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MOS@N

USING A MOBILE HEALTH APPLICATION TO IMPROVE HEALTH IN RURAL BURKINA FASO

Beneficiaries of MOS@N. Photo credit: MOS@N

EXECUTIVE SUMMARY

MOS@N is a nonprofit initiative that seeks to reduce mother and infant mortality through improved access to treatment, as well as reduce the number of people living with HIV (PLHIV) who drop out of receiving treatment by providing accessible treatment and targeted health information using mobile phones. The pilot project was launched in the district of Nouna in rural Burkina Faso on 9 January 2013 and completed on 28 February 2017. It piloted the use of mobile devices to improve the use of health care services by pregnant women, sending voice medical appointment reminders and health advice to "godmothers," who act as community relays to follow up with pregnant women in their respective villages. In 26 villages, served by five different primary healthcare centers, MOS@N brings together various stakeholders, including pregnant women, godmothers, rural primary healthcare centers (PHCs), health workers, technicians, and public health researchers.

Keywords: e-health, pregnant women, mobile communication, rural, Burkina Faso, Africa

CONTEXT

According to the World Bank, Burkina Faso had a fertility rate of 5.4 children per woman in 2015, with the infant mortality rate at 53 per thousand in 2016. A case study from the African Strategies for Health (ASH) project highlighted that the maternal mortality rate in Burkina Faso was quite high – at 341 deaths per 100,000 childbirths, 80 percent of which are preventable. Amnesty International considers discrimination in access to adequate and timely sexual and reproductive health care services as the main reason for these deaths.

Under a subsidy policy, 80 percent of the cost of delivery has been subsidized for women in Burkina Faso, or even offered for free, with the costs covered for prenatal visits and transportation for labor. These benefits, however, have not been widely publicized. Poverty and the geographic divide further discriminate women from receiving adequate care. Additionally, the distant health facilities and shortage of staff and supplies also pose serious challenges for pregnant women and their families.

The literacy rate among adults in Burkina Faso was 35 percent in 2014, and only 26 percent among women, according to the World Bank. Little is known about the country's digital literacy rates and digital use, although a recent World Bank report noted that there are now more mobile phones than toilets in Africa. Nevertheless, improved access to information and healthcare services are real challenges for Burkina Faso just like other developing countries. The Burkina Faso Ministry of Health (MOH) introduced the national Maternal Death Surveillance and Response (MDSR) system and guidelines in 2012 to reduce maternal mortality and improve the timely report of maternal deaths. Other nonprofits, such as Family Care International, have been active in strengthening the grassroots organizations and training social workers as well as villagers to raise awareness of maternal health care and improve maternal service delivery.

Burkina Faso			
Population (UN, 2015)	17,914,625	**Fixed broadband subscriptions (%) (ITU, 2016)**	0.05
Population density (people per sq.km) (UN, 2015)	65.38	**Mobile cellular subscriptions (%) (ITU, 2016)**	83.63
Median household income (Gallup, 2006-2012)	US$ 1,530	**Individuals using the Internet (%) (ITU, 2016)**	14
Education (Mean years of schooling) (UNDP, 2013)	Male: 1.1 Female: 1.9	**Individuals using the Internet by Gender (%) (ITU, 2016)**	N/A

PROJECT DESCRIPTION

MOS@N, an experimental mobile health (mHealth) network that provides medical monitoring and follow-up of pregnant women, was implemented in 2013 in response to a critical situation for the health of mothers and infants as well as PLHIV in the Nouna district of Burkina Faso. MOS@N, a fusion of the words "mobile" and "santé" (health in French), operates in an area where maternal mortality remains a major public health challenge, and where the rates of antenatal care consultation attendance and assisted delivery are relatively low.

"Marraines" (godmothers) have become central players in health education and mobilization – roles previously played by male community health workers. They are older women chosen by village leaders to accompany women through their pregnancy and childbirth, who act as intermediaries between their community and health workers. MOS@N has also empowered women to make decisions about their health and that of their children. These accomplishments reflect strong community engagement in the project.

The godmothers have been equipped with bicycles and mobile phones to facilitate their movement within the village as they travel to the local Primary Health Centers (PHCs. The mobile phone contains pre-recorded health education messages for godmothers to play when convening maternal health awareness sessions. Equipped with phones and data connectivity, godmothers can reach remote populations to provide them with health advice and information.

MOS@N also includes an electronic health record system at PHCs. Since none of the local PHCs are connected to the electricity grid, they were also provided solar panels to power the computers for maintenance of records. Five clinics have been equipped with an interactive voice server for awareness-raising and appointment reminders, staff with laptops with a patient monitoring platform installed; and mobile telecommunications resources to reach out to community stakeholders with their own phones in order to make sure that communities have access to adequate, affordable, and fair healthcare services.

Health workers, nurses, and midwives at PHCs are in charge of entering patient data into the system, which then automatically generates the reminders sent to the godmothers' phones. The solution places a greater emphasis on community engagement to deliver treatments, monitor patients within the community, deliver awareness-raising messages, and reminders using mobile telecommunications. The community's role has been consolidated, unlike in the traditional healthcare system where only healthcare professionals perform this role. The project serves 26 villages across five health facilities. Godmothers were at the heart of the work, with 52 recruited to raise the awareness of mothers and to encourage them to seek healthcare. Ten other health workers were entrusted with HIV follow-up as well. The MOS@N network also includes 50 health officers and 38 resource persons.

The project was implemented by the Centre de Recherche en Santé de Nouna (CRSN), a national health research center, and funded by Canada's International Development Research Centre (IDRC) and the Ministry of Health.

Project details			
Technology	mHealth application	**Training**	Mobile phone use for godmothers
Year program started	2013 (-2017 pilot)	**Cost to users**	Free
Geography	Nouna district – 26 villages	**Total cost of program**	200 million West African CFA Francs (US$ 362,000)
User profile	Pregnant women, mothers of infants, godmothers, and people living with HIV	**Associated organizations**	CRSN, IDRC, Ministry of Health, National Health Research Center

PROGRESS AND RESULTS

Since its launch, the project has served 1,330 users per year, with a total of 3,989 beneficiaries. Ongoing training during monthly monitoring visits helped hone health workers' technical skills in using the system and in understanding message content. In all, more than 90 health workers and 62 community members were trained.

The introduction of mHealth services was warmly welcomed at all levels, from the local community to the central Ministry of Health. The project had to overcome the major social challenges, especially around social stigma. Women do not have decision-making power about many issues in their family, including healthcare. The strategy was to foster education and communication at all levels: in the home, between spouses, in villages, in health centers, and in community health associations. The participation of husbands was also sought to implement the project. The project has enhanced the status of women health workers by overcoming deep-seated gender biases.

Providing godmothers with mobile phones and bicycles helped raise their social, economic, and professional status in the community. Mobile phone ownership, accompaniment, and health education sessions have brought godmothers considerable social recognition too by changing the way they are perceived. Some are called "doctors," or are given small presents. It also increased their ability to make decisions within their own homes. Due to their recruitment and training, they were able to assume activities such as vaccination promotion that was previously conducted by male health workers. As a result, godmothers and the women they serve are now empowered to make decisions about their health and that of their children.

MOS@N has generated measurable public health outcomes showing significant improvement in antenatal attendance and assisted delivery rates in participating villages. The numbers testify to the project's success in strengthening the health system and improving access to care. By the end of 2016, 2,161 pregnant women had received prenatal care. Assisted childbirths increased by 50 percent to 97.5 percent. Close to 260 patients living with HIV had been tracked by health workers and the dropout rate was low – only 1.6 percent of cases.

MOS@N also increased equity and participation in health governance. Women were central to the project's implementation, and helped determine the maternal and child health services offered. Stronger direct contacts with the health centers and ready access to information will help them maintain the gains made.

CHALLENGES

Lack of consistent access– The main challenge of the project was unreliable and poor connectivity. Rural villages in Nouna did not have the cellular access or connectivity anticipated, and the lack of allied infrastructure in terms of power hampered effectiveness.

Poor road conditions – Nouna suffers from a severe rainy season during which roads become largely impassable. People were obliged to leave their motos and walk, and forced to pay transportation costs to take a canoe. This hindered the mobility of godmothers and the women they serve and required innovative solutions to bridge the gaps in the health program MOS@N implemented.

Overworked health professionals –The MOS@N system relies on health professionals to collate and input all of the data generated by the godmothers. Health workers sometimes lack time to enter health data into the computer, and compromise monitoring efforts. Additionally, godmothers generally do not receive the automatic reminders on time due to poor connectivity. They may spend hours on the road every day depending on where they live.

Gender barriers – Many women in the area have limited access to mobile phones, and in many cases, husbands, or other members of the family have a phone, but women are given very little opportunity to use it. Deep-rooted paternalistic social values in the community also lead many men to forbid their wives to "waste their time" at the health center when they could be working in the fields. Godmothers themselves mentioned that their mHealth duties could be a source of conflict within the household. To avoid disagreements, only women whose husbands had consented were selected. Community women were also given the choice of listing or not listing their phone number in the system to receive calls.

Social hierarchies –Godmothers were often resented because in these communities there is privacy and secrecy about the pregnancy. Women are afraid that their babies will be bewitched. Godmothers were, for instance, accused of revealing confidential information. The confidential nature of pregnancy, the age of godmothers (in some cases younger than the women they follow), jealousy over the choice of the godmother (and her stipend and equipment), and health complications may all contribute to social tensions.

HIV Stigma – The fear of stigma and rejection caused HIV-positive patients to migrate from village to village, making monitoring of these patients incredibly challenging.

Lack of access to health facilities and devices – Obstacles to accessing maternal care include distance to health centers, shortages of skilled health staff, lack of information on sexual and reproductive health, and the high costs of medical treatments. Health information provided to pregnant women and health providers is often not delivered at the right time or is not up-to-date, and women often live between 5 and 10 kilometers from the nearest centers. Further, access to mobile devices was also at times challenging, as these devices were not as portable and could not be easily used while traversing difficult terrain.

MOS@AN'S SUGGESTIONS FOR FUTURE PROJECTS

mHealth initiatives must be designed in ways that are bottom-up –Successful initiatives require working with on the ground social conditions, understanding extant social roles that are obstacles to health care provision as well as extant social roles that can be translated into facilitating access. MOS@N radically transformed over the course of the project. For instance, the role of godmothers changed over time and the technology used changed vastly.

Implementing mobile health project requires close monitoring and adaptation – MOS@N shows how complex and multi-layered the appropriation of mHealth projects can be. The projects may not develop as intended, and therefore the project team should monitor what is working and what is not and be able to revise the project in ways that would better address the needs of the community it is serving.

Old-fashioned technologies can supplement or replace new technologies, especially with a poor infrastructure – One example is that where infrastructure is lacking, empowering community members to serve as information conduits can be extremely effective. Other than that, ICTs combined with "old-fashioned" technologies like bicycles can cover ground that is too remote or expensive to support through other means. Finally, solar recharging systems were installed in health centers and provided to community health workers to counter the erratic electricity supply. When the Internet could not be accessed, data was stored on thumb drives and later uploaded into the central server at project headquarters.

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