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RESEARCH ARTICLE



Health at her fingertips: development, gender and empowering mobile technologies

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ABSTRACT

This paper examines ‘mobile health’ or ‘mHealth’ programs that are using mobile phones to improve maternal health in the developing world. Whereas its implementers present mobile health as a neutral, universal, accessible and ‘smart’ empowering technology for women, we will question this empowering effect and analyze how the device transforms gender inequalities on the ground. To this end, we will use empirical data collected on a global mHealth program deployed in Ghana and India. Informed by gender, post-colonial, science and technology studies, we offer a critical analysis of these new devices using mobile phones to ‘empower’ women in the Global South. This multisite analysis highlights the gender gap and male domination in accessing mobile phones in rural India and Ghana. It also reveals how mHealth devices can negate the multifactorial dimension of gender and health inequalities, how these global assemblages are renegotiating local power relations and enhancing gender imbalance and health disparities for women in these villages.

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Mobile health; mHealth; mobile phone; maternal care; mobile technologies; ICT; developing countries; gender

Introduction

In 2015, more than seven billion people were mobile phone users, thus propelling mobile phones ahead of all information and communication technologies (International Telecommunication Union, 2013). Be it Mobile Personal Health Record or confidential clinical data sent via text messages (SMS), these devices are increasingly used to provide ‘better’ health services in a context of reduced health expenditure and of increased involvement of patients. The recent multiplication of mobile health or mHealth worldwide illustrates the overall trend towards the globalization and technologization of biomedicine. The widespread idea that digital technologies improve the quality of care, reduce health disparities and optimize health systems takes shape in a diverse set of technical devices: mHealth, telemedicine, big data, etc. This paper offers a glance at this new field of mHealth through the study of a global maternal mHealth project deployed in Ghana, Africa and in Bihar, India. We will base our analysis on fieldwork conducted in 2014 and 2015, in two districts of Central Ghana and two

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districts of Bihar in India, among 200 women, 50 community health workers and 35 implementers, all involved in the same maternal mobile health project. This paper analyzes more specifically the promise of empowerment offered by mHealth and gender inequalities that these socio-technical devices are revealing and transforming in the everyday lives of women enrolled in such programs.

Mobile health: a 'simply brilliant' innovation

'Using mobile phones to access and relay health information in developing countries is the topic everyone in health and technology is talking about right now. There's a reason for that, of course. It's one of those "simply brilliant" innovations that seems to make perfect sense.[...] Can a cell phone save a life? It's extremely possible.' (Bill & Melinda Gates Foundation blog, published on October 3, 2011).

Access to mobile phones is becoming increasingly common across the globe, and is expanding much faster than access to the Internet (ITU, 2013). mHealth figures are mainly coming from mobile operators and mobile technology providers. They estimated the global market in 2013 between 23,000 and 100,000 apps worldwide, a rather approximate estimation that focuses only on apps that are accessible on the major US-based app stores (mobiThinking, 2014; Pew Research Center, 2012; research2guidance, 2013). Only smartphones can use these kinds of apps. Thus, most of them are not yet reachable for the majority of the developing countries (mobiThinking, 2014). Thereby, most of the projects deployed in poor-resources settings are SMS-based or vocal services, which can be used on a classic handset. Mobile health projects and applications emerged at the beginning of 2000s, and have been popping up in the developing countries for the past five years (Chib, van Velthoven, & Car, 2015). Aware of the growing deployment of mobile technology, international health actors try to better characterize this phenomenon. In 2011, the World Health Organization (WHO) described mHealth as the practice of medicine and public health assisted by mobile technologies, such as mobile phones, patient monitoring monitors, 'personal digital assistants' (PDAs) and other wireless technologies (WHO, 2012). WHO segments mHealth according to a typology of projects that include: communication from individuals to health services (call centres, helplines or hotlines), communication from health services to individuals (appointment or treatment reminders, awareness and mobilization campaigns on health issues) and communication between health professionals (mobile telemedicine, patient monitoring, aid to diagnosis and decision-making).

More than just a phone?

The innovative and transformative component of mHealth constitutes a central argument to promote its spreading: 'Mobile phones and wireless internet end isolation, and will therefore prove to be the most transformative technology of economic development of our time.' (Jeffrey Sachs, 2008 quoted in World Bank, 2012, p. 1). This call for technological change, the future and the promises it conveys, are structuring the field of mHealth, its organization and actors. Actually, innovation studies identified these dynamics as characteristic of innovative devices. In line with the work of Joly

(2013) on the economy of technoscientific promises, or Flichy (2003) on imaginaries of innovation, or Rajan (2012) on promise as a symptom of technoscientific capitalism (Flichy, 2003; Joly, Rip, & Callon, 2013; Rajan, 2012), our analysis brings out a clear ‘promising communication’ at stake in mHealth discourses (Quet, 2012). All those promises contribute to promote the mobile phone as a ‘simply brilliant’ innovation for health. Some of those promises – unrelated to health – are fed by the general hopes and hypes associated with the mobile phone. According to the promoters of mHealth, ubiquity and accessibility of mobile phones allow everybody to be easily connected with anybody, anywhere at anytime making this technology omnipotent and universal at the same time. Moreover, according to several UN agencies and international organizations, cell phones are central for the economic growth of developing countries: ‘Studies have suggested that increased mobile ownership is linked to higher economic growth. It is also likely to have twice as large an impact on economic growth in developing countries as in developed ones because the starting point of infrastructure in poorer countries is so much lower in terms of landlines and broadband access.’ (UNDP, 2012, p. 10). These devices also serve as substitutes for many useful tools that you could hardly find in the poorest countries: ‘In developing countries mobile phones not only complement other technologies but also substitute for them – for example, as cameras, debit cards, or voice recorders.’ (World Bank, 2012, p. 4). In addition to those ‘mobile promises’, promises linked to the health sector are swelling the whole promising tendency of those discourses: ‘The use of mobile and wireless technologies to support the achievement of health objectives (mHealth) has the potential to transform the face of health service delivery across the globe.’ (WHO, 2012, p. 9).

More than just healthcare?

Three major promises – effectiveness, cost efficiency and empowerment – are constantly used to promote mHealth: ‘Mobile applications can lower costs and improve the quality of healthcare as well as shift behavior to strengthen prevention, all of which can improve health outcomes over the long term’ (World Bank, 2011, p. 9). These three promises are core of mHealth. They give content and credit to this new field, but also expectations that might not be fulfilled or dreams that won’t come true.

The effectiveness of healthcare and health workers is improved thanks to mobile and digital health data. Instantly updated data collected on site facilitate emergency and crisis management (Callaway et al., 2012; Case, Morrison, & Vuylsteke, 2012; Massey & Gao, 2010). Mobile apps can improve the quality and accuracy of diagnosis by compiling ‘good practices’, international protocols, analysis of personal health records, and offering personalized treatments in accordance with those indicators (Alepis & Lambrinidis, 2013; Yu, Li, & Liu, 2013). mHealth can reach the patient wherever he or she is, even if there are no health facilities around. In developed countries, isolated patients can call and exchange health data directly with health professionals through mobile apps (Sankaranarayanan & Sallach, 2013). This new connectivity can emerge even without mobile phones, through community health workers sent to the isolated communities to collect health data via mobile, evaluate the needs and connect those populations instantly with health facilities (Källander et al., 2013; Mahmud, Rodriguez, & Nesbit, 2010). Moreover, mHealth is also presented as a low-cost mean of

health expenses rationalization and even a way of downsizing health expenditure. According to its promoters, mHealth reduces health costs, by optimizing medical time, by avoiding unnecessary hospitalizations, redundant exams or superfluous medicines, by preventing missed appointments or interruption of treatment. Furthermore, mHealth combined with mBanking will ensure a security of out-of-pocket payments even if patients don't have any bank accounts, and will allow uninsured patients to apply for micro-insurance schemes to cover their health expenses (mHealth Alliance, 2012; mHealth Alliance & World Economic Forum, 2011; World Bank, 2012).

Finally, the promise of 'empowerment' is crucial as it's the only 'human' or 'patient-centred' justification of these devices, the only one involving individuals and not only the optimization of healthcare services. Far from its original meaning – a grassroots acquisition of power or reinforcement of power – empowerment in the case of mHealth is mainly reduced to a relative autonomy or a limited accountability of patients (Sardenberg, 2008; Calvès, 2009). This promise echoes the individualistic and liberal vision of empowerment adopted by international aid agencies at the beginning of 2000 and described by several scholars:

Initially, the term was most commonly associated with alternative approaches to development, with their concern for local, grassroots community-based movements and initiatives, and their growing disenchantment with mainstream, top-down approaches to development. More recently, empowerment has been adopted by mainstream development agencies as well, albeit more to improve productivity within the status quo than to foster social transformation. Empowerment has thus become a 'motherhood' term, comfortable and unquestionable, something very different institutions and practices seem to be able to agree on. (Parpart et al., 2003, p. 24).

The empowering effect of mHealth entitles the idea of an increased degree of autonomy for patients from the healthcare system and also the vision of shared accountability. Thus, health cannot be fully delegated to health professionals; patients have to shoulder their share of responsibility too. For mHealth promoters, mobile phones play a key role in this empowerment through the optimization of prevention and treatments. First, easy access to health information *via* mobile will lead to healthy behaviours. By improving the understanding of preventive actions, risky behaviours will be avoided and healthier ones adopted. These 'positive health-seeking behaviours' will improve the health of whole populations in the long run. Second, a better understanding of treatments will help to follow medical instructions and prescriptions. Studies have already been conducted on treatment adherence for chronic diseases in western countries to show that alerts, reminders and follow-up through the mobile phone helps people to follow instructions and treatments (Cocosila & Archer, 2005; Lester et al., 2010; Stoner & Hendershot, 2012), thus the 'empowered chronic patient' doesn't have to go to the health facility so often and is more in charge of his/her own health.

Closer to a liberal than a liberating vision of empowerment, the technological empowerment of mHealth maximizes individual interest and will thus ensure the efficiency of healthcare. Maternal mHealth projects deployed in the developing world constitute fascinating illustrations of this techno-liberal vision of empowerment. We will now introduce the project we selected for an indepth study of mHealth in development contexts.

Studying the 'most promising mHealth project'

Sub-Saharan Africa and South Asia have in common the highest mobile phone and mobile Internet growth rate worldwide, a 40% increase in 2013, twice the rate of the rest of the world (ITU, 2013, 2014). But these two regions still remain places where people have the shortest life expectancy at birth, the highest infant and maternal mortality rates and the worst indicators related to the different millennium development goals fixed by the United Nations (UNICEF, World Bank, & WHO, 2013; WHO, 2013). The idea that the growing phenomenon of mobile phones could lead to a better health situation for Africans and South Asians rose and took shape in more and more mHealth projects in these regions. To better understand this phenomenon, we did fieldwork in Ghana and India in 2014 and 2015 to study several mHealth projects and among them the 'most promising mHealth project', called Motech:

The most promising mHealth project that I have seen, called Motech, focuses on maternal and child health in Ghana. Community health workers with phones visit villages and submit digital forms with vital information about newly pregnant women. The system then sends health messages to the expectant mothers, such as weekly reminders about good pre-natal care. The system also sends data to the health ministry, giving policymakers an accurate and detailed picture of health conditions in the country. Those working on AIDS, tuberculosis, malaria, family planning, nutrition, and other global health issues can use the same platform, so that all parts of a country's health system are sharing information and responding appropriately in real-time. This is the dream, but it works only if frontline workers are inputting data, health ministries are acting on it, and patients are using the information that they receive on their phones. (Bill Gates in 'The Optimist's Timeline' 31.12.2012 on livemint.com).

The Mobile Technology for Community Health (Motech) project was launched in 2010 in Ghana by the Grameen Foundation with the financial support of the Bill and Melinda Gates Foundation. The goal of Motech is to improve Maternal, Newborn and Child Health outcomes in rural developing contexts by supporting women during their pregnancy and until the first year of newborns. This project combines modules of health information for women and health professionals, identification and tracking of patients, collection and processing of health data, SMS alerts and voice messages. The aim of Motech is to become a global platform used worldwide for different health issues, to sustain and increase the quality and accessibility of health information and care. The Motech project was then launched in India (Bihar State) in 2012 based on the Ghanaian experience. In this paper, we are presenting part of our analysis on the Ghanaian and the Bihar experiments of Motech, the 'direct to consumer' part of the project called *Mobile Midwife* in Ghana and *Kilkari* in India.

In Ghana, the project started in 2010 and finished at the end of 2014. It was active in seven of the approximately 200 districts of Ghana in August 2014. About 30,000 women had been registered since 2010 and among them 9000 in central region, in Gomoa, where we conducted our fieldwork. The project includes implementation of two interrelated services using mobile phones. *Mobile Midwife*, a health information messaging services for pregnant women and lactating mothers, and a Client Data Application, the *Nurse Application*, a data management system for community health workers (Grameen Foundation Ghana, 2012). The aim of the *Mobile Midwife* application is to provide maternal health information for pregnant women, mothers with children

younger than 12 months and their families. Women can sign up for the free mobile phone based service, which sends text or voice message in one of the multiple regional languages with time-specific health information. The weekly messages encourage pregnant women to seek antenatal and postnatal care. In the first year of the child, the messages continue with health information regarding the mother and child, such as family planning and alerts for immunization.

Kilkari is the Indian version of *Mobile Midwife*. Launched in Bihar in 2013, it is part of a bigger project called *Ananya* that encloses three mHealth applications. It was first launched in eight districts of Bihar and extended to 20 districts afterwards. 100,000 subscriptions have been registered since 2013. We did our fieldwork in two of the eight pilot districts where subscriptions to *Kilkari* were the highest. *Kilkari* is the only mobile application of *Ananya* program that is directly targeting pregnant women. Like *Mobile Midwife* in Ghana, *Kilkari* is a vocal messaging system, which provides maternal health information for pregnant women and mothers with children younger than 12 months. Running on the same Motech platform, the weekly messages advise the women on how to carry out their pregnancy and also encourage women to seek antenatal and postnatal care. It's a fee-based mobile phone service, which sends time-specific voice messages in 'rural Hindi'. The service costs 1 rupee per message.

Methods, fieldwork and context of the research

To conduct our analysis on mHealth, we first did a qualitative discourse analysis of four textual corpuses, with the help of Factiva software. The first Factiva corpus called 'Worldwide general press', comprised 446 articles published between 2011 and 2013, in English and French, with 'mobile AND health' as central topic. The second Factiva corpus called 'Techno and Health specialized press' focused only on the four most evoked regions in the general press (Africa, India, UK and USA) and comprised 581 articles published between 2011 and 2013 in specialized techno and health press with 'mobile AND health' as the central topic. The third corpus called 'Scientific Press' was realized with PubMed, and comprised 213 articles published between 2010 and 2014 with 'mobile AND health' as central topic. The fourth corpus called 'International Reports' comprised almost 20 reports from international and UN agencies (UN, EU, World Bank, WHO, PNUD, UIT, UNICEF, OCDE, US FDA, Indian Government, Institute for Healthcare Informatics) published between 2010 and 2014 on information and communication technologies (ICTs) for development or on mHealth and also 50 reports from the GSM Association and 20 from the mHealth Alliance, the two major international organizations that promote mHealth worldwide.

After this primary corpus analysis, we conducted an empirical qualitative study in Ghana (Central Region) and India (Bihar state) where the Motech project was deployed. In Ghana, we went with a research team from the School of Public Health (University of Ghana) to Central Ghana – the region with the highest rate of enrolment to Motech – 10 focus groups of women were organized in two districts, where we met 100 women. We also interviewed 20 health workers involved in the mHealth program, and 15 implementers. In Bihar, we went to two of the eight pilot districts of the project (called innovative districts by the implementers). We chose the two districts where the subscriptions rates to the service were the highest in the State. We met 20

implementers of Motech in Delhi, and in the two selected districts, we met the managers of the primary health centres of the blocks that connected us with the facilitators of the community health workers. We then organized focus groups with community health workers involved in the service and with their help, organized focus groups with women in 13 villages. We met 99 women and 30 community health workers in Bihar. All the interviews were conducted in local language (Fanté in Ghana and Hindi in Bihar) and were fully transcribed in English and imported in nVivo software along with the field notes to conduct a qualitative analysis. We used a two-step coding method: a first round of descriptive thematic coding and then a second round of analytic coding related to our research questions.

Questioning Motech's empowering effect

Motech proponents outline the device as an empowering tool for women, a promising discourse taken up by local and international media: *'Mobile Midwife' Empowers Ghanaian Women* (International Reporting Project, 2013; NextBillion.net, 2013). We would like to study this proposal of empowerment more specifically to see how it resonates with the perceptions of the different stakeholders and end-users of the device on the ground.

Like many other mHealth projects targeting women, Motech leans on a double promise of empowerment: 'Patient empowerment' and 'Women empowerment'. Empowerment for Motech relies on the idea that easy access to health information through the mobile phones will educate women and help them to adopt 'proper' health behaviours. In fact, this promise is based on the 'knowledge deficit model' (Wynne & Irwin, 1996). It posits that some actors (women here or farmers for Wynne & Irwin) don't have sufficient knowledge to make good decisions or adopt appropriate behaviours whereas experts (here doctors) can make informed choices. Both in India and Ghana, women are presented as 'ignorant' and Motech offers to make up for this deficit of knowledge. Motech's proponents advocate that Motech clients are more aware and now understand what is good for their pregnancy and baby's health, as one of the implementer of Motech in Ghana suggests here:

Most of the women were ignorant of most things that happened during the pregnancy, about what to do and what to eat, what they must do and when they have to go to hospitals. The end survey tells us that they are really impressed with the education that was given to them, so right now they know a lot about what is good. (ITW with G., Grameen F., Ghana, 06/14).

Implementers of Motech in Ghana and India highlight that the aim of Motech is not simply to transmit knowledge; the device has to help women to separate the wheat from the chaff, meaning dispelling local myths and promoting medical knowledge:

'Because we want to create demand, so we create media that can help inform people and educate them to demand not what's just available but what is a healthy behaviour and what practice should be there around the behaviour.' (ITW with A, BBC, Delhi, India 03/15).

In order to change those behaviours the device also has to debunk the myths spawned by local customs:

'On child and maternal health, there are many myths prevalent about early initiation of breast feeding and exclusive breast-feeding. [...] So there are a number of behaviors that need to be improved, but in improving those behaviors, the social culture norms become barriers.' (ITW with H, BBC, Delhi, 08/15).

To understand how Motech intends to change behaviour, we worked on the messages sent to women and how they try to educate them. These two messages, for instance, are clearly structured to debunk myths and to reinsure medical wisdom:

'Evil eye does not cause problems with your pregnancy, problems are medical that can happen to any pregnant woman, and can be addressed by health professionals' (Primary Message, Pregnancy Week 8); 'You may have been told eating eggs will make your baby too big, or that eating snails will make your baby drool, but there is no medical proof of this.' (Primary Message, Pregnancy Week 18).

Thus, these messages suggest one's health will improve as long as one follows the instructions of the device. This injunction doesn't really look like a gain of power or autonomy but more like a top-down prescription. A top-down pressure that was reported and criticized by many women we met in Ghana and India. We will develop this analysis in the third part of the paper.

Findings and discussion

This final part of the paper presents our results, starting with the accessibility of Motech messages, their reception and interpretation by women enrolled in the program. Finally, we will discuss our findings regarding the alleged empowering effect of Motech.

Receiving the message

To be able to receive Motech messages, first you need to have access to a mobile phone. Several science and technology scholars have clearly shown that access to ICTs is harder for women, because they don't have free access to hardware – computers or mobile phones are owned by the husband – (Wyatt, 2010), but also because these technologies are conceptualized, developed and deployed by men (Henwood & Wyatt, 2000; Gurumurthy, 2004). Among ICTs, mobile phones are particularly interesting, because gender inequalities are less emphasized. Because mobile phones are cheaper and easier to use than computers or the Internet, they seem to be a more 'egalitarian' technology (ITU et UNESCO, 2013). Yet, a woman is still 14% less likely to own a mobile phone than a man in the Global South. This figure increases to 38% if she lives in South Asia and even higher in rural and poor areas (GSMA, 2013). So access to mobile phones is playing an important role in mHealth projects targeting women and our fieldwork gave us a lot of material on this. The Bihar experiment particularly magnifies gender inequalities and male domination, the Ghanaian situation is less imbalanced but still has exactly the same gender issues as in India. Several recent studies on South Asia (Handapangoda & Kumara, 2013; Zainudeen, Iqbal, & Samarajiva, 2010) and Sub-Saharan Africa (Murphy & Priebe, 2011) confirm our observations concerning gender inequalities associated with mobile phones.

When Motech was launched in 2010, only 1.8% of women in the Upper East Region of Ghana – where Motech was first piloted – owned a phone (UN & Ghana Statistical Service, 2013, p. 113). Then, mobile phone accessibility was a major issue for implementers of the program:

We realized that most of the women didn't have their own phone, they had to rely on a neighbor phone or husband phone. That affects the project and also, most of the women were not educated so they cannot use the mobile phone application themselves, sometimes a nurse will access the message and make the woman listen to it. (ITW with E., Former Motech Staff, Ghana, 06/14).

In four years, the situation has changed a lot, and in 2014 Ghana reached a mobile phone penetration rate of more than 100%, but accessing mobile phone remains an issue for women in rural Ghana. In rural India, where the mobile phone penetration rate is around 48% (TRAI, 2015), accessing mobile phones is even more difficult for women, not only because the overall penetration rate is lower but also because the gender gap is wider. A woman in Sub-Saharan Africa is 13% less likely to own a phone than a man and this figure rises to 43% in South Asia. Half of the women we met in Bihar and almost 80% of the women we met in Central Ghana had their own phone. But these women are over-represented in our study compared to the general population, because they are the ones targeted on priority to subscribe to Motech; a bias confirmed by the community health workers in charge of subscribing women to Motech:

'We do not subscribe in places where the woman does not have a mobile of her own.' (ITW with HWFGD01, Patna, India, 09/15).

So accessing mobile phone is still a very important issue for women in rural Ghana or India, as one participant described:

Someone like me if I say I do not have a phone who would believe me? But there are some people that when you seek they do not have phones. There are some that have phones but the phones have faults so but they do not have money to repair the phone and that is sometimes when it (calls) comes through it cuts. (FG3, Apam, Ghana, 06/14)

Women are still relying on men to access this technology, as other women participants explained in Ghana as well as in India: 'Her husband owns the phone sometimes the husband receives the messages and when he comes to the house he communicates it to her. Sometimes, not always.' (FG1, Apam, Ghana, 06/14); 'There when I was with my husband, he kept the mobile with him, here at my mother's home, my brother keeps it' (BFGD01, Patna, India, 09/15).

And using the mobile phone for women is often related to male authority and domination:

'I do not touch the mobile. He (husband) says that I don't know how to operate it, I may spoil it and it may stop working.' (BFGD07, Samastipur, India, 09/15).

Indeed, some women express inequalities that the mHealth program entails and think that using a mobile phone adds difficulties in accessing health information:

'So if you do not have money to go to the hospital it means you do not get any health messages, because you didn't register, and it is not everybody who owns a phone that will have access to Motech messages.' (FG2, Apam, Ghana, 06/14).

The Indian case is even worse because the service costs one rupee for each message, so it enhances financial distress that women are already experiencing to access health information. The service also creates conflicts between men and women because of these fees, as explained by these women:

'My brother told that lot of money gets deducted, so he deactivated it. He said he would not give me the mobile anymore.' (BFGD01, Patna, India, 09/15) 'My husband said that it's not necessary to listen to it and money gets deducted. He wasn't ready to understand when I tried to convince him.' (BFGD01, Patna, India, 09/15).

Thus, Maternal mHealth projects, like Motech, are the site of amplified gender divisions. Indeed, maternal health in those projects is relying almost exclusively on women whereas access to technologies is still a male prerogative. Thus, addressing maternal health messages *via* mobile raises a lot of gender issues and relays inequalities linked to gendered access and uses of a technical device.

Many scholars working on uses of technologies have shown that the perfect inscription of real uses of a device in the initial scenario envisioned by its developers is rare, not to say impossible (Akrich, 1991; Bijker, 1997; Bijker & Law, 1992; Kline & Pinch, 1996; Oudshoorn & Pinch, 2003). Endorsement, indifference, critique or rejection of these devices take an active part in the socio-technical change involved by innovative artifacts. It is then fundamental to take into account and analyze those frictions and the counter-proposals and 'anti-programs' offered and implemented by the effective users of these devices (Akrich, 2010; Bijker & Law, 1992; Tsing, 2005). In the coming analysis, we will put aside the questionable accessibility of the program, the technical issues and malfunctions and will focus only on the acceptance of the information transmitted by Motech that constitutes the mainstay of its alleged empowering effect.

Frictions and critics

In the villages, there are numerous frictions and resistances related to the reception and acceptance of Motech messages. First of all, women are not always enrolled in Motech on a voluntary basis and are enlisted in a relatively imperious apparatus, as described by these Ghanaian women:

'When I went for ANC services, I was told to come and when I went I was actually registered to Motech before it was explained to me the benefits of Motech' (FG1, Apam, Ghana, 06/14); 'They took my details and where I live, and my phone number. And they told me that they would be calling me to check on me, if my baby is lying in the right position. So they told me that when they call me I have to be able to pick up and listen to what they are saying.' (FG4, Apam, Ghana, 06/14).

If empowerment is supposed to rely on free will and autonomy, this top-down almost compulsory device doesn't really make room for autonomy. In the Indian case, the pressure of the program is even higher since women have to pay for each message, a cost that they sometimes discover after being subscribed to the service by community health workers, as explained by this woman and many other participants:

'I was not told that money would get deducted for the calls.' (BFGD11, Samastipur, India, 10/15).

Second, women enrolled in Motech showed us that the link between ‘receiving a message’ and ‘changing behaviours’ was not evidenced at all. Several women talked about messages they voluntarily not followed because they didn’t see the point or because it went against their own experience or local knowledge, as detailed by several participants in Ghana:

‘I was told not to give my child water until the sixth month, I do not follow it. My mother would tell you that when she gave birth to me and I was given water and I am fine! So why should I not give my child water?’ (FG4, Apam, Ghana, 06/14); ‘They tell us not to purge but we do not follow that instruction because we believe that purging is good. And that our parents told us that when the child is about eight or nine months there are certain herbs that help the child to be strong so I purge with them.’ (FG3, Apam, Ghana 06/14); ‘Usually our health information comes from elder women within the community, since they have been through childbirth before. They have an experience, so they advise you on what to do, how to take care of yourself and things you should not do that will help to keep your baby safe.’ (FG1, Apam, Ghana, 06/14).

Women respect and foster local and family knowledge because it comes from their own mothers and older women from their family and community. That way, it seems hard to envision that one vocal message of less than two minutes once in a week could disprove and outlaw traditional knowledge and know-how. Several scholars have studied the knowledge mobilized during pregnancy by women in developing countries. They reiterate the importance of taking into account and integrating local knowledge rather than debunking it rapidly, which represents an additional violence towards women (Hancart Petitot, 2008); violence that women perceive and relay by criticizing the device and highlighting its limitations.

Indeed, several interviewees – in Ghana as well as in India – expressed their dissatisfaction with the inability to communicate with the Motech system and issuers of the messages:

‘I do not like the fact that when they call I am not able to speak back to them. It is like they only insist on what they have to say, when I say anything they do not hear. (FG3, Apam, Ghana, 06/14); ‘You could only listen to it and not speak anything, it’s an issue’. (FG2, Patna, India, 09/15).

Several women explain that they would need to be shown how to take care of the baby; they have specific health needs that a generic message cannot satisfy:

‘If there is a dialogue and people can speak from both the sides, it would be better. If it was a real doctor or a person sitting on the other side talking, it would be better. This way we could also talk to them and ask our doubts » (FG2, Patna, India, 09/15); ‘At times you want to talk to the person, so that the person can respond to your questions and then you also receive answers from the person. Sometimes you have a difficult situation, but you calling the person tell them this is what happening for me. The person will give you the rationale for how to go by that sickness.’ (FG5, Apam, Ghana, 06/14).

Sending automated generic health messages does not promote communication between professionals and beneficiaries, it generates questions and requests that the device does not support. This automation and ‘depersonalization’ of care can even produce the opposite effects from those expected by the promoters of mHealth: reduce caregiver-patient interactions and loosen the link with the health system.

Problematic side effects

Motech messages are sometimes prescribing actions that can be impossible to implement for women, but the system has no feedback process to take those barriers into account. A female vegetable vendor in rural Ghana will not follow a message telling her to go to her antenatal consultation on a market day, because her income depends on it. In a similar vein, exclusive breastfeeding advocacy without any follow-up can be useless, because many women are experiencing erratic and/or painful milk flows, as this woman explained:

'Sometimes one week after I deliver there is no milk in my breasts. Sometimes three, four days there is still no milk coming, so I am tempted to give my child food'. (FG4, Apam, Ghana, 06/14).

Not taking into account the voice and needs of the women targeted by the device, not offering any dialog seems incompatible with the original idea of empowerment. This device constitutes a supplementary form of authority that women are not allowed to question. Thus, to envision strengthening healthcare seeking behaviours and reinforcing the caregiver–patient relationship without any dialog or interpersonal connection seems counter-intuitive and will prove to be counterproductive on the ground. Indeed, women are often reporting conflicting relationship with health professionals, and even verbal or physical violence. Some explain that receiving messages keeps them from going to the health centre:

'It's been helpful receiving the messages from the phone, that way you don't have an encounter with anybody.' (FG1, Apam, Ghana, 06/14); 'A message sent through the phone helps better than going to the clinic.' (FG2, Apam, Ghana, 06/14).

Motech becomes a substitute for care, a way to avoid the encounter with health professionals. More than gaining autonomy, Motech can become a way to opt out of the health system.

Other women express the gap between Motech messages and their difficulties in accessing health facilities. In India as well as in Ghana, the discrepancy between Motech recommendations and the reality of health infrastructures constitutes a major source of frustration for women who feel the uselessness of these messages:

'Whatever is told over the call does not happen in reality, all the facilities are not available. I can't get myself or my child checked up' (FG3, Patna, India, 09/15).

If Motech promotes access to brief health information, it does not address the main barriers to access care in rural Ghana and India. Financial and geographical accessibility of healthcare, conflicting relationship with health workers or with the community, constitute barriers that women in rural Ghana and India have difficulties in overcoming. These are obstacles already identified as the main causes of death for pregnant women (Ronsmans & Graham, 2006; WHO, 2012) and regularly stated by our interviewees as the core reasons for their estrangement from the healthcare system. The lack of affordable means of transport and time of transportation needed to reach any health facility is a major issue in Ghana as well as in Bihar:

'Where I live there is no vehicle available. So when it is time for you to deliver and the vehicle is not there and you will not be able to walk to the facility, you will deliver at

home.’ (FG2, Apam, Ghana 06/14); ‘Transport to the hospital is through a jeep and it charges 500-600 INR (7-8€) to take us to the hospital. Ambulance never comes here’. (FG10, Samastipur, India, 10/15).

Financial accessibility constitutes a central issue for pregnancy follow-ups and institutional deliveries. Women frequently refer to the costs of transportation, medicines, bribes and supplies sought by any health facility for delivery:

‘It all boils down to money matters... I really wish I could go to the hospital to seek care. But I am unable because I do not have money’ (FG5, Apam, Ghana 06/14); ‘I had to spend money on each and everything, medicines, injections, food. The nurse also demanded money saying that I gave birth to a boy.’ (FG7, Samastipur, India, 09/15).

Transportation, quality of care, patient-caregiver relationships, costs and conditions of delivery, constitute crucial barriers to institutional deliveries in Apam (Ghana) as well as in Samastipur (India). Motech messages are encouraging women to attend health facilities and deliver there. But given the multiple geographical and financial difficulties evoked by those women, Motech messages constitute an additional symbolic violence (Bourdieu, 2002) for women who cannot afford institutional delivery but also for women who paid for it and had such a bad experience:

‘It is just that people go to the primary health centre thinking that there are facilities there, which are better than delivering at home. But in fact, there is no benefit from delivering at hospital, and it is too expensive.’ (FG10, Samastipur, 10/15).

Conclusion

Motech messages pretend to be universal and efficient, but by focusing on information delivery, the device sidesteps the complex assemblage of dynamics and determinants of health that compose any given healthcare system. The segmented view of health through technologies, proposed by Motech, dodges social and economic issues rooted in healthcare, it produces what James Ferguson describes about development policies as ‘depolitization’ or ‘antipolitics’ (Ferguson, 1994). Motech is limited to the dissemination of health information and does not allow the creation of a dialog between the health system and its users, the possibility of an interaction that would better identify and address some of the structural barriers to healthcare. The empowerment offered by Motech, far from being liberating and political, is instrumental and individualistic. Motech embodies perfectly the drifting of this term described earlier; a reductionist view of power relations and domination that offers to compensate gender inequalities by sending unquestionable centralized and automated information.

Many discourses present mHealth as a magic bullet to solve the problems of healthcare systems. The study of mHealth projects in Ghana and India enabled us to better understand those artifacts, how they are managed and how they interact with the local healthcare system. The study especially helps us understand how these global programs have difficulties in settling locally and for the long run. The segmented view of health through technologies proposed by these devices constitutes a major concern for its alleged efficiency. The top-down structure, the lack of feedback and interpersonal communication, the negation of multiple barriers to healthcare, raise major

reservations about any empowering effect that mHealth devices like Motech could have on women and health outcomes.

Disclosure statement

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Notes on contributor

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References

- Akrich, M. (1991). De la sociologie des techniques à une sociologie des usages. *Techniques Et Culture*, 16, 83–110.
- Akrich, M. (2010). Comment décrire les objets techniques? *Techniques & Culture. Revue Semestrielle D'anthropologie Des Techniques*, 54–55, 205–219. Retrieved from <https://doi.org/10.4000/tc.4999>
- Alepis, E., & Lambrinidis, C. (2013). M-health: Supporting automated diagnosis and electronic health records. *SpringerPlus*, 2, 103. Retrieved from <https://doi.org/10.1186/2193-1801-2-103>
- Bijker, W.E. (1997). *Of bicycles, bakelites, and bulbs: Toward a theory of sociotechnical change*. Cambridge, MA: MIT Press.
- Bijker, W.E., & Law, J. (1992). *Shaping technology/building society: Studies in sociotechnical change*. Cambridge, MA: MIT Press.
- Bourdieu, P. (2002). *La domination masculine (Éd. augm. d'une préface)*. Paris: Ed. du Seuil.
- Callaway, D.W., Peabody, C.R., Hoffman, A., Cote, E., Moulton, S., Baez, A.A., & Nathanson, L. (2012). Disaster mobile health technology: Lessons from Haiti. *Prehospital and Disaster Medicine*, 27, 148–152. Retrieved from <https://doi.org/10.1017/S1049023X12000441>
- Calvès, A.-E. (2009). «Empowerment»: Généalogie d'un concept clé du discours contemporain sur le développement. *Revue Tiers Monde*, 200, 735. Retrieved from <https://doi.org/10.3917/rtm.200.0735>
- Case, T., Morrison, C., & Vuylsteke, A. (2012). The clinical application of mobile technology to disaster medicine. *Prehospital and Disaster Medicine*, 27, 473–480. Retrieved from <https://doi.org/10.1017/S1049023X12001173>
- Chib, A., van Velthoven, M.H., & Car, J. (2015). mHealth adoption in low-resource environments: A review of the use of mobile healthcare in developing countries. *Journal of Health Communication*, 20, 4–34. Retrieved from <https://doi.org/10.1080/10810730.2013.864735>

- Cocosila, M., & Archer, N. (2005). A framework for mobile healthcare answers to chronically ill outpatient non-adherence. *Journal of Innovation in Health Informatics*, 13, 145–152.
- Ferguson, J. (1994). *The anti-politics machine: development, depoliticization, and bureaucratic power in Lesotho*. Minneapolis: University of Minnesota Press.
- Flichy, P. (2003). *L'innovation technique: Récents développements en sciences sociales, vers une nouvelle théorie de l'innovation (Nouv. éd.)*. Paris: La Découverte.
- Grameen Foundation. (2012). MOTECH lessons learned. September 2012.
- GSMA. (2013). Women & mobile: A global opportunity. A study on the mobile phone gender gap in low and middle-income countries. Retrieved from http://www.gsma.com/mobilefordevelopment/wp-content/uploads/2013/01/GSMA_Women_and_Mobile-A_Global_Opportunity.pdf
- Gurumurthy, A. (2004). Combattre les inégalités de genre dans la société d'information. Genre et développement, En Bref, Genre et TIC, no 15 (2004). Retrieved from <http://www.bridge.ids.ac.uk/Docs/enbref15.pdf>
- Hancart Petitot, P. (2008). *Maternités en Inde du Sud: des savoirs autour de la naissance au temps du sida*. Paris: Éd. Edilivre Aparis.
- Handapangoda, W.S., & Kumara, A.S. (2013). The world at her fingertips?: Examining the empowerment potential of mobile phones among poor housewives in Sri Lanka. *Gender, Technology and Development*, 17, 361–385. Retrieved from <https://doi.org/10.1177/0971852413498742>
- Henwood, F., & Wyatt, S. (2000). Persistent inequalities?: Gender and technology in the year 2000. *Feminist Review*, (64), 128–131.
- International Reporting Project. (2013). Mobile midwife empowers Ghanaian women. Retrieved February 5, 2016, from <http://internationalreportingproject.org/stories/view/mobile-midwife-empowers-ghanaian-women>
- International Telecommunication Union (ITU). (2013). The world in 2013: ICT facts and figures. Retrieved from <http://www.itu.int/en/ITU-D/Statistics/Documents/facts/ICTFactsFigures2013.pdf>
- International Telecommunication Union (ITU). (2014). World in 2014: ICT Facts and Figures. Retrieved from <http://www.itu.int/en/ITU-D/Statistics/Documents/facts/ICTFactsFigures2014-e.pdf>
- International Telecommunication Union (ITU). (2016). ICT Facts and Figures in 2016. Retrieved from <http://www.itu.int/en/ITU-D/Statistics/Documents/facts/ICTFactsFigures2016.pdf>
- ITU et UNESCO. (2013). Doubling digital opportunities: Enhancing the inclusion of women and girls in the information society. Genève: UNDP. Retrieved from <http://www.broadbandcommission.org/Documents/working-groups/bb-doubling-digital-2013.pdf>
- Joly, P.-B., Rip, A., & Callon, M. (2013). Réinventer l'innovation? Retrieved from <http://webcom.upmf-grenoble.fr/lodel/innovacs/index.php?id=108#tocto1n3>
- Källander, K., Tibenderana, J.K., Akpogheneta, O.J., Strachan, D.L., Hill, Z., ten Asbroek, A.H.A., ... Meek, S.R. (2013). Mobile health (mHealth) approaches and lessons for increased performance and retention of community health workers in low- and middle-income countries: A review. *Journal of Medical Internet Research*, 15, e17. Retrieved from <https://doi.org/10.2196/jmir.2130>
- Kline, R., & Pinch, T. (1996). Users as agents of technological change: The social construction of the automobile in the rural United States. *Technology and Culture*, 37, 763–795.
- Lester, R.T., Ritvo, P., Mills, E.J., Kariri, A., Karanja, S., Chung, M.H., ... Plummer, F.A. (2010). Effects of a mobile phone short message service on antiretroviral treatment adherence in Kenya (WelTel Kenya1): a randomised trial. *The Lancet*, 376, 1838–1845. Retrieved from [https://doi.org/10.1016/S0140-6736\(10\)61997-6](https://doi.org/10.1016/S0140-6736(10)61997-6)
- Mahmud, N., Rodriguez, J., & Nesbit, J. (2010). A text message-based intervention to bridge the healthcare communication gap in the rural developing world. *Technology and Health Care: Official Journal of the European Society for Engineering and Medicine*, 18, 137–144. <https://doi.org/10.3233/THC-2010-0576>
- Massey, T., & Gao, T. (2010). Mobile Health Systems that optimize resources in emergency response situations. *AMIA Annual Symposium Proceedings, 2010*, 502. Retrieved from <http://www.ncbi.nlm.nih.gov/pmc/articles/PMC3041325/>

- mHealth Alliance. (2012). *Advancing the Dialogue on Mobile Finance and Mobile Health: Country Case Studies*.
- mHealth Alliance & World Economic Forum. (2011). *Amplifying the Impact: Examining the Intersection of Mobile Health and Mobile Finance*.
- mobiThinking. (2014). *Global mobile statistics 2012-2013*. Retrieved from <http://mobithinking.com/mobile-marketing-tools/latest-mobile-stats/a>
- Murphy, L.L., & Priebe, A.E. (2011). "My co-wife can borrow my mobile phone!": gendered Geographies of Cell Phone Usage and Significance for Rural Kenyans. *Gender, Technology and Development*, 15, 1–23. Retrieved from <https://doi.org/10.1177/097185241101500101>
- NextBillion.net. (2013). "Mobile Midwife" Empowers Ghanaian Women. Retrieved December 17, 2013, from <http://nextbillion.net/blogpost.aspx?blogid=3639>
- Oudshoorn, N., & Pinch, T.J. (2003). *How users matter: The co-construction of users and technologies*. Cambridge, Mass: MIT Press.
- Parpart, J.L., Rai, S., & Staudt, K.A. University of Warwick, & Centre for the Study of Globalisation and Regionalisation. (2003). *Rethinking empowerment gender and development in a global/local world*. London; New York: Routledge. Retrieved from <http://public.eblib.com/choice/publicfull-record.aspx?p=171259>
- Pew Research Center. (2012). *Mobile Health 2012*. Retrieved May 8, 2014, from <http://www.pewinternet.org/2012/11/08/mobile-health-2012/>
- Quet, M. (2012). La critique des technologies émergentes face à la communication promettante. *Contestations autour des nanotechnologies. Réseaux*, 173–174, 271. Retrieved from <https://doi.org/10.3917/res.173.0271>
- Rajan, K.S. (2012). *Lively capital: Biotechnologies, ethics, and governance in global markets*. Durham: Duke University Press.
- research2guidance. (2013). *Mobile health Market report 2013-2017*. Retrieved from <http://www.research2guidance.com/shop/index.php/mhealth-report-2>
- Ronsmans, C., & Graham, W.J. (2006). Maternal mortality: who, when, where, and why. *Lancet (London, England)*, 368, 1189–1200. Retrieved from [https://doi.org/10.1016/S0140-6736\(06\)69380-X](https://doi.org/10.1016/S0140-6736(06)69380-X)
- Sankaranarayanan, J., & Sallach, R.E. (2013). Rural patients' access to mobile phones and willingness to receive mobile phone-based pharmacy and other health technology services: A pilot study. *Telemedicine Journal and E-Health: The Official Journal of the American Telemedicine Association*, 20, 182–185. Retrieved from <https://doi.org/10.1089/tmj.2013.0150>
- Sardenberg, C. (2008). Liberal vs. Liberating Empowerment: A Latin American Feminist Perspective on conceptualising women's empowerment. *IDS Bulletin*, 39, 18–27.
- Stoner, S.A., & Hendershot, C.S. (2012). A randomized trial evaluating an mHealth system to monitor and enhance adherence to pharmacotherapy for alcohol use disorders. *Addiction Science & Clinical Practice*, 7, 9. Retrieved from <https://doi.org/10.1186/1940-0640-7-9>
- Tsing, A.L. (2005). *Friction: An ethnography of global connection*. Princeton, NJ: Princeton University Press.
- UN & Ghana Statistical Service. (2013). *Women & men in Ghana-2010 Population and Housing census Report*. Retrieved from http://www.statsghana.gov.gh/docfiles/publications/2010phc_monograph_women_&_men_in_Gh.pdf
- UNDP. (2012). *Mobile Technologies and empowerment: enhancing human development through participation and innovation*. Retrieved from http://www.undpegov.org/sites/undpegov.org/files/undp_mobile_technology_primer.pdf
- UNICEF, World Bank, & WHO. (2013). *Levels & Trends in Child Mortality*. UN Inter-agency Group for Child Mortality Estimation. Retrieved from http://www.childinfo.org/files/Child_Mortality_Report_2013.pdf
- WHO. (2013). *World Health Statistics 2013*. Retrieved from http://www.who.int/gho/publications/world_health_statistics/EN_WHS2013_Part3.pdf?ua=1
- World Bank. (2011). *Mobile applications for the health sector*. Washington: World Bank. Retrieved from [http://siteresources.worldbank.org/INFORMATIONANDCOMMUNICATIONANDTECHNOLOGIES/Resources/mHealth_report_\(Apr_2012\).pdf](http://siteresources.worldbank.org/INFORMATIONANDCOMMUNICATIONANDTECHNOLOGIES/Resources/mHealth_report_(Apr_2012).pdf)

- World Bank. (2012). *Maximizing mobile*. Washington, DC: World Bank: InfoDev.
- World Health Organization, UNICEF, United Nations Fund for Population Activities, & World Bank (WHO). (2012). Trends in maternal mortality: 1990 to 2010: WHO, UNICEF, UNFPA, and The World Bank estimates. Retrieved from <http://www.who.int/reproductivehealth/publications/monitoring/9789241503631/en/>
- Wynne, B., & Irwin, A. (1996). *Misunderstanding science?: The public reconstruction of science and technology*. Cambridge, MA: Cambridge University Press.
- Yu, Y., Li, J., & Liu, J. (2013). M-HELP: A miniaturized total health examination system launched on a mobile phone platform. *Telemedicine Journal and E-Health: The Official Journal of the American Telemedicine Association*, 19, 857–865. Retrieved from <https://doi.org/10.1089/tmj.2013.0031>
- Zainudeen, A., Iqbal, T., & Samarajiva, R. (2010). Who's got the phone? Gender and the use of the telephone at the bottom of the pyramid. *New Media & Society*, 12, 549–566. Retrieved from <https://doi.org/10.1177/1461444809346721>