectives. This was done in several ways:

- Guest-editing a special issue on mHealth of the *Exchange on HIV and AIDS, Sexuality and Gender*, including an article on the Sierra Leone Phase 1 DFID-funded research. The magazine is published by the Southern Africa HIV and AIDS Information Dissemination Service (SAfAIDS) and the Royal Tropical Institute (KIT). It has a distribution of some 4,000 hard copies in low and middle-income countries and a multiple number of electronic downloads
- Delivering a presentation on the mHealth Phase 1 research during the Strengthening Health Systems panel of Mobile Health Summit (Cape Town, 30 May 2012). DFID participated in the same panel
- Delivering a presentation on the mHealth Phase 1 research during the Communication Tools for Health session, Symposium Innovative

Presentation Mobile Health Summit



Cape Town, 30 May 2012

Alliances for Global Health - New Partnerships: New Solutions? (Amsterdam, 26 September), organized by the Netherlands Society for Tropical Medicine and International Health and partners

- Sharing of the phase 1 report with key stakeholders in Sierra Leone at both the November 2011 meeting and afterwards.

Detailed references and web links for the above are presented on the References page at the end of this report.

Sierra Leone mHealth committee and initiatives
MoHS and MRC staff involved in the mHealth Phase 2 work actively participates in the MoHS-led National mHealth Committee. The Committee aims to bring key stakeholders together for proper coordination of existing initiatives and interventions and to facilitate development of new strategies.

One development worth mentioning is that with key donor support (H4+), a scoping mission has taken place to identify priority objectives and strategies for the further development of the Sierra Leonean mHealth infrastructure. The focus of the proposed draft plan is on improving real-time monitoring of (i) maternal and under-five deaths and (ii) stock-outs of life-saving medicines and contraceptives. This implies that the work undertaken under the DFID-supported Phase 1 and 2 studies are still complementary to this initiative and may feed into the future mHealth agenda in Sierra Leone.

5 Next steps

Intervention component
Monitoring of current wedge 1 intervention activities will continue. Special attention will be given to the provider-initiated communication with enrolled clients, as per established protocol, as well as the TBA interactions with existing clients and identification of new clients. Review of data entered into the various forms and registers remains important as well to ensure quality data for later analysis.

In February 2013, wedge 2 will start and run, parallel to wedge 1, till July 2013. The initiation of wedge 2 again requires preparation and training of additional PHU staff and further monitoring.

Research component
Before the start of wedge 2 interventions, the midline survey needs to be completed, scheduled for the 2nd half of January 2013. Preparations for this will start soon and include refresher training of the team of data collectors.

Also, while the baseline survey report is mainly of a descriptive nature, the midline survey and related HMIS data will allow for a first comparison and analysis of data, later to be expanded with the end line survey and HMIS data, plus qualitative study results. To facilitate this and ensure proper advance preparation, a data analysis framework is currently being developed.

References – dissemination of mHealth Phase 1 results

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