Mobile for Development

Catalysing mHealth Services for Scale and Sustainability in Nigeria

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Executive summary

There has been considerable progress so far in reducing child and maternal mortality globally: child deaths were reduced from an annual 12.7 million to 6.3 million and maternal deaths from an annual 525,000 to 289,000 between 1990 and 2013. Despite the significant number of lives saved, many countries globally, including Nigeria, will fail to meet the Millennium Development Goals (MDGs): reduce maternal and child mortality rates by three-quarters and two-thirds respectively.

To speed-up the efforts in reducing maternal and under-five child mortality, the causes of which are largely preventable and treatable, the Nigerian government launched a number of initiatives including the Maternal, Newborn and Child Health Week (MNCH Week) and Saving One Million Lives (SOML) in 2009 and 2012 respectively. Overall, these programmes have helped to improve access to important nutrition and maternal and child health interventions. Participation in the MNCH Week has, however, been perceived to be at sub-optimal level due to a number of factors, one of which is the programme's low awareness level.

Despite the fact that at least two in three consumers have access to a mobile phone in Nigeria, its power to drive awareness of valuable government health programmes has yet to be fully harnessed. While mHealth in Nigeria is flourishing, it faces various challenges, such as fragmentation, lack of sustainable funding and suitable business models, which would allow mHealth to move from introduction/pilot to growth stage.

The GSMA Mobile for Development mHealth programme aims to address some of these challenges, by securing commitments and aligning collaboration incentives for mobile and health stakeholders at both regional and local levels. At regional level, the GSMA has secured a series of compelling group-level commitments with key mobile stakeholders in Africa, which make it feasible to offer a basic suite of free health and nutrition messaging services to consumers, in exchange for aggregating services in a commercial model, which will create sustainability in the long term.

At country level, as illustrated in the case of Nigeria, the GSMA has explored how such commitments might play out and respond in a compelling way to local operational realities and conditions. One challenge is industry fragmentation, which makes it difficult to launch any service commercially despite innovations in the addressing of health conditions. The GSMA believes that aggregating services in different health areas under a framework of useful mHealth categories (pull/push messaging, health hotlines and mobile financial services) is an important strategy to promote sustainability in the industry. However, the GSMA also recognises that there is no quick solution to achieve aggregation, but rather a staged process of pilots that could minimise investment risks.

Working with local mHealth stakeholders in Nigeria, the GSMA assisted in designing and launching a series of three mHealth services, which worked in tandem as part of a larger product strategy to drive commercial sustainability across the sector:

- **Stage 1:** MNCH Week social mobilisation, a free messaging service to promote MNCH Week.
- **Stage 2:** Piloting of "push MNCH content" (Grameen Foundation's Mobile Midwife) and "Connect to a Healthcare Professional" (VAS2Nets' Dial-a-Doctor health hotline service), with primarily premium components.
- **Stage 3:** Bundling of "push MNCH content" and "Connect to a Healthcare Professional" together with a number of other related health services, incorporating both free and premium components.

The two rounds of MNCH Week in May and November 2014 provided a great opportunity to illustrate the value of mHealth in the programme's social mobilisation process. As many as 3.6 million women in Lagos and Kano states, two of Nigeria's most populous states, were informed about MNCH Week. Further messages were sent to a number of women, who registered and agreed to receive a stage-based messaging service, to promote demand for MNCH and nutrition services and encourage demand for antenatal care (ANC) and immunisation services. A survey was conducted among those who participated in the MNCH Week in May 2014 in Lagos to understand how women learned about the initiative. Twenty-six percent (26%) claimed that they learned about the programme through SMS and IVR broadcasts, indicating that mHealth is more effective for social mobilisation than other mass media such as radio (4%) or television (4%).

Fulfilling the objective to use mHealth in MNCH Week's social mobilisation would not have been possible without the contribution of each of the public and private stakeholders who were involved in the initiative, particularly the financial backing of the Private Sector Health Alliance of Nigeria, as well as VAS2Nets Technologies, one of Nigeria's leading mobile Value Added Services (mVAS) providers. In addition to financial support, VAS2Nets also provided technical expertise in order to develop the platforms required to run the campaign.

Leveraging its experience from MNCH Week, VAS2Nets continuously explored ways on how to illustrate the value of mobile technology in the delivery of healthcare services. In partnership with Airtel and Grameen Foundation, it piloted Mobile Midwife (a maternal and child health messaging service) and Dial-a-Doctor in October 2014. Adoption of the service is promising so far and, to fully leverage the GSMA's technical support and linkages to capable partners, from mid-2015 VAS2Nets intends to enhance its mHealth offering by bundling a number of other health-related services such as nutrition and health insurance on top of Mobile Midwife and Dial-A-Doctor. Participation in these activities has become a core part of VAS2Nets' commercial strategy to differentiate itself from being a pure play mobile aggregator to being one with specialist sector experience. Its investment in MNCH Week has provided the organisation adequate return in terms of proving its capability as a credible mHealth provider.

For Airtel Nigeria, results from this collaboration also provided evidence that mHealth should not just be viewed as a service with direct revenue contribution, but one that can significantly add value for customers and in doing so reduce churn and extend customer lifetime value for the core business.

The potential commercial viability of this aggregated mHealth service is the business case that private sector stakeholders are looking for in order to continue supporting more public sector-facing mHealth services on a wider scale. While it may take a year or two to gather evidence to assess how well consumers continuously adopt this bundled mHealth services, this last year has at least demonstrated the usefulness of collaboration between health implementers, mobile operators and mobile aggregators in taking mHealth beyond the pilot stage.

1. Introduction

Global overview

As part of the MDGs[1], in 2000 the international community set targets to reduce under-five mortality (U5MR) and maternal mortality (MMR) rates by two-thirds and three-quarters, respectively, by 2015. According to the World Health Organization (WHO), global annual child and maternal mortalities, in absolute terms, have been reduced by 50% and 45%, respectively, from 1990 until 2013. This translates to a reduction of the U5 mortality from 12.7 million to 6.3 million and of the maternal mortality from around 525,000 to 289,000 over the same period. While the number of lives saved each year is significant, the actual reduction rates (3% child mortality and 2.6% maternal mortality) fall short of the target reduction rates (4.5% child mortality and 5.5% maternal mortality), meaning that the MDG targets for U5MR and MMR will only be achieved by 2026 and 2042 respectively.

Nigeria overview

In 2013, the Sub-Sahara African (SSA) countries combined accounted for the largest share of child deaths (50% share of global deaths: 3.1 million) and maternal deaths (62% share of global deaths: 179,000). Nigeria, which is the most populous country, has the largest share of child mortality (26% share of SSA deaths: 804,000) and maternal mortality (22% share of SSA deaths: 40,000) in the region. With 117 under-five deaths per 1,000 live births (down from 213 in 1990) and 560 maternal deaths per 100,000 live births (down from 1,200 in 1990), Nigeria has made considerable progress, but is unlikely to meet its specific targets: 64 deaths per 1,000 live births[2] for MDG 4 and 250 deaths per 100,000 live births for MDG 5 by 2015.

Addressing child and maternal mortalities in Nigeria

The primary causes of child and maternal mortalities in Nigeria are mostly preventable or treatable (see tables 1 and 2). Malnutrition is the primary underlying cause of mortality and accounts for 53% of deaths of under-five children. For maternal mortality, haemorrhage and infection are the top two causes – both of which are preventable if women are provided access to ANC during pregnancy and skilled care during childbirth. However, according to the most recent Demographic and Health Survey conducted in Nigeria in 2013, only 61% of pregnant women had at least one ANC visit, with 51% recording four or more visits but only 18% having ANC by the fourth month of pregnancy, which is the recommended best practice.

Table 1: Top causes of child mortality in Nigeria, 2010

Top causes of child mortality		
Neonatal	26%	Underlying cause: 53% attributable to malnutrition
Malaria	24%	
Pneumonia	20%	
Diarrhoea	16%	
Measles	6%	
Others	8%	

Source: National Strategic Health Development Plan, 2010

Table 2: Top causes of maternal mortality in Nigeria, 2010

Top causes of maternal mortality	
Haemorrhage	23%
Infection	17%
Toxaemia/Eclampsia	11%
Unsafe abortion	11%
Obstructed labour	11%
Malaria	11%
Anaemia	11%
Others	5%

Source: National Strategic Health Development Plan, 2010

mNutrition initiative

The GSMA Mobile for Development mHealth programme connects the mobile and health industries, with the aim of developing commercially sustainable mHealth services which meet public health needs. In September 2013, the GSMA mHealth programme partnered with UK aid from the Department for International Development (DFID) and the Norwegian Agency for Development Cooperation (Norad), to support the scale-up of mobile nutrition (mNutrition) services targeting maternal and child health, in alignment to MDGs 4, 5 and 6. The mNutrition initiative is closely aligned to the UN's Every Woman Every Child Initiative, Scaling Up Nutrition (SUN) and the Global Nutrition for Growth Compact. The GSMA mNutrition initiative has prioritised 10 countries in Sub-Saharan Africa: Côte d'Ivoire, Ghana, Kenya, Malawi, Mozambique, Nigeria, Rwanda, Tanzania, Uganda and Zambia.

As part of its efforts to further reduce under-five mortality and maternal mortality, the Nigerian government launched a number of initiatives including the MNCH Week in 2009 and the SOML initiative in 2012.

- **MNCH Week** is coordinated by the National Primary Health Care Development Agency. MNCH Week is a bi-annual primary healthcare event organised across Nigeria, which aims to deliver a package of basic interventions focused on maternal and child health. Examples of services and supplies provided include vitamin A supplements, routine immunisations, deworming tablets, screening for malnutrition and the long-lasting insecticide-treated nets.
- **SOML** builds on existing policies, strategic documents and frameworks as outlined by the National Strategic Health Development Plan and the former Nigerian President Jonathan Goodluck's Transformative Agenda. It aims to scale-up access to essential primary healthcare services for women and children. One of its objectives is to leverage technology to improve the delivery of basic healthcare services, including a desire to *"promote the use of mobile phone technology as a means of leap-frogging in the areas of health information, point of service support, financing, client engagement, quality assurance and logistics management."*

Surpassing mass media, such as television, in terms of penetration and consumer reach (see table 3), the mobile phone has become an important medium in the delivery of services, including finance and healthcare, especially to the bottom of the pyramid (BoP) consumers. As illustrated by a broad range of health-related services that have been launched globally using mobile technology, mHealth is useful in wellness, behaviour change and prevention.

Table 3: Ownership and access to media and ICT in Nigeria, % individuals

	Ownership	Access only	Total
Radio (2010)	30.6	52.3	82.9
TV (2010)	13.3	31.5	44.8
Mobile telephone (2010)*	30.4	33.5	63.9
Fixed line telephone (2009)	0.9	2.5	3.4
PC (2010)	0.9	3.6	4.5
Internet (2010)	0.5	3.1	3.6

Source: Annual Abstract of Statistics, 2012, National Burea of Statistics of Nigeria

*Note: According to GSMA Intelligence, the mobile market penetration (based on unique subscription) is 43.8% as of end-2014

[1] *The Millennium Development Goals compose of eight goals which aim to address various societal issues, ranging from extreme poverty to halting spread of HIV/AIDS. The fourth and fifth goals, which are commonly referred to as MDG 4 and MDG 5, respectively, aim to reduce child and maternal mortality by two-thirds and three-quarters, respectively.*

[2] *Different target levels for MDG4 are being publicised: In Maternal, Newborn and Child Health in Nigeria: Where are We Now? presentation made by Minister Onyebuchi Chukwu in October 2011, the stated target is 77 deaths per 1,000 live births whereas in the MDG Report 2010: Nigeria Millennium Development Goals, the stated target is 64.*

2. Product concept

Current State: mHealth challenges

A fragmented industry that is not interoperable

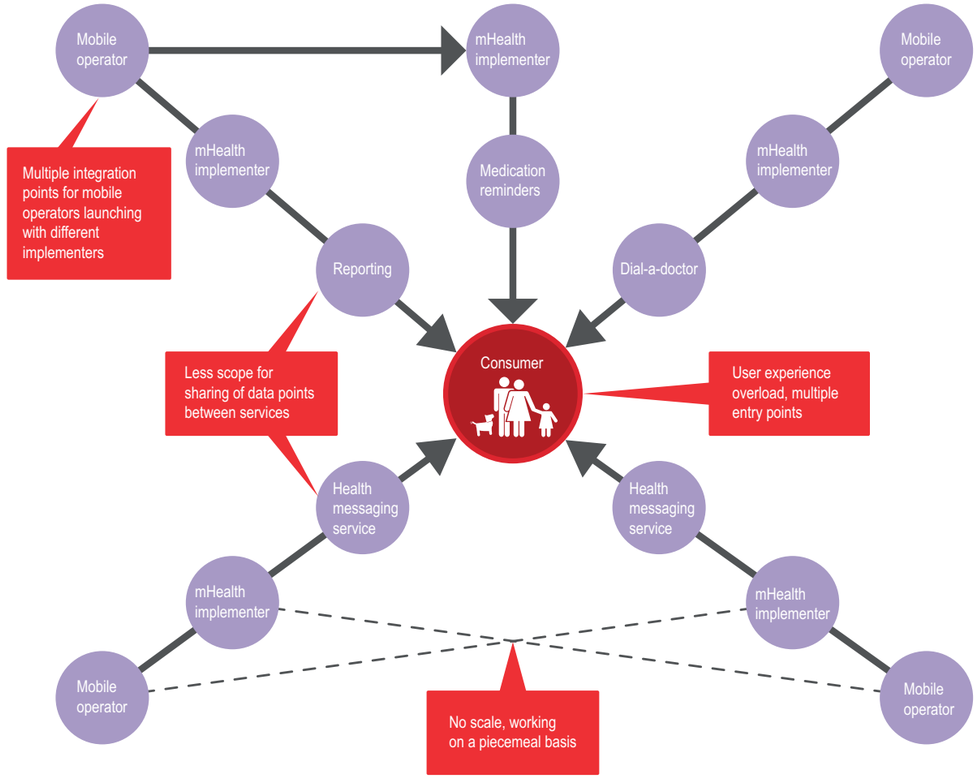
The GSMA has identified and tracks more than 1,100 mHealth services globally, of which at least 45 have already launched or are in the process of being launched in Nigeria[3]. While the versatility of mobile technology has led to various mHealth innovations, the industry has become highly fragmented. As most regulatory framework and implementation guidelines have only been developed in response to burgeoning mHealth innovations, the technical standards and clinical protocols used by mHealth technology providers are different, which has led to a system that lacks interoperability and a value chain that is disjointed, limiting the opportunities for broad consumer adoption and national scale (see figure 4).

Lack of funding and sustainable business models

While many mHealth services are proven to work well after being tested in randomised control trials, many are still in the introduction or trial stage primarily because the grants provided are adequate only for the pilot stage (see figure 5), often leading to what is popularly known as “mHealth pilotitis”.

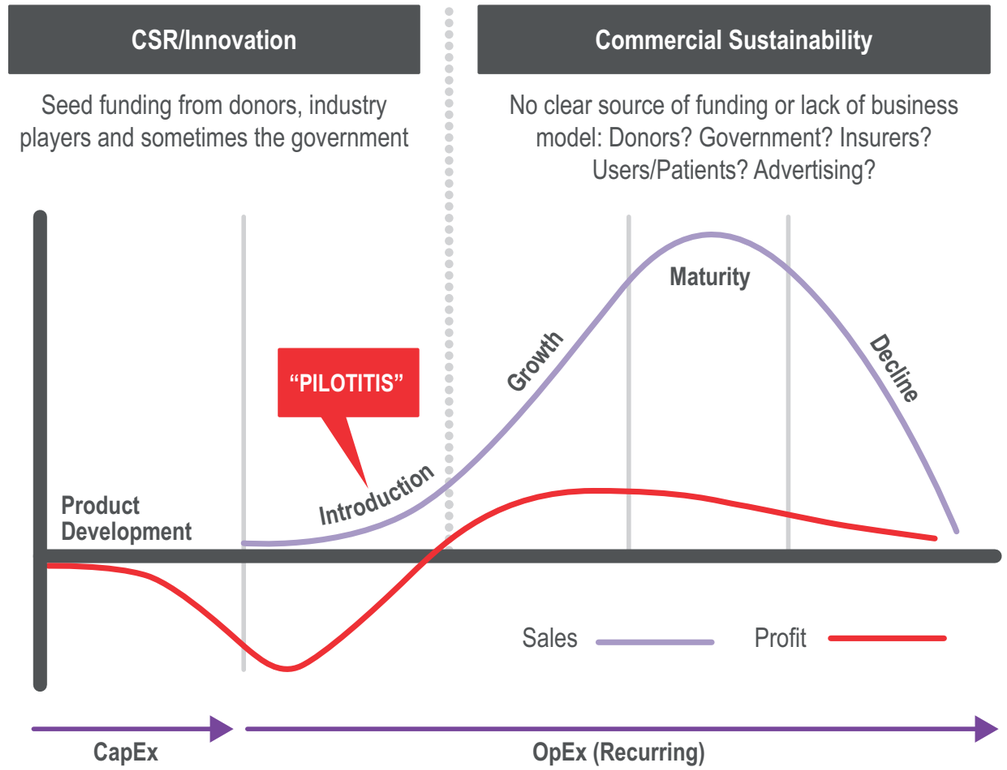
In her 2012 blog “Pilotitis: What’s the cure?”, Sara Chamberlain, the Head of ICT in India for BBC Media Action, provided her own prognosis on why mHealth pilotitis exists: (1) lack of understanding between the mobile and development/health sectors (and essentially a mismatch of organisational goals); (2) donors are funding primarily short-term pilots; (3) high taxation on mobile Value Added Services (mVAS); and (4) perceived lack of evidence that mHealth leads to efficiency or helps change health behaviour.

Figure 4: The current (fragmented) mHealth service model



[3] *Please refer to GSMA’s mHealth tracker (http://www.m4dimpact.com/data/sectors/mhealth-sector), part of the GSMA’s Mobile for Development Impact online tool, for full details on various mHealth initiatives globally.*

Figure 5: mHealth pilotitis



Many donors choose to provide funding to take a service from introduction to growth stage, as in the case of the Bill & Melinda Gates Foundation (BMGF), whose funding was crucial in supporting Kilkari[4], an audio messaging service for pregnant women and mothers which was initially piloted in Bihar, India and is now being rolled-out nationally by the Indian government. However, it is important to explore other funding avenues as part of the process to identify sustainable business models, including the possibility of government subsidies, agreeing with mobile operators to zero-rate their services and charging consumers for accessing the service. These additional funding sources, on top of BMGF’s funding, were crucial in taking Kilkari beyond the pilot stage.

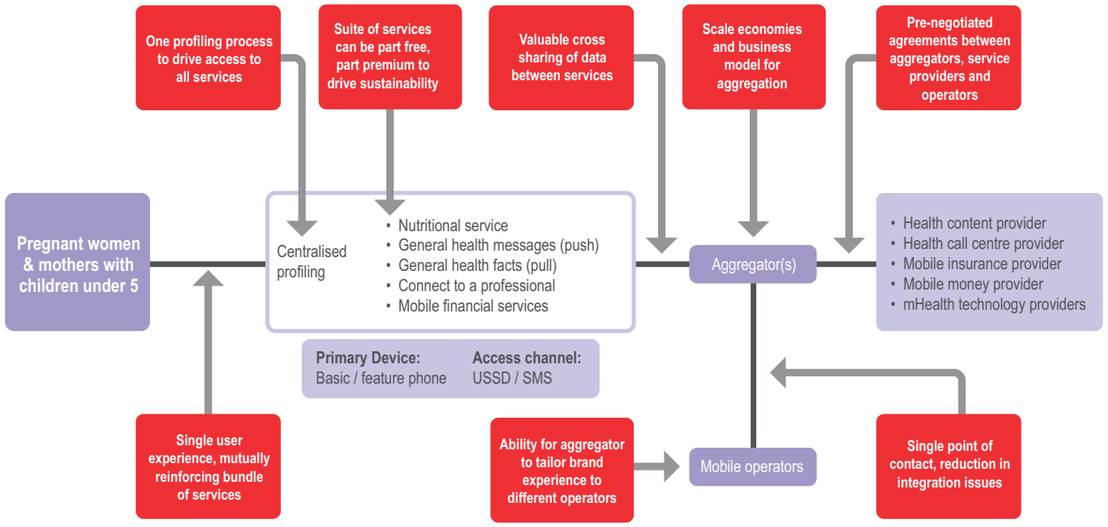
Target State: Addressing Fragmentation and Lack of Scale in mHealth

As part of the mNutrition initiative, the GSMA Mobile for Development mHealth programme brings various stakeholders – representatives from mobile operators, technology service providers, donors and government – together to develop a strategy that addresses these mHealth barriers, especially the “lack of understanding between the mobile and development/health sectors” as pointed out by Ms. Chamberlain.

Given that each stakeholder has different organisational goals (the private sector is financially accountable to shareholders, while the government and development sectors are primarily accountable to the public), the achievement of a common position, that satisfies the accountabilities of all stakeholders to help scale-up an mHealth service, has been a challenge. The GSMA believes that an aggregated service framework (see figure 6) will make it easier for all relevant stakeholders to collaborate and will still offer a differentiated service that meets consumers’ health needs. Not only does this address the challenges brought by fragmentation, but it can also lead to stronger adoption of the service by end-users and suitable opportunities for scaling-up the service.

[4] *Visit http://www.rethink1000days.org/tag/kilkari/ for more information about Kilkari.*

Figure 6: The (proposed) aggregated mHealth service model for consumers



The assumption that the aggregated mHealth service model could be more beneficial than the current fragmented model is based on the following principles:

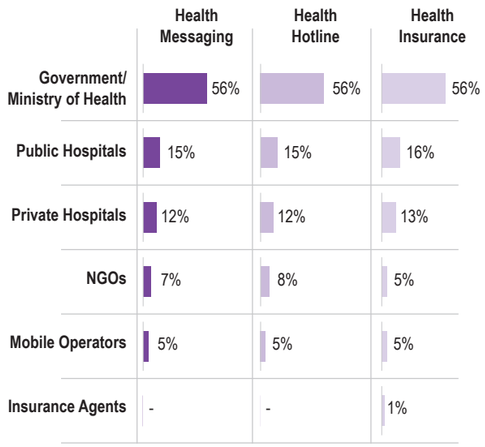
- **Focusing on strengths leads to efficiency:** each stakeholder focuses on areas that it does best, minimising operational inefficiencies and improving delivery of service.
- **Centralisation provides opportunity for cost reduction:** overall cost to run the service will be cheaper as savings can be gained through centralisation of certain processes (e.g. centralised marketing), which can then be used to take the service beyond pilot stage.
- **Aggregation sustains value for consumers:** aggregation improves accessibility, allowing consumers to acquire one or more mHealth services via a single point of contact, which can help drive service uptake.
- **Opportunity for premium upsell sustains value for operators:** operators are willing to provide cheaper/free access to basic health services as a means of enhancing value to customers and promoting use of premium-rated health services.
- **Incremental approach to roll-out allows for cross promotion and momentum:** riding on a national campaign for health promotion helped enormously with adoption and credibility for the aggregation of mHealth services.

3. Stakeholder commitments

Like any public-private partnership, the success of the aggregated mHealth service model is dependent not just on financial support but also on each stakeholder's strengths and expertise. For example, based on GSMA research in Nigeria, the government or the Ministry of Health is perceived as the most credible health provider in Nigeria (see figure 7). In addition to setting-up an essential regulatory framework, to legitimise the use of mHealth and provide investment incentives or tax benefits/exemptions, the government needs to endorse any mHealth service even if a separate entity will operate the service.

Table 8 below summarises what the GSMA believes is necessary for each stakeholder to contribute along with the potential benefits that each stakeholder receives in return.

Figure 7: Credible organisations that offer mHealth related services in Nigeria



Source: GSMA's Consumer Research: Understanding the Needs, Wants and Behaviours of Pregnant Women and Mothers in Nigeria, 2015

Table 8: Stakeholder commitments and benefits

	Government	Mobile operators	mVAS/content aggregators	NGOs/content providers
Commitments	• Validation/ endorsement of health services	• Heavily discounted access to connectivity • National subscriber reach • Direct marketing	• Commercial and technical relationships with health content and service providers • Commercial and technical relationships with mobile operators	• Expertise and provision of mHealth service • Access to health funding from development community / government
Benefits	• Channel for support of existing health interventions delivered through sustainable public-private partnership	• Access to a streamlined service line of nationally validated health services	• Access to a business model allowing it to replicate scale across countries • Access to heavily discounted access to connectivity	• Lowered costs of connectivity • Ease of technical integration • Access to national scale

The process of getting different stakeholders to commit to a programme of work often involves getting one party or sector to commit first. The GSMA worked with the two major operators in Nigeria, at group level, to secure the following commitments:

- Free dedicated USSD and SMS short codes for mHealth services for consumers and health workers
- Free access to channels for basic profiling and subscription of services for pregnant women
- Embedding of localised and approved nutrition content
- Adoption of aggregated mHealth service model for consumers
- Free and premium components within aggregated service, to drive premium up-sell ("freemium")
- Marketing of subscription services to existing and new customers, to drive adoption

This framework of suggested commitments forms the basis for negotiation with the operators at the local level.

4. Case study: Nigeria

It is possible to reach as many as 9.4 million women with an SMS-based MNCH mHealth service in Nigeria at present. The size of the addressable market can grow two-fold, reaching as many 18.8 million women, if IVR or voice channels are also used (see figure 9).

Figure 9: Size of addressable market for MNCH mHealth services in Nigeria

Channels	Literacy and phone ownership/access assumptions	2015	2020
SMS-based (only literates are reached)	Literate consumers who have own mobile phones	4.4 million	5.4 million
	Literate consumers who have access to someone else's phone	9.4 million	11.8 million
SMS- and IVR-based (both literates and non-literates are reached)	Literate and non-literate consumers who have own mobile phones	9.7 million	11.9 million
	Literate and non-literate consumers who have access to someone else's phone	18.8 million	23.6 million

Source: GSMA mHealth Team Estimates

The GSMA estimates that the actual number of users of all active MNCH mHealth services in Nigeria is only 150,000[5] women. The most successful services – Etisalat's Mobile Baby and Pathfinder International's mHealth service – had approximately 20,000 and 15,000 registered users respectively at the end of 2014.

In spite of the existence of various randomised control trials, which in most cases prove that mHealth can lead to positive health behavioural change, there is a perception that the proof that mHealth works remains insufficient. Because of the high cost and scientific rigour required to run these trials, most of them are conducted using a small sample size of control and experimental users which leads some organisations and experts to question the robustness of the analysis despite efforts to adhere strictly to statistically validated research approaches.

Unlike other mVAS such as mobile money, mHealth involves the lives of individuals and therefore requires compelling evidence that it leads to desired health behaviours with a minimal risk of potential health complications.

In order to address both the perceived lack of evidence and the lack of sustainable business models, the GSMA and various public and private mHealth stakeholders have pursued the following initiatives in Nigeria in an effort to generate support for the fact that mHealth works on a large scale (see stage 1 under table 10) and that there is a genuine interest from consumers to use mHealth services and pay for these themselves (see stage 2 under table 10).

[5] *Based on data currently in GSMA's mHealth tracker (http://www.m4dimpact.com/data/sectors/mhealth-sector) and GSMA internal projections.*

Table 10: Overview of strategy to address mHealth commercial sustainability in Nigeria

	Stage 1	Stage 2	Stage 3
Objective	**Establish credibility:** Provide a proof that mHealth works on a larger scale	**Explore commercial potential:** Provide a proof that consumers are interested in mHealth service and that they are willing to pay for these themselves	**Aggregation:** Provide a proof that Aggregated mHealth works better than Fragmented mHealth model
Initiative	**Social mobilisation of MNCH Week** using mHealth and registration of women for stage-based MNCH messaging	**Pilot commercial services:** • "Push MNCH content" (Mobile Midwife) • "Connect to a Healthcare Professional" (Dial-a-Doctor)	**Roll-out bundled mHealth services nationally:** • "Push MNCH content" (Mobile Midwife) • "Connect to a Healthcare Professional" (Dial-a- Doctor) • Nutrition messaging service • Health Insurance
Locations	MNCH Week 1: Lagos and Kano MNCH Week 2: Lagos, Kano, Imo, Delta, Bauchi and Jigawa	Country-wide	Country-wide
Implementation	MNCH Week 1: May 2014 MNCH Week 2: November 2014	October 2014	June 2015
Outcomes	Higher awareness of MNCH Week and stronger attendance (based on anecdotal evidence) among women in Lagos and Kano	Strong interest with considerable proportion of users paying for the service	NA
Number of women reached	3.6 million	40,000	NA
Channels	SMS and IVR Broadcasts	SMS, IVR, Voice	SMS, USSD, IVR, App, Voice
Aggregator	VAS2Nets	VAS2Nets	VAS2Nets
Operator	MNCH Week 1: MTN, Airtel MNCH Week 2: MTN, Airtel, Etisalat, Glo	Airtel	Airtel MTN Etisalat
Government	MNCH Week 1: FMOH Nigeria, Kano and Lagos State Ministries of Health MNCH Week 2: FMOH Nigeria, Lagos, Kano, Imo, Delta, Bauchi and Jigawa State Ministries of Health	FMOH Nigeria (Saving One Million Lives Initiative)	FMOH Nigeria
International NGO/	UNICEF, GAIN, Helen Keller International	Grameen Foundation GSMA Mobile for Development	Grameen Foundation GSMA Mobile for Development
Donor	Private Sector Health Alliance of Nigeria	BMGF, USAID and UN Foundation Innovations Working Group funded through GSMA Connected Women	-

Note: *See Appendix A for ideal services offerings for Aggregated mHealth Service.

Stage 1: Social mobilisation of MNCH Week using mHealth

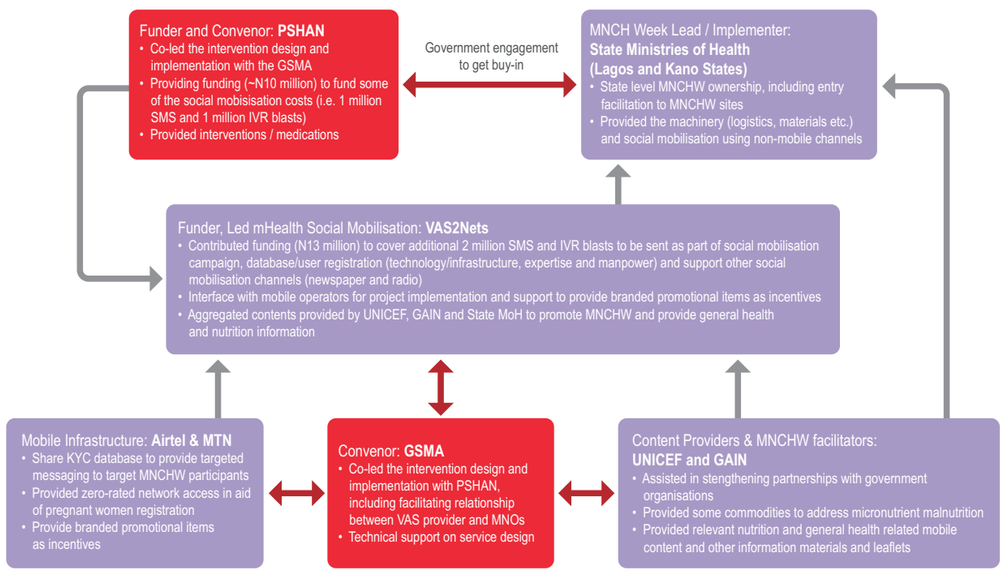
While MNCH Week has undoubtedly helped in making important healthcare interventions more accessible to pregnant women, mothers and their young children, there is a perception that a lot more could be done to increase their participation in the programme.

Dr. Elaine Ferguson of the London School of Hygiene & Tropical Medicine and her fellow researchers, who conducted a study to assess the effectiveness of MNCH Week in two states in Northern Nigeria, highlighted a number of barriers that women face when attending the MNCH Week. Some barriers are structural or difficult to resolve (e.g. distance to travel to MNCH Week delivery point, previous negative experiences at health facilities leading to women viewing MNCH Week with cynicism), whereas other barriers such as low awareness are clearly addressable. They highlighted the importance of using multiple channels for social mobilisation (e.g. radio, town criers, people in authority, community volunteers and mosques) as well as word-of-mouth among women themselves, in order to improve the awareness level of MNCH Week.

With at least two in three households having access to mobile phones in Nigeria, mHealth's potential for social mobilisation to spread information about MNCH Week has yet to be tapped. In support of the SOML's objective to leverage mHealth, the GSMA and the Private Sector Health Alliance of Nigeria (PSHAN)[6] worked together in brokering partnerships with both the public and private stakeholders in the country to explore the use of mHealth in MNCH Week's social mobilisation (see figure 11).

Through the operational leadership of VAS2Nets and with the support of the mobile operators MTN, Airtel, Etisalat and Glo, the National Primary Healthcare Development Agency and State Ministries of Health of Lagos and Kano States as well as UNICEF and the Global Alliance for Improved Nutrition (GAIN), it was decided that an information dissemination campaign to increase awareness of 2014 MNCH Week be piloted in Lagos and Kano, two of the country's most populated states. Based on mobile operators' Know Your Customer (KYC) databases, location-targeted SMS and IVR broadcasts were sent providing information about MNCH Week (e.g. what it is all about, available services, dates, specific name and location of the sites). Messages were sent a week before the actual event and every single day while it was being conducted across 400 locations in the two states[7].

Figure 11: Overview of MNCH Week 2014 stakeholder involvement in Lagos and Kano states

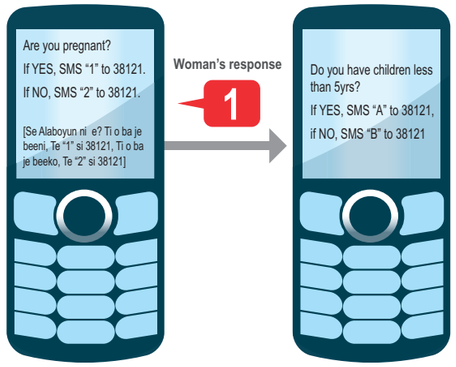


[6] *Endowed with more than $24 million, PSHAN, a collaboration between top business leaders in Nigeria (including Mr. Aliko Dangote who is considered to be Africa's wealthiest man), aims to be involved in various private-sector led initiatives that will help accelerate Nigeria's progress in achieving MDGs 4, 5 and 6 by 2015 through enabling innovation, scale and partnerships to impact healthcare outcomes.*
[7] *The women received both a text-SMS (in very simple English) and an IVR message (to address literacy issue). The IVR message was in English and Hausa/Fulani for Kano State and in Yoruba and Pidgin English for Lagos State. Voice from a popular celebrity was used to strengthen the message impact.*

Hoping to sustain the initial interaction with women beyond MNCH Week, they were continuously engaged by sending them customised messages depending on their month of pregnancy, to help improve their knowledge, behaviour and practices, with the aim of increasing ANC attendance and, eventually, positive health outcomes[8]. In order to do this, an electronic database, containing information about the targeted women, was developed. VAS2Nets took the lead in developing the necessary platforms, including the electronic database to run the registration process. Data were collected through the following methods:

- Data points from paper registration used by the healthcare workers at all MNCH Week sites, when mothers and pregnant women registered for the initiative, were extracted and sent to VAS2Nets for entry into the electronic register[9].
- Women who participated in the MNCH Week were given a zero-rated short code to send via SMS their details such as name, phone number (own number or husband/ next of kin), week of pregnancy, estimated due date, if they have a five-year-old or younger child, preferred language of communication (see figure 12)[10].

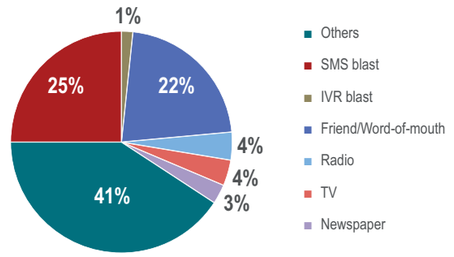
Figure 12: Illustration of SMS-based registration



A survey conducted among women attendees of MNCH Week in Lagos in May 2014 showed that 26% of women found out about the programme through the mHealth social mobilisation initiative (i.e. SMS and IVR blasts; see figure 13), illustrating that mHealth can be more effective in increasing awareness of government mHealth programmes than mass media such as radio (4%) and television (4%). However, the survey also indicated that SMS blasts (25%) were more impactful than IVR blasts (1%).

The power of word-of-mouth (22%) as well as posters at the health centres and town criers (classified under "others", which account for 41%) were also proven to be very useful in the information dissemination of MNCH Week.

Figure 13: Awareness drivers for May 2014 MNCH Week in Lagos



While the financial contributions from PSHAN and VAS2Nets have been valuable in the actual deployment of the SMS and IVR broadcasting to promote MNCH Week (see table 14), a formal monitoring and evaluation process to measure the actual impact of mHealth social mobilisation on actual participation of women in the programme and whether those who registered to receive the stage-based messaging service sustained their access to vital ANC at their primary healthcare centres has not been conducted.

Table 14: Financial contributions of PSHAN and VAS2Nets in MNCH Week mHealth social mobilisation in Kano and Lagos states

	Contribution	Value
Donor: Private Sector Health Alliance of Nigeria	Fee for accessing operator KYC database; Bulk SMS, IVR broadcasts	NGN 10 million (~US$50,000)
VAS/content aggregator: VAS2Nets	SMS broadcast; fee for accessing operator KYC database; platform development for broadcast integration; short code set-up fee and delivery charges for zero-rated short code; OBD broadcast interface, recruitment of field agents to monitor at some sites in Lagos	NGN 13.3 million (~US$66,000)

[8] *Women received two messages monthly until the following MNCH Week. The database to be delivered to the State repository was to be used by the State MoH to send alerts/invites to ANC and for follow up visits.*
[9] *Information extracted were name, telephone number, number of children, whether pregnant or not, stage of pregnancy and expected date of delivery (EDD).*
[10] *Every woman who attended the MNCH week was sent a zero-rated short code which they could reply to using their own or someone else's phone to register their details [name, phone number of woman or husband/next of kin, whether pregnant and EDD, if they have U5 year old child, preferred language of communication] via SMS. Healthcare workers and women in both Lagos and Kano were educated and informed of this process to encourage women to register via the mobile platform.*

The use of mHealth in MNCH Week social mobilisation in Kano and Lagos has achieved the widest reach among the mHealth social mobilisation engagements that VAS2Nets has participated in to date (see table 15) and, as illustrated above, can be more effective in increasing awareness of government mHealth programmes than mass media such as radio and television.

Table 15: Programmes where mHealth has been used by VAS2Nets for social mobilisation

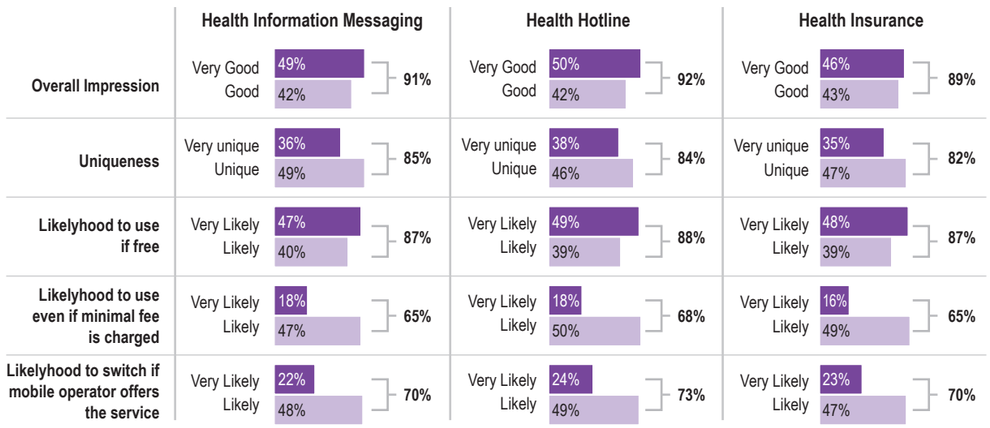
Initiative	Health focus condition	Date launched	Frequency	Regions	Number of women reached
MNCH Week 2014	MNCH	May and November 2014	Bi-Annual	Kano and Lagos	3.6 million
Mobile sensitisation to women	MNCH / Nutrition	November 2014	One-off	Zamfara and Jigawa	32,000
Breastfeeding Week	MNCH	August 2014	Annual	Abuja	1,100
Sure-P mCCT MCH	MNCH	December 2014	Monthly	Abuja	600

Stage 2: Pilot commercial services: Mobile Midwife and Dial-a-Doc

According to research conducted by the GSMA in Nigeria, there is a strong interest in mHealth services. Approximately 9 in 10 of the targeted women are interested in using the services, assuming that they are being offered free-of-charge. Two-thirds are willing to use the service even if a minimal fee is charged to access the service (see figure 16).

From October until December 2014, VAS2Nets piloted Mobile Midwife and Dial-a-Doctor in Nigeria. Consistent with the findings from GSMA research, there was strong interest among women in these regions for Mobile Midwife and Dial-a-Doctor. Twenty-one thousand (21,000) women have registered for Mobile Midwife and 19,000 have trialled Dial-a-Doctor since their launches in October 2014.

Figure 16: Concept testing: Overall impression, uniqueness, likelihood to use and likelihood to switch



Source: GSMA's Consumer Research: Understanding the Needs, Wants and Behaviours of Pregnant Women and Mothers in Nigeria, 2015.

Note: Refer to Appendix B for the description of each of the services.

Respondents were asked to rate the concepts based on the criteria/attributes above using a 5-point scale. The figures shown are for the proportion of the respondents who rated the concepts with the top-2 (box) rating.

Mobile Midwife: Funded by the BMGF, USAID and UN Foundation Innovations Working Group through the GSMA Connected Women Programme to Grameen Foundation, Mobile Midwife delivers stage-based MNCH information services containing health and nutrition information targeting pregnant women and new parents in their local language. Information provided includes alerts and reminders for care-seeking (e.g. reminders to go for ANC), how to deal with challenges during pregnancy (e.g. what is needed for a birthing kit) as well as educational information, including milestones in foetal development and promotions of good health practices such as breastfeeding.

There are two types of packages:

- **Basic:** To subscribe and register, users dial a short code number (*1561#). On registration, users receive messages via IVR and an additional five SMS messages every week, with information tailored to their stage of pregnancy or the age of the child until he/she reaches the age of one. The basic package costs NGN 30 (US$ 0.15) per week.
- **Premium:** A user can also call into a premium number allowing access to a conference room and chat with a doctor and other women discussing maternal and child-related issues and sharing experiences. Alternatively, a user can also receive one-on-one medical advice from a doctor. As such the premium Mobile Midwife services is associated with the Dial-a-Doctor service. Initially charged at NGN 50 (US$0.25) per minute during the service launch, the premium Mobile Midwife service is now being offered at NGN 30 (US$ 0.15) per minute to increase the service uptake and align its pricing with that of Dial-a-Doctor.

Overall, the user feedback on Mobile Midwife has been positive, and can be summed up by the testimonial of one subscriber: "(it was *a) great experience because it has really helped me to know a lot about healthy nutrition and also (on how to) care for baby after birth."*

Dial-a-Doctor: Costing NGN 30 (US$ 0.15) per minute, Dial-a-Doctor is a 24/7 health hotline service which allows users to speak to healthcare professionals such as doctors, dentists, nutritionists, optometrists, psychologists, psychiatrists and family planning specialists[11]. While the premium Mobile Midwife targets pregnant women, Dial-a-Doctor is targeted towards the general population, providing wellness and first-aid advice. If a doctor recognises that a patient on the phone requires further medical attention, the user is immediately referred to a hospital. In the case of an emergency, the doctor calls for an ambulance from the nearest hospital to pick the customer up from his/her home.

[11] Upon dialling 67777, a user is connected to the Dial-a-Doctor IVR system for free and is only charged NGN 30 per minute once the actual consultation (via voice) with the healthcare professional begins.

Stage 3: National roll-out of bundled mHealth services

Given the initial success seen in stages 1 and 2 of this initiative, VAS2Nets has partnered with GSMA Mobile for Development mHealth, Airtel and other stakeholders to enhance its mHealth services by applying the mHealth aggregated service model in its mHealth product strategy – nutrition messaging and health insurance will be bundled with Mobile Midwife and Dial-a-Doctor from June 2015 (see figure 17) with the aim of offering other mHealth services in the future depending on the capabilities of future content partners and market opportunities as demanded by consumers.

The offering of a premium mHealth service, as a potential differentiator, has attracted other operators in Nigeria who will join this initiative and offer the bundled mHealth service in the near future.

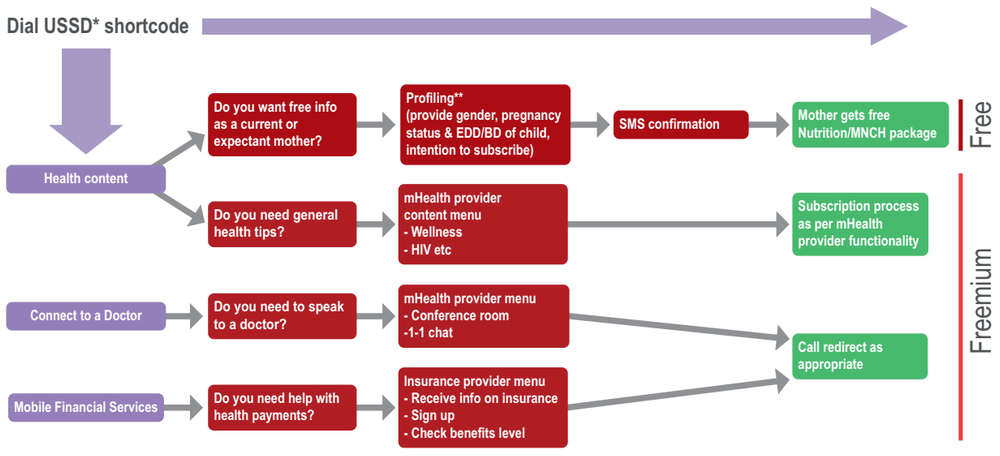
Through the aggregated service model, various mHealth services along with content will be aggregated by one to two VAS aggregators, allowing mobile operators to focus on their core competencies (the marketing and distribution of services) and to choose specific components that fit with their mHealth strategies and differentiate their services from those of their competitors. Pricing-wise, the aim is to entice consumers to use basic and free services and familiarise them with various value-added but premium services, the revenue from which will help subsidise the cost of running the basic services.

VAS2Nets and Airtel are optimistic with the business prospects from this bundling strategy. VAS2Nets estimates that the service will have approximately 1.6 million users by the end of 2017 (see table 18).

Table 18: Projected number of users of the aggregated mHealth service model

	2015	2016	2017
Mobile Midwife	65,000	320,000	525,000
Dial-a-Doctor	65,000	525,000	1,050,000
Nutrition messaging	20,000	22,000	25,000
TOTAL projected users	150,000	867,000	1,600,000

Figure 17: Customer journey for aggregated mHealth service model



Marketed by: operator
Branded: at operator's discretion
Endorsement and awareness building by: government and health partners
Technical aggregator /VAS: at operator's discretion

*USSD to start with, but depending on operator commitment and operational realities in county, might extent to SMS or IVR
**USSD to start with, but depending on operator commitment and operational realities in county, might extent to Call Centre-based profiting

5. Business case analysis

Accountability to shareholders means that private sector organisations require business case justification when investing in a project or initiative that requires significant financial or human resource investment. Given the various challenges that the mHealth industry is facing, the scale-up of any mHealth service has been a challenge. Without concrete proof that private organisations can make a reasonable return on their investments, most of them limit involvement in mHealth to Corporate Social Responsibility initiatives.

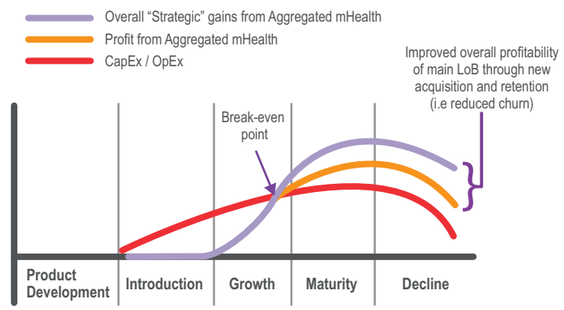
GSMA interviews with mHealth stakeholders have indicated that the measure of a "reasonable return" varies from one organisation to another. There are organisations, for example, whose management has set a certain level of internal rate of return (IRR) over a fixed short period of time, while others measure the return based on more strategic, longer-term prospects such as identification of alternative but sustainable sources of revenue (i.e. diversification).

Rolling-out the aggregated mHealth service nationally across Nigeria as described in stage 3 above requires considerable investment on the part of both Airtel and VAS2Nets, not just in terms of capital expenditure but also in terms of operational expenditure, which is essential as part of their commitment to offer the service beyond a one to two-year time frame. According to VAS2Nets, this has actually been one of their largest investments to date.

Given the sensitivity of commercial and operational information for this initiative, the information that can be published in this paper is limited in scope. However, the concept can be illustrated graphically in figures 19 and 20 below and demonstrate what Airtel and VAS2Nets are expecting to gain commercially by launching the aggregated mHealth service in Nigeria.

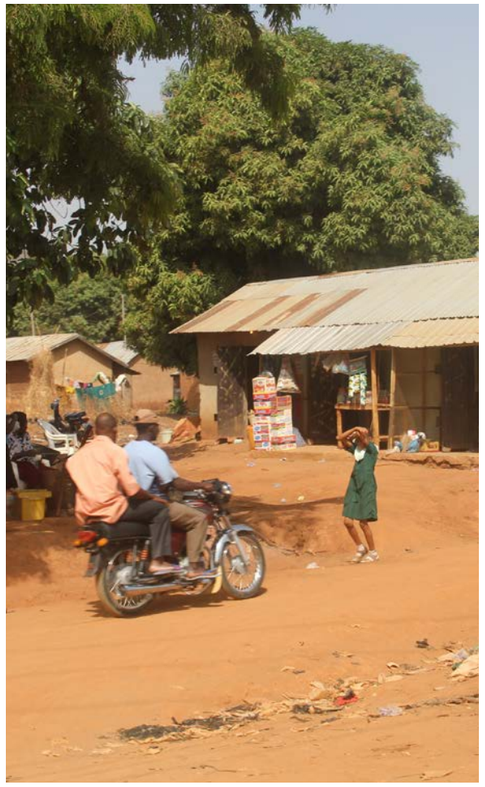
Airtel Nigeria: Airtel does not expect considerable financial gains from this initiative although it does expect revenue that is sufficient to cover operational expenses. Airtel sees this as a strategy to differentiate its service from competitors and aims to create an effective customer acquisition and retention strategy, which will strengthen the main lines of business (e.g. voice, SMS and data) in the short-term and upsell data and other value-added services (both health and non-health) in the medium- to long-term.

Figure 19: Graphical representation of Airtel's business case for launching the aggregated mHealth service



"Airtel's eyes were opened and we realised how valuable mHealth could be when we got involved in the Ebola campaign to provide information dissemination on how to prevent the spread of the disease. Moreover, the results of the pilot of Mobile Midwife and Dial-a-Doctor provided some evidence that there are commercial opportunities from mHealth although we are looking beyond short-term financial gains. Besides our desire to contribute in helping improve the nutrition and general health of Nigerians across the country, we also aim to differentiate our service versus those of our competitors, hoping that this aggregated mHealth service would help bring new customers to the network or improve loyalty/reduce churn among our current subscribers."

- Francis Ebuehi, the VP of VAS of Airtel Nigeria



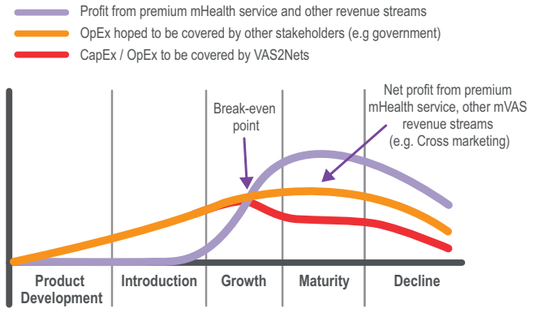
VAS2Nets: Having been involved in various mHealth initiatives previously, VAS2Nets believes that mHealth has a role not just in promoting government health programmes but also in achieving positive health behavioural change. This is the key reason why VAS2Nets has been proactive in getting involved in non-commercial mHealth initiatives as indicated in table 15 above.

Like Airtel, VAS2Nets looks beyond the short-term and believes that investment is crucial, not only to address the country's general health and MNCH-related challenges, but also to help create commercial sustainability for mHealth in Nigeria. Belief in the potential of the aggregated mHealth service had led VAS2Nets to invest more than US$380,000 to roll-out Mobile Midwife, Dial-a-Doctor, mNutrition and health insurance across the whole country.

VAS2Nets believes that a strategy of offering basic services for free (e.g. nutrition) and premium services at a charge (e.g. Mobile Midwife, Dial-a-Doctor and health insurance) will broaden the appeal of the service among a wider segment of socio-economic classes, eventually leading to the up-selling of other premium non-mHealth VAS, including the use of mobile money.

While the upside potential from this model is high, downside risks persist despite strong interest from consumers during the pilot stage (stage 2). VAS2Nets hopes that support will be forthcoming from government, not just in terms of endorsement but potentially also in the provision of funds to help cover any operational expenses, as well as from the private sector, in the form of advertising or cross-marketing opportunities – i.e. promotional products that are relevant to mothers and pregnant women will be provided by consumer packaged goods companies to increase trial and uptake of the mHealth service.

Figure 20: Graphical representation of VAS2Net's business case for launching the aggregated mHealth service



"VAS2Nets has supported various mHealth initiatives, whether they provide financial return or not, because we believe the value that mHealth can bring to the Nigerian society. However, we believe that it is crucial for both the public and private stakeholders like us to collaborate together not only in launching the Aggregated mHealth Service but also in identifying various ways to finance the service to ensure its long-term sustainability. We understand that BoP consumers, for example, have limited ability to pay so we hope that the public sector will contribute to the funding of the service and that the private sector will help us develop creative means of financing, perhaps through cross-marketing opportunities."

- Ms. Teniola Stuffman, VAS2Net's Business Development Director for Africa and Europe

6. Conclusion

The original remit of the mHealth programme was to discover ways in which mHealth can be scaled and made sustainable over time. However, there are many definitions of scale and sustainability and part of the objective of the mHealth programme was also to locate a definition of scale and sustainability that was meaningful in the context of the country's specific needs.

In Nigeria, where the GSMA has had the most visible success, scale is defined by the degree to which mHealth was used in the context of a large and visible national programme. MNCH Week, by virtue of its coverage, represented the single largest health intervention via mobile that had been carried out in the country, covering the two most populous states (Lagos and Kano). The fact that it was carried out by an unprecedented collaboration between the commercial mobile industry (Airtel, MTN and VAS2Nets), the health sector (SURE-P MCH, Kano and Lagos state governments and the Federal Ministry of Health) and the private sector (the Private Sector Health Alliance of Nigeria) is testament of the potential of public-private partnerships between the health and mobile sectors. Sustainability is defined as the state by which such large-scale interventions can be funded on an ongoing basis without reliance on external donor funding. As mentioned above, it is not possible (for commercial reasons) for entities to reveal their exact cost and revenue structures. However, the closest proxy indicator that can be used is the degree to which commercial entities such as Airtel and VAS2Nets will continue to pursue mHealth, funding their investments in activities such as MNCH Week from their commercial marketing budgets, in order to drive demand for their commercial activities – which can either come from direct revenue from their revenue generating mVAS (Mobile Midwife, Dial-a-Doctor) or indirect commercial revenue in terms of driving consumer acquisition and retention. Both organisations have committed to support MNCH Week on an ongoing basis, expanding the scope to four more states in Nigeria.

Both models demonstrate that scale and sustainability mean different things in different countries and to different stakeholders. However, in both cases, a path has been found to increase coverage of health content distribution to BoP consumers, in a way that does not involve direct investment from the donor and government sector, and as part of a broader strategy that ties in with the long-term commercial aims of the mobile sector.

In helping to facilitate this process in Nigeria, the GSMA has discovered that the following activities have been critical in the creation of a partnership between both sectors:

- Identification of suitable partners from both the health and mobile sectors, for collaboration based on objective indicators of potential and interest.
- Creation of environments for collaboration and conversation between the two sectors, either through stakeholder engagement sessions such as the community of practice or facilitated one-on-one joint product development sessions.
- Development of research and publications which help the stakeholders market the concept and value of collaboration to senior management.
- The securing of visible and significant commitments from both the mobile sector and the health sector that demonstrate the value of collaboration on both sides.

The path ahead for Nigeria now involves capitalising on the momentum already created within the first 18 months of the programme. The next step is to bundle both the free-to-consumer messaging elements as well as the commercial elements of the services already launched as an aggregated service, so that the mobile sector can fully appreciate the cross-sell and upsell opportunities that mHealth can provide and through those opportunities provide an ongoing platform for sustainability.

Appendices

Appendix A: Ideal services offerings for the aggregated mHealth service

1. **Nutrition health service** – target users will be profiled and sent a package of relevant, stage-based messages on nutrition which have been endorsed by government.

2. **General health content (push)** – users will be able to choose from a selection of health topics (endorsed by government) to subscribe to, which will then be pushed to them on a regular basis via SMS or other channels.

3. **General health content (pull)** – users will be able to browse among specific health topics of interest on demand. This can include either information on health topics, or information regarding accessing health e.g. locations of clinics, health policies, etc.

4. **Connect to a professional** – users will be able to connect to a healthcare professional who will be able to provide bespoke advice.

5. **Mobile financial services** – users will be able to access mobile financial services, whether health-related or otherwise.

Appendix B: Description of the concepts tested

Service Idea 1 : Health Information Messaging

An information service that aims to provide up-to-date and interesting information and tips on health and nutrition-related topics. Messages are received on a user's mobile phone on a weekly basis.

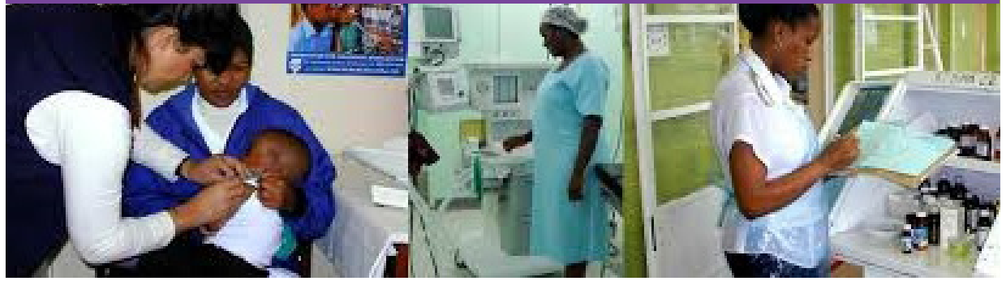
Respondents can choose from three options in terms of content: (1) pregnant women, (2) newborn/babies and (3) child health and nutrition information.

Service Idea 2 : Health Hotline

The health hotline service allows the user to access a reliable doctor 24 hours a day, 7 days a week, regardless of location. The user can call a qualified medical professional for trusted information.

Subscription is in the form of a fixed monthly fee that is deducted from the user's mobile credit or top-up.

Service Idea 3 : Health Insurance (on Mobile)



Health insurance on Mobile is a health insurance scheme paid for via mobile.Subscription is in the form of a fixed monthly fee that is deducted from the user's mobile credit or top-up.

Abbreviations

ANC	Antenatal Care
BBC	British Broadcasting Corporation
BMGF	Bill and Melinda Gates Foundation
BoP	Bottom of the Pyramid
EDD	Expected Date of Delivery
FMOH	Federal Ministry of Health
GAIN	Global Alliance for Improved Nutrition
ICT	Information and Communications Technology
IVR	Interactive Voice Response
KYC	Know Your Customer
MDG	Millennium Development Goals
MMR	Maternal Mortality Rate
MNCH	Maternal Newborn and Child Health
mNutrition	mobile Nutrition
mVAS	mobile Value Added Services
PSHAN	Private Sector Health Alliance of Nigeria
SOML	Saving One Million Lives
SMS	Short Message Service
SSA	Sub-Saharan Africa
U5MR	Under-5 Mortality Rate
UNICEF	United Nations Children's Fund
USAID	United States Agency for International Development
USSD	Unstructured Supplementary Service Data
WHO	World Health Organization

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About the GSMA

The GSMA represents the interests of mobile operators worldwide, uniting nearly 800 operators with more than 250 companies in the broader mobile ecosystem, including handset and device makers, software companies, equipment providers and Internet companies, as well as organisations in adjacent industry sectors. The GSMA also produces industry-leading events such as Mobile World Congress, Mobile World Congress Shanghai and the Mobile 360 Series conferences.
For more information, please visit the GSMA corporate website at www.gsma.com.
Follow the GSMA on Twitter: @GSMA.

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GSMA Mobile for Development brings together our mobile operator members, the wider mobile industry and the development community to drive commercial mobile services for underserved people in emerging markets. We identify opportunities for social, economic impact and stimulate the development of scalable, life-enhancing mobile services.
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About GSMA Mobile for Development mHealth
The GSMA Mobile for Development mHealth programme brings together the mobile industry and health stakeholders to improve health outcomes in emerging markets, with initial focus on Millennium Development Goals 4, 5 and 6 across Africa. The programme convenes key stakeholders using many forums including working groups and workshops, as well as providing resources and support to identify partnership opportunities to bring mHealth solutions to scale.

For more information on the GSMA's Mobile for Development mHealth programme - mhealth@gsma.com
http://www.gsma.com/mobilefordevelopment/programmes/mhealth

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