

# What do we know about the use of mobile phones for health interventions (*mHealth*) in Africa?

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*This policy brief synthesizes the results of two literature reviews carried out during the exploratory phase of an action research project on global health innovations in Burkina Faso.*

Our analysis of the scientific literature shows there has been very little rigorous research on the use of mobile phones in Africa, and even less in West Africa. The available data are not very precise and do not allow us to draw solid conclusions. Nevertheless, they provide an overview of what has been done in some 15 countries. The present policy brief thus offers some inspiration for those involved in healthcare in Africa.

## Many uses for telephony in health interventions

The numerous options provided by mobile telephony can be put to good use in health interventions in Africa. This is a promising solution, given the continuous expansion of this means of communication in Africa.

Over the past decade, the use of mobile phones to support medical and public health practices, also called *mHealth*, has become more widespread in low-income countries, and particularly in Africa. Several mobile phone functions are used in health interventions: telephone calls, alarms, text messages or SMS (*Short Message Service*), internet and video functions in smart phones (SP), etc. The interactive vocal server (IVS) is another technological option<sup>1</sup>. Combining fixed telephony and computer technology, it enables callers to obtain or provide information, either from a respondent, a pre-recorded voice system, keypad entry, and/or a recorded message.

Some interventions are aimed directly at the population, while others are intended for healthcare service providers, health professionals, or community health workers. Table 1 provides some examples.

Table 1. Examples of *mHealth* by type of service and target public

Services	Healthcare personnel	Population
Requests for services	Requests for consultation and referral in cases of emergency	Requests for ambulance, medical or other services
Treatment of illness	Access to diagnostic guidelines and treatment protocols	Reminders to patients about medical appointments or treatments to be followed, illness self-management
Information transmission and exchange	Data collection and transfer, obtaining advice from colleagues, coordination and collaboration among professionals	Results of diagnostic tests done on users of the healthcare system
Capacity strengthening	Education, support and supervision	/
Governance	Analysis and monitoring of the effectiveness of administrative systems in healthcare establishments	/

(1) This is the technology we decided to test in Burkina Faso after our exploratory phase, and which will be the subject of our next policy brief.



## The positive effects of some interventions using telephony in health

Positive short-term results were observed in some 15 countries. SMS was helpful in improving healthcare services at the level of health professionals' knowledge and of health behaviours. IVS was helpful in reducing health professionals' workloads and improving medical follow-up. We found no studies on the use of smart phones (SP) in low-income countries. Table 2 presents some examples of SMS use in various countries.

Table 2. Examples of effects of SMS interventions in different countries

Country	Intervention and result
Uganda	A project using SMS to raise awareness about HIV resulted in a 40% increase in screening requests.
Thailand	Daily messages to patients with tuberculosis reminding them to take their medications resulted in 90% compliance with treatment.
China	Using SMS to remind patients about their medical appointments was as effective as telephone reminders and reduced costs by one-third.
South Africa	Promotion of a help line for persons with AIDS resulted in a 350% increase in telephone calls.
Peru	Real-time transmission by health personnel of information about symptoms of patients involved in a clinical trial made it possible to respond immediately to negative side-effects.

## Factors facilitating the use of mobile telephony in health in Africa

The undeniable popularity of mobile phones is not the only factor facilitating the implementation of *mHealth* projects. Table 3 summarizes the other facilitating factors identified in a certain number of interventions.

Table 3. Factors facilitating the use of mobile telephony in health

Technology	Sociocultural and human factors	Technological and material factors	Economic factors
All technologies	<ul style="list-style-type: none"> <li>☞ Familiarity</li> <li>☞ Timing of the intervention</li> <li>☞ Response to population demand</li> </ul>	<ul style="list-style-type: none"> <li>☞ Accessibility</li> <li>☞ Ongoing device availability</li> <li>☞ Ease of use</li> </ul>	<ul style="list-style-type: none"> <li>☞ Low-cost or free for users</li> </ul>
SMS	<ul style="list-style-type: none"> <li>☞ Confidentiality</li> </ul>	<ul style="list-style-type: none"> <li>☞ Ability to send messages to multiple recipients simultaneously</li> <li>☞ Simplicity, brevity and immediacy of communication</li> <li>☞ Operational even when the telephone is turned off</li> <li>☞ Archiving of text messages received and sent</li> </ul>	<ul style="list-style-type: none"> <li>☞ Operational in areas where other communication channels either do not or no longer function</li> </ul>
IVS	<ul style="list-style-type: none"> <li>☞ Familiarity with use of telephone</li> </ul>	<ul style="list-style-type: none"> <li>☞ Accessibility of telephones with keypads</li> <li>☞ Constant availability (24 hrs, 7 days/wk)</li> </ul>	
SP		<ul style="list-style-type: none"> <li>☞ Connectivity</li> </ul>	



## Challenges presented by the use of mobile telephony in health in Africa

Whatever the medium used, the major challenge in the area of health communication is the same in Africa as anywhere else. While the use of mobile telephony makes it possible to disseminate certain information, it does not guarantee that the knowledge imparted, and potentially acquired, will be translated into concrete actions related to the health of patients and populations. The studies on different experiences also revealed other challenges facing *mHealth* (Table 4).

Table 4. Challenges facing *mHealth*

Technology	Interventions for health personnel	Interventions for the population
<b>All technologies</b>	<ul style="list-style-type: none"> <li>⊖ Inequalities of access (women sometimes have less access to telephones)</li> <li>⊖ Lack of training for personnel in using the technologies</li> <li>⊖ Impression of increased workload</li> <li>⊖ Continuity of the intervention (loss, theft, or damage to the device)</li> <li>⊖ Functioning of the device (power outages and network failures)</li> <li>⊖ Economic (costs incurred by health personnel related to use)</li> </ul>	<ul style="list-style-type: none"> <li>⊖ Respect for confidentiality (difficult if telephones are shared)</li> <li>⊖ Confusion among users (variety of networks and prices)</li> <li>⊖ Comprehension of the message (multilingualism, illiteracy)</li> <li>⊖ Inequality of access (gender, socioeconomic situation, urban vs. rural setting)</li> <li>⊖ Lack of knowledge about users' rights and responsibilities</li> <li>⊖ Continuity of the intervention (loss, theft, or damage to the device)</li> <li>⊖ Access to the intervention (low penetration rate)</li> <li>⊖ Functioning of the device (power outages, network failures, problems with access)</li> <li>⊖ Economic (especially the cost of the device)</li> <li>⊖ Political and institutional (lack of continuity in national health policies, no national strategy regarding <i>mHealth</i>, etc.)</li> <li>⊖ Duration (short-term projects)</li> <li>⊖ Research (lack of evidence on effects)</li> </ul>
<b>SMS</b>	<ul style="list-style-type: none"> <li>⊖ Capacity of community health workers (occasional illiteracy)</li> </ul>	<ul style="list-style-type: none"> <li>⊖ Acceptability (potential mistrust of the technology among the population)</li> <li>⊖ Access to the intervention (illiteracy, lack of mastery of the technology, not part of the daily lives of people in rural areas)</li> <li>⊖ Limit on amount of information that can be transmitted (160 characters)</li> <li>⊖ Low interactivity</li> <li>⊖ Reliability (possible delays in receiving messages)</li> </ul>
<b>IVS</b>	<ul style="list-style-type: none"> <li>⊖ Lack of knowledge regarding the programs' potential</li> <li>⊖ Dissatisfaction with new technologies</li> </ul>	<ul style="list-style-type: none"> <li>⊖ Telephone reminders (users unavailable)</li> <li>⊖ Limitations related to vocal recognition (sensitivity to noise, dictionaries developed only for certain languages, problems dealing with different accents and pronunciations)</li> <li>⊖ System dependency (need for monitoring/support and additional resources)</li> </ul>
<b>SP</b>	<ul style="list-style-type: none"> <li>⊖ Infrastructure (insufficiency, connection problems)</li> <li>⊖ Economic (inadequate funding)</li> </ul>	



## Recommendations for action

Our analysis of the literature suggests certain recommendations for action.

- ➔ **Financial.** First, the financial implications for all stakeholders (telephony providers, governments, funding agencies, and users) need to be evaluated and taken into account.
- ➔ **Equity.** The program implemented should reach the worst-off and those most affected by the health problems targeted by the intervention.
- ➔ **Technology.** It is advisable to base the intervention on the technological infrastructures already in place if they are functioning well enough. Preference should be given to a technology that is simple, accessible, and familiar to users in their daily lives.
- ➔ **Feasibility.** The context should be carefully analyzed with regard to the program to be implemented; this includes human and technical resources, as well as the population's ability to derive potential benefit from the proposed services.
- ➔ **Community.** The views of the various community stakeholders should be incorporated into the development and implementation of any program.
- ➔ **Cooperation.** Constructive collaboration should be established among the various actors, whether from the public or private sector (users, NGOs, decision-makers, telephony providers, etc.), and incentive measures should be put in place. There also needs to be active government involvement.
- ➔ **Content.** The information transmitted must be relevant and coherent in relation to the context, in both substance and form.
- ➔ **Culture.** Services must be adapted to cultural requirements. It is also important to identify and neutralize any potential cultural obstacles.
- ➔ **Research.** As there have been very few studies showing the effectiveness of these actions, and those few have been conducted in different contexts, it is suggested that a pilot project be carried out first and the effects evaluated before extending it more broadly. Thus, research is necessary to guide the action.

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More information on the use of mobile phones and equity in health interventions is available from the following websites:

- [www.mhealthalliance.org](http://www.mhealthalliance.org)
- [www.healthnet.org](http://www.healthnet.org)
- [www.comminit.com](http://www.comminit.com)
- [www.frogdesign.com/work/project-m.html](http://www.frogdesign.com/work/project-m.html)
- [www.equitesante.org/accueil/](http://www.equitesante.org/accueil/)