From Ghana to India, Saving the Global South's Mothers with a Digital Solution

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Abstract: With the widespread use of mobile phones in the Global South, digital tools are attracting growing interest from international aid actors as well as local governments - positioning digital technology as an essential driver of economic growth and an obvious solution to many social problems. Initiated by multiple actors from the digital industry, these programs reconfigure the state, the rights of citizens, the perimeter and access to health services. Through the study of the Motech Global Mobile Health Program (mHealth) implemented in Ghana and India to improve maternal health, this paper explores the way in which processes of medical globalization and privatization come into being through digital technology. It shows how forms of philanthrocapitalism drive such digital programs. By confronting the stories of the techy philanthropists promoting such solutions and the global south's mothers that are supposedly benefiting from it, this article also illustrates the gap between the promise of better healthcare offered by such digital solution and the realities experienced on the ground by its users, on gender and empowerment issues or accessibility and quality of healthcare.

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The story of Bill & Samia

Samia is seven months pregnant and works in the fields close to her house. Her mobile phone rings, she picks up and listens to Dr. Anita who encourages her to go to the hospital for her last antenatal visit. Samia never gave birth at the hospital, but encouraged by the community health worker of her village, she is paying to receive this message. Dr. Anita is a voice recorded on a digital platform and the central character of the Motech Global Health Program implemented by the Bill and Melinda Gates Foundation in partnership with the governments of several developing countries. This story is not a fiction. I met many women in India and Ghana who, like Samia, did not have electricity, running water or toilets in their homes, but had a mobile phone, and thereby became the targets for new policies, using digital technology as a central instrument. This paper is an attempt to make sense of the artifact that ties Bill Gates, Dr Anita and Samia. It focuses on assemblages of people, techniques, institutions that are shaped by dynamics of power in an increasingly digitally mediated world.

With the widespread use of mobile phones in the Global South, digital tools are attracting growing interest from international aid actors as well as local governments - positioning digital technology as an essential driver of economic growth and an obvious solution to many social problems. Initiated by multiple actors from the digital industry, these policies revive old questions about technological development, relations between the market sector and states, and the role of knowledge and techniques in inequalities between North and South. Often undertaken in the name of the fight against corruption or to improve failing public services, these initiatives reconfigure the state, the rights of citizens, the perimeter and access to health services. My reflection started from a triple questioning: Who governs these digital policies? How do they transform institutions and individual practices? How are they received, ignored or challenged by people, who are supposed to "benefit" from them ? I propose to analyze the way in which the digital constitutes a socio-technical device that organizes specific social

relations between public health programs, its recipients and a third party which becomes unavoidable: digital technology providers. In this article, the mobile application used by Samia (Motech) will be the main site of analysis, wether it is used in Bihar (India) or in Ghana. Through the study of this Mobile Health (mHealth) program aimed at improving maternal health in Western Africa and South Asia, this paper explores the way in which processes of medical globalization and privatization come into being through digital technology. It shows how forms of philanthrocapitalism drive such digital programs. It also illustrates the gap between the promise of better healthcare offered by such digital solution and the realities experienced on the ground by its users; by confronting the stories of "Bill" that epitomizes the techy philanthropists promoting digital solutions to social problems and "Samia" that exemplifies the empowered global south's mother supposedly saved by such solutions.

The Motech assemblage

The *Mobile Technology for Community Health project* (Motech) was developed to improve maternal and child health in rural areas in developing countries thanks to mobile health devices. This project combines modules of health information for pregnant women and health professionals, identification and tracking of patients, collection and processing of health data, SMS alerts and voice messages. The project encloses implementation of different interrelated services using mobile phones. The two major services are a health information messaging system for pregnant women and lactating mothers and a data management system for community health workers. The aim of the first application is to provide maternal health information for pregnant women, mothers with children younger than 12 months and their families. Women have to sign up through community health workers to receive text or voice message in one of the regional languages with time-specific health information. The less than two minutes weekly messages encourage pregnant women to seek antenatal and postnatal care and to deliver in a health facility. In the first year of the child, the messages continue with health information regarding nutrition and health advice for the mother and child, such as family planning and alerts for immunization. The second application allows health workers to collect data on pregnant women and to plan their work accordingly, the system sending them automatic reminders about due dates of pregnant women under their responsibility. Motech was launched in Ghana in 2010 as a free mobile device, it was exported to Bihar (India) two years later based on the Ghanaian experience but as a fee-based service; pregnant women had to pay 1 rupee per vocal message.

From Gates foundation offices to community centers in villages, I've been questioning funders and administrators of Motech, as well as community health workers and individuals it targeted. This paper is based on empirical data collected between 2014 and 2016 in Ghana and India. Hundred individual interviews were conducted with professionals involved in mHealth in those two countries: ministries, public health agencies, United Nations agencies, NGOs, digital agencies, mobile operators, private foundations. Among these interviews, forty stakeholders were directly engaged in the implementation of Motech. A qualitative survey dedicated to Motech was also conducted in two districts of Ghana in 2014 and two districts of Bihar in 2015. 35 Motech project administrators, 20 health managers, 50 community health workers, and 200 women enrolled in the program were interviewed in focus groups or one-to-one interviews conducted in English or in local languages (Fanté and Hindi). This research mobilizes a wide literature combining Science, Technology and Society studies (STS), Information

and Communication Sciences to reveal transformations, power issues and inequalities at work in these new socio-technical artefacts[i]. Using Bill and Samia as two sides of the same Motech's story, I will discuss the ways in which global health as a field put forward mHealth and digital programs, as a new financial and technological priority for health programs in the Global South.

Bill, the "techy" philanthrocapitalist

Bill is the epitome of the "techy" philantrocapitalist. A broad world of private players, like mobile operators, cell phone manufacturers and private foundations from the digital sector that constitute core stakeholders of mHealth programs. All newcomers on the scene of international health, they contribute to the high proportion of private investors and public-private partnerships already associated with global health (Ollila 2005; Adams, Novotny, et Leslie 2008; Atlani-Duault et Vidal 2013). This participation of private companies to global health policies has mostly been studied through partnerships with pharmaceutical companies (Gerrets 2010; Guilbaud 2015) aimed at deploying vaccines or medicines. In line with a techno deterministic vision of aid (Cherlet 2014), "Bill" embodies a different convergence of interests between public health actors and private actors from the digital industry, a techno political convergence that has impact on the boundaries of public health itself (Al Dahdah 2019). "Bill" exemplifies this convergence between Global health and private tech companies. Bill could be Bill Gates, Mark Zuckerberg, Jeff Bezos, Eric Schmidt or the CSR departments of their respective tech firms or the different private foundations they created to host their philanthropic activities or "social businesses" [ii].

If Bill's side of the story is not limited to "Bill Gates" or the "Gates Foundation" however he is Motech's main sponsor from the Ghanaian launch in 2010 until today with the Indian national extension of the program. If Bill Gates has a central place in our specific case of study, he also has been identified has a major player in the field of global health, in the digital world and in the club of tech philanthropists. Like other tech philanthropists, Bill Gates believes in the power of technology to solve the problems of the world (Gates 2008). Funder of Microsoft, he naturally fosters the importance of Information and Communication Technologies among others. In 2008, he decided to shift his activities and time towards his philanthropic foundation. Each year, the Gates Foundation (BMGF) allocates more than $3 billion in grants to development projects, one-third of which is dedicated to "Global Health" programs. For Bill, improving health essentially requires new technologies (Fejerskov 2017). By suggesting the use of mobile technologies to improve maternal health in the developing world, Motech fits perfectly into Bill's vision of health: a precise technological response to a particular health issue. The proposed mHealth technology differs from traditional global health solutions, like a vaccine or a drug program, as mHealth devices completely depend on the digital world and appeared in the Global South less than 15 years ago with the recent popularization of mobile phone usage there.

mHealth programs, like Motech, are systematically relying on donations from digital companies or private ICT foundations[iii]. These new philanthropic entrepreneurs from the early 2000s - the Gates Foundation being a flagship among them - suggest a rapprochement or even a fusion of commercial exchange and giving. Because mHealth is at the intersection of two markets - that of mobile services

and health products – it is constantly drawn towards mobile-related commercial dynamics. Valued at USD 40.7 billion in 2019[iv], the global mHealth market responds to the mercantile logics of the telecommunications sector that sometimes undermine the health expectations that some may have vis-à-vis these services (Pew Research Center 2012; research2guidance 2013). The example of Motech illustrates the way in which philanthropic and commercial logics intersect, making mHealth a product of capitalism.

From philanthropic grants to the commercialization of the device, Motech's itinerary echoes the notion of "philanthrocapitalism", a way to deploy new markets through a good cause (Bishop et Green 2008). Bishop and Green identify the peculiarities of this two-tier philanthropic movement. At the micro level, philanthrocapitalists want to change the way philanthropy is done by applying Big Business rules to the charitable sector (by monitoring scholarship recipients, imposing profitability indicators and accounting targets). At the macro level, philanthrocapitalism refers to how capitalism itself can be naturally philanthropic, bringing social innovations through new products that benefit everyone (Bishop and Green, 2008). This term has since been taken up by several authors to explain a new way of giving which has become preponderant in many global health PPPs and development programs financed by private actors (Global Health Watch 2011; Aneja 2016; Martens et Seitz 2015). And according to all of them, Bill Gates and its foundation epitomize philantrocapitalism. The work carried out by the Gates Foundation is illustrative and showing the way to a broader global digital health field where many other private stakeholders are investing heavily in mHealth pilot projects in Africa and Asia sometimes even in a less cautious or restrained way.

The Gates Foundation is, above all, a technical expert and not a simple donor. It therefore provides not only funds, but also technical expertise as one of its employee explained to me: "*We don't give money if we don't know the area and can support you in terms of technical inputs*"[v]. The Motech platform and its applications embody the technical expertise of the Gates Foundation in the emerging field of mHealth. In fact, the Gates Foundation relies on a number of technical partners who are concretely in charge of developing the Motech platform. They are numerous, and they vary in size, structure and roles according to Motech's application areas; but all of them are private players from the Global North (Al Dahdah 2019). The Gates Foundation allocates the majority of its funds to organizations exempt from taxes[vi]. This phenomenon is evident in the Motech project, as the Gates Foundation's funds went massively to two Anglo-Saxon private foundations - the Grameen Foundation[vii] and BBC Media Action[viii] - which benefit precisely from this exemption status. Between 2006 and 2016, the Grameen Foundation has received 14 grants from the Gates Foundation to develop mobile services for the poor, covering at least an amount of $ 38 million, including $13 million allocated explicitly to Motech. Between 2006 and 2016, *BBC Media Action* has received $41.7 million from the Gates Foundation, 80% of these funds were allocated to India, of which 95% was exclusively focused on the deployment of Motech in Bihar ($ 31.8m). The Grameen Foundation is a transversal actor of the Motech project, in charge of the technical aspects of it and of its implementation in Ghana, whereas BBC Media Action manages implementation in India. Both Grameen and BBC Foundations have been focusing their activities on digital technologies over the past five years, thanks to Gates ' grants. Thus, the first recipients of Gates 'money for Motech are philanthropic foundations, which means that on the one hand Bill does not give grants to the states or public institutions and on the other

hand that the granted funds will not be taxed when arriving in the—also exempted—grantee's pocket. The public treasury will therefore not receive any share of these monies. But one could argue that Bill is not responsible for favorable tax policies for philanthropic activities. However, things get more problematic when the Foundation offers grants to private, for-profit companies. The double tax exemption mechanism involved in this kind of donation as been described for the most famous mobile money service in the world, mPesa (McGoey 2013, 85). The Gates Foundation allocated grants to Vodafone to deploy mobile financial services in Africa, exempting this multinational from paying taxes on "development" activities related to millions of dollars in grants. In the field of telecommunications, it is apparently easy to maintain the confusion between philanthropic donation and investment in commercial products like mPesa that is now a very lucrative mobile service sold by one of the biggest Telco[ix].

Motech presents the same configuration. Privately owned IT companies, have received millions from Gates in tax-exempted grants to develop software that will be part of their portfolio of commercial technical solutions. This double exemption system is a noticeable strategy of digital companies, who can thus save large sums on their research and development budget. Dimagi is Motech's most visible technical contractor. This American "social enterprise" specialized in ICT for development (ICT4D) has been working with Gates since February 2012 to improve Motech : "*Dimagi is also our partner at a higher level, for any Motech work. Any project that has a Motech component they are involved with. Grameen and Dimagi both work together on the customization*"[x]. Between 2012 and 2016, the company has received at least $ 13.3 million of grants from Gates to develop mobile technologies in developing countries. Dimagi employs about a hundred people worldwide with teams mainly at the company headquarters in Cambridge, Massachusetts. Dimagi is an interesting example of a Global North company geared towards the Global South; it is a recognized member of the American benefit corporations group or B Corp, a label that unites the adepts of "social capitalism". According to Dimagi Vice President Carter Powers, Dimagi's mission is triple: "*impact, team satisfaction and profit"* [xi]. With the national extension of Motech in India, another international digital company is emerging as Motech's new partner: IMImobile[xii]. Based in London with offices in Hyderabad, Atlanta and Dubai, IMImobile is a private company listed on the London stock exchange, which employs 700 people worldwide. IMImobile is helping to deploy a new version of Motech platform, able to manage the mass of data, the different IVR systems in local languages, the connectivity challenges with the different mobile operators required by the national extension of Motech in India.

The Gates, BBC and Grameen Foundations, IMI Mobile, and Dimagi are all private entities from the Global North. They constitute major stakeholders of the project and promote through this device the ability of mobile technologies to solve health and social problems and the efficacy of business solutions to generate income and economic growth in the Global South. They highlight the fact that Gates foundation does not direct its funding towards businesses or players from the Global South. In 2009, David McCoy and his colleagues studied Gates' overall investment in "global health" and showed that out of the 659 grants awarded; only 5% went to organizations in "low or middle income" countries (McCoy et al. 2009). Investments in telecommunications by Global North actors in the Global South are seen as contributions to help the development of poor countries, even if these strategies by the richest businesses and individuals necessarily lead to a reduction of resources for public services and

hence for public health systems. A recent report of the United Nations Conference on International Trade shows that developing countries lose at least $100 billion in annual revenues from the tax evasion mechanisms of multinational corporations (UNCTAD 2015), billions that could be invested by these same developing countries in public services or development programs.

Philanthrocapitalists like Bill, through their gifts, display their belief in the inefficiency of the state and their aversion to mechanisms of distributive justice such as taxation. They believe in managerial performance and prosperity through markets: in this respect, they consider the gift as a capitalist investment to be monitored and made profitable. As Bill explains, generous involvement calls for recognition, a "return" on investment (Gates 2008). These entrepreneurs advocate a more rational management of the funds allocated by philanthropy, in particular through support for narrow and short-term projects. The Gates Foundation describes its operations in terms of strategies, objectives to be achieved, allocation of resources, and investment: "*we develop goals and strategies before allocating resources and making investments*" [xiii]. This way, the notion of investment—the sacrifice of resources today to hope for profit tomorrow—is central to the discourse of tech philanthropists. They speak of investment and not of giving; they place their money in projects that are in line with their global policy and expect results and "successes" out of it. It is precisely this return on investment that is at the heart of "philanthrocapitalism". Birn offers a historical perspective on this form of donation and highlights an entrepreneurial vision already present with early 20th century philanthropists like Carnegie or Rockefeller. But she explains that today's philanthrocapitalists carry the commercial dimension of gift and the valuation of commercial interests farther than the ancestors of philantrocapitalism. She emphasizes that beyond commercial interests, the idea is now to move health from the public domain to the private commercial sector (Birn 2014). There is "*no such thing as a free gift*" as stated by McGoey and this form of philanthropy is, in fact, a new way to make huge profits (McGoey 2015).

The itinerary of Motech in Ghana and India illustrates the commercial turn that mHealth can take. Initially conceived as a randomized controlled trial (RCT), Motech Ghana did not start with obvious mercantile characteristics. Indeed, it was positioning itself as a free service offered to pregnant women and healthcare workers. Nevertheless, from the beginning the Motech documentation used the word client to talk about beneficiaries of the program, which positions the device in consumerist logic. The commercial dimension of Motech will be strengthened over time. The world of mobile phones and mobile applications reinforces this mercantile approach and dramatically draws mHealth towards commercial consumption practices. The commercialization of Motech in Ghana by the biggest Telco (MTN) in 2013 shows the direct link between the philanthropic activities of ICT Foundations and the economic strategies of mobile enterprises and marks a decisive turn towards markets for Motech; Motech then becomes a product of the mobile economy provided by a multinational company with half revenue shares for the foundations. Launched at the same time, the Indian version of Motech was conceived from the beginning as a marketing venture and a paid service.

As explained by several employees of the program, the idea is also to pursue different business strategies: "*We are trying to see if it's possible to bundle the service along with some commodities and some products, that the private sector can sell"*[xiv]. Among these products, the application could be part of a private health micro-insurance package. Subscribers to this health insurance may receive Motech messages as part of there premium scheme. This service could also be sold with health or mass

consumer products associated with pregnancy. For instance, women who have purchased a sponsored product (such as antiseptic or diapers) would access Motech messages for free. Finally, advertising and discount coupons from sponsor brands could sponsor the service. For example, a nutrition-related message from Motech could be associated with a particular food product and benefit from a coupon received by SMS to get a discount price on that same product. These "combined offers" would make it possible to finance the costs of the device while making it paid by the beneficiaries at a lower cost according to the promoters of Motech. In any case, the "beneficiaries" directly and/or indirectly pay the service. While the Motech business model is still not stabilized, the application is perceived by several stakeholders as a commercial product that would compensate for costs and even generate profits like other value added services of the mobile economy.

The commercial interests of mHealth are multiple and vary according to the players involved. ICT Foundations seek to sell their expertise to customize the mobile platforms or content disseminated on these devices. Through mHealth, mobile operators are looking to sell more airtime or overage charges for using such services. Each of these players has a particular expertise; a service to sell that will make it more innovative or more "competitive". Motech's funders and implementers defend market interests, rights, and forms of ownership ; even while enjoying a non-profit status for some of them. The ownership issues are very present in the Motech device; each 'partner' defends its own interests and the possibility of making profit through this initial investment. If stakeholders do not brand patents related to Motech, they specialize their services and products to become key players of the mHealth market in developing countries. Knowing that a private actor from the Global North developed each and every component of Motech, the property claims and interests defended here - if they can sometimes benefit the local businesses or branches of multinational companies - are not to the benefit of the Global South's public services or common people.

While mHealth exists through philanthropic donations, this does not prevent its inclusion in commercial logics as a marketable digital health product. The Motech program is part of the growing wave of international public-private health partnerships involving philanthropic foundations that invest only in private foundations or private for profit companies from the Global North. Indeed, Motech gives ownership rights to private actors of the Global North only and not to the public services and governments of the Global South that contributed to its implementation. While evaluating their investments and potential image and economic spin-offs, these new mHealth entrepreneurs say they can leave a positive impact and improve the lives of people in the poorest countries; they think they "can start saving lives now" thanks to Motech[xv]. Whose lives does such a statement concern? Lives of pregnant women and young mothers targeted as potential clients of the service, like Samia.

Samia, the "empowered" global south's mother

As Bill is the epitome of the "techy" philantrocapitalist, Samia is the symbol of thousands of women in Ghana and India that have been targeted as "beneficiaries" or "clients" of Motech. Like many other mHealth projects targeting women, Motech leans on a promise of empowerment for women. 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 behaviors. In fact, this promise is based on the "knowledge deficit model" (Wynne et 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 behaviors whereas experts (here doctors) can make informed choices. Both in India and Ghana, rural women targeted by the program 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 thing 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*"[xvi].

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 and make informed consumer choices: "*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 behavior and what practice should be there around the behavior*"[xvii]. In order to help its clients to take the right decisions 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*"[xviii]. Motech program suggests one's health will improve as long as one follows the instructions of the device to take the good products or the "right" health decision advertised by the mHealth program. This injunction doesn't really look like a gain of power or autonomy but more like a top-down branded prescription. A top-down pressure that was reported and criticized by many "targeted" women I met in Ghana and India, who questioned the accessibility, the meaning and consequences of Motech on their lives (Al Dahdah 2017).

Firstly, to be able to receive Motech messages, you need to have access to a "functional" mobile phone loaded with credit. 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 those technologies are conceptualized, developed and deployed by men (Henwood et 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 seems to be 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 and this figure rises to 43% 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 my fieldwork gave a lot of material on this. The Bihar experiment magnifies particularly gender inequalities and male domination, the Ghanaian situation is less imbalanced but still holds exactly the same gender issues than India, with male having a better access to mobile phones. Several recent studies on South Asia (Handapangoda et Kumara 2013; Zainudeen, Iqbal, et Samarajiva 2010) and Sub-Saharan Africa (Murphy et Priebe 2011) confirm my observations concerning gender inequalities associated with mobile phones usage in these regions.

When Motech was launched in 2010, only 1,8% of women in the region of Ghana where Motech was first piloted owned a phone (UN et Ghana Statistical Service 2013, 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*"[xix]. 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[xx]. In rural India, where the mobile phone penetration rate is around 48% (TRAI 2015), accessing mobile phones is even more difficult for women, because the overall penetration rate is lower but also because the gender gap is wider.

Half of the women I met in Bihar and almost 80 per cent of the women I met in Central Ghana had their own phone. But those women are over-represented in my study compared to the general population, because they were the ones targeted in 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*"[xxi]. 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? There are some that have phones but the phones have faults but they do not have money to repair the phone*"[xxii] . 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.*"[xxiii] ; "*There when I was with my husband, he kept the mobile with him, here at my mother's home, my brother keeps it*"[xxiv]. 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.*"[xxv].

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*"[xxvi]. 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 and the service also creates conflicts between men and women because of those 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*"[xxvii], "*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*"[xxviii]. Thus, maternal mHealth projects, like Motech, are the site of amplified gender divisions (Al Dahdah 2017). Indeed, maternal health in those projects is relying almost exclusively on women whereas access to technologies is still a male prerogative. Then, addressing maternal health messages *via* mobile raises a lot of gender issues and relays inequalities linked to gendered access and uses of the technical device.

Secondly, even if we put aside the questionable accessibility of the device by women and focus only on the acceptance of the information transmitted by Motech - that constitutes the mainstay of its alleged empowering effect - the enrolled women talk about numerous frictions related to Motech. 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*"[xxix]; "*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 the call me I have to be able to pick up and listen to what they are saying*"[xxx]. 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 pushy community health workers that get mobile phone credits for each Motech client they subscribe, as explained by this woman and many other participants: "*I was not told that money would get deducted for the calls*"[xxxi].

Thirdly, women enrolled in Motech showed us that the link between "receiving a message" and "changing behaviors" was (of course) not evidenced at all. Several women talked about messages they voluntarily not followed because they don't see the point or because it goes against their own experience or local knowledge, as detailed by several mothers : "*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?*"[xxxii]; "*They tell us not to purge*[xxxiii] *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*"[xxxiv]; "*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*"[xxxv]. 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 (Hancart Petitet 2008). They reiterate the importance of taking into account and integrating local knowledge rather than debunking it rapidly, which represents an additional violence towards women; violence that women perceive and relay by criticizing the device and highlighting its limitations.

Indeed, many women - 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"*[xxxvi]; "*You could only listen to it and not speak anything, it's an issue*"[xxxvii]. 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*"[xxxviii]. 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 advertised by the promoters of mHealth: reduce caregiver-patient interactions and loosen the link with the health system.

Furthermore, 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*"[xxxix]. Not taking into account the voice and needs of the women targeted by the device, not offering any dialogue seems incompatible with the original idea of any care service. This device constitutes a supplementary form of authority that women are not allowed to question. Thus, to envision strengthening healthcare seeking behaviors and reinforcing the caregiver-patient relationship without any dialogue 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 prevents them from going to the health center: "*It's been helpful receiving the messages from the phone, that way you don't have an encounter with anybody*"[xl]. More than gaining autonomy, Motech can become a way to opt out of the health system.

Finally, several women express the gap between Motech messages and their concrete access to 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 that 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*"[xli]. 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 to overcome. Obstacles already identified as the main causes of death for pregnant women (Ronsmans and Graham, 2006 ; WHO et al., 2014) and regularly stated by my 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*"[xlii]*;* "*Transport to the hospital is through a jeep and it charges 500-600inr (7-8€) to take us to the hospital. Ambulance never comes here*"[xliii].

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 asked 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*"[xliv]; "*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*" [xlv]. Transportation, quality of care, patient-caregiver relationships, costs and conditions of delivery, constitute crucial barriers to institutional deliveries in rural Ghana as well as in Bihar (India) : "*It is just that people go to the primary health center 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*"[xlvi]. 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 reminder of such difficulties for women that cannot afford institutional delivery but also for women that paid for it and had such a bad experience.

Conclusion

mHealth programs like Motech pretend to be universal, more accessible and cost-effective than traditional maternal health programs, but by focusing on information delivery, the device sidesteps the complex assemblage of dynamics and determinants of health that compose any given healthcare system. Such segmented view of health through technologies - focusing on expanding access to mhealth while not improving public health services - dodges social and economic issues rooted in healthcare. Motech is limited to the dissemination of health information and does not allow the creation of a dialogue 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. means that any improvements to access will be limited

The empowerment offered by Motech, far from being liberating and political, is instrumental and individualistic. Motech embodies perfectly a reductionist view of power relations and domination that offers to compensate gender inequalities by sending unquestionable centralized and automated information. It has no proven positive impact on maternal health outcomes but still it manages to exist and to expand in the past ten years.

My central argument is also that having positive health outcomes is not the primary goal of these programs. According to many stakeholders of mHealth in developing countries, the idea is to test new digital products for untapped markets in the Global South. The final goal is to make sure that women like Samia will take the decision to spend 1 rupee to listen to Motech's message out of the average 8 rupees she can spend on a day for her household[xlvii]; a marketing venture that Peter Redfield describes as "*gadget capitalism with a human face*" (Redfield 2015, 78). The term *gadget* should be taken seriously, when one looks at mHealth devices. While mobile applications leave no material traces, no physical infrastructures, no specialized skills or knowledge in the countries where they are deployed, they nevertheless offer a new mercantile approach to care and health administration that leaves traces. They contribute indeed to the commodification of health, the creation of new private digital health markets geared toward the poor and the disruption of public health services in the Global South.

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[i] I already published several articles based on Motech's empirical data, one focusing on the public-private partnership dimension of Motech in *Development and Change*, another on the research objectives and scientific goals of Motech in *Science Technology and Human Values*, another on the empowering effect of Motech in *Gender, Technology and Development*, this original paper is based on the same dataset and building on these previous papers but it's confronting for the first time the perception of both implementers and users of Motech and questioning health inequalities related to it.

[ii] CSR stands for « Corporate social responsibility », such departments have been burgeoning in private firms to host activities that are "good for society", such activities can also be handled by a private foundation attached to such CSR department.

[iii] ICT Foundations are foundations funded by companies from the Information and communication technologies sector, being Mobile phone operators like the Vodafone Foundation, or Software or Social Network firms like Microsoft or Facebook.

[iv] See « MHealth Market Size, Share I Global Industry Trends Report, 2027 ». Consulted on 14th octobre 2020. https://www.grandviewresearch.com/industry-analysis/mhealth-market.
[v] Interview with B, Gates F. Delhi, 02/15.
[vi]Excerpt from Gates Foundation website : http://www.gatesfoundation.org/How-We-Work/General-Information/What-We-Do-Not-Fund , consulted on 02/04/16.
[vii] Founded in 1997, the Grameen Foundation is part of the nebula of organizations (around fifty) - Grameen Danone, Grameen Phone, Grameen Intel - which follow the philosophy of the micro-credit bank, established in Bangladesh in 1976 by Mohammed Yunus. This American foundation aims to disseminate the Grameen bank model by providing access to micro-credit and by offering banking services adapted to "the poorest of the poor". The foundation moved into digital technology at the beginning of 2000 and has been involved in the "mobile for development" sector, mainly through mobile banking services (mMoney or mBanking) for the poor.
Founded in 1993, BBC Media Action is the philanthropic arm of the BBC Group. The Foundation calls for the use of Media and Communication to reduce poverty[viii]. Based in London, the foundation extended its operations to India in 1999. The Gates Foundation is the second largest donor to the BBC Foundation after the British Department for International Development (DFID).
[ix] Telco is the term used to shorten « Telecommunication companies ».
[x] Interview with B, Gates F. Delhi, 02/15
[xi] Excerpt from « For many, 'B Corp' is good business ». Boston Business Journal, 10 February 2012.
[xii] "*IMImobile enables organizations of all sizes and sectors to maximize the potential of mobile technologies to improve customer engagement. We believe that mobile will sit at the heart of customer engagement strategies for years to come*" quote from IMImobile's Website consulted on 05/04/16.
[xiii] Gates Foundation website : http://www.gatesfoundation.org/How-We-Work consulted on 02/04/16.
[xiv] Interview with E., Grameen F., Accra, 06/14.
[xv] Excerpt from the article wrote by the head of the Motech project in India entitled "Six lessons I learnt while trying to reach 10 million women in India with life-saving health information" : http://blogs.worldbank.org/publicsphere/six-lessons-i-learnt-while-trying-reach-10-million-women-india-life-saving-health-information
[xvi] Interview with G., Grameen F., Ghana, 06/14
[xvii] Interview with A, BBC, Delhi, India 03/15
[xviii] Interview with H, BBC M A, Delhi, 08/15
[xix] Interview with E., Former Motech Staff, Ghana, 06/14
[xx] 100% penetration rate means there are as many SIM cards as adults in the country but with a 90% prepaid users based market, in Ghana middle class and upper middle class people have 2 to 3 SIM cards per mobile phone to have the best deals and to switch mobile operators depending of where they are and what bonuses they can use. In Ghana there is like in the rest of Africa a gender bias towards access to mobile phones and a woman have 12% less chance to own a mobile phone than a man a number that rises with rurality and poverty. So poor women from rural Ghana that were targeted by Motech did not have an easy access to mobile phones.
[xxi] Interview with a community health worker, Patna, India, 09/15.
[xxii] Women Focus Group n°3, Apam, Ghana, 06/14
[xxiii] Women Focus Group n°1, Apam, Ghana, 06/14
[xxiv] Women Focus Group n°1, Patna, India, 09/15
[xxv] Women Focus Group n°7, Samastipur, India, 09/15
[xxvi] Women Focus Group n°2, Apam, Ghana, 06/14
[xxvii] Women Focus Group n°1, Patna, India, 09/15
[xxviii] Women Focus Group n°1, Patna, India, 09/15
[xxix] Women Focus Group n°1, Apam, Ghana, 06/14
[xxx] Women Focus Group n°4, Apam, Ghana, 06/14
[xxxi] Women Focus Group n°11, Samastipur, India, 10/15
[xxxii] Women Focus Group n°4, Apam, Ghana, 06/14
[xxxiii] To purge is to give plants and/or concoctions that make the child vomiting.
[xxxiv] Women Focus Group n°3, Apam, Ghana, 06/14
[xxxv] Women Focus Group n°1, Apam, Ghana, 06/14
[xxxvi] Women Focus Group n°3, Apam, Ghana, 06/14
[xxxvii] Women Focus Group n°2, Patna, India, 09/15
[xxxviii] Women Focus Group n°2, Patna, India, 09/15
[xxxix] Women Focus Group n°4, Apam, Ghana, 06/14
[xl] Women Focus Group n°4, Apam, Ghana, 06/14
[xli] Women Focus Group n°3, Patna, India, 09/15
[xlii] Women Focus Group n°2, Apam, Ghana, 06/14
[xliii] Women Focus Group n°10, Samastipur, India, 10/15
[xliv] Women Focus Group n°5, Apam, Ghana, 06/14
[xlv] Women Focus Group n°7, Samastipur, India, 09/15
[xlvi] Women Focus Group n°10, Samastipur, India, 10/15
[xlvii] In 2011, the per capita monthly consumption expenditure of Rural Bihar is the lowest in India at 780 rupees per month (10 euros), or 24 rupees of expenditure per day (30 eurocents), 65% of these expenses are for food only, leaving about Rs. 8 per day for all other types of expenses.Then, 1 rupee is not a negligible sum for a bihari household (Source : Government of India's National Sample Survey Office (NSSO), NSSO Household Expenditure Survey 66th Round, 2011).