MOMCONNECT:
Launching a National Digital Health Program in South Africa
Acknowledgements

As part of a series led by the Innovation Working Group (IWG) mobile health (mHealth) grant program, this case study aims to illustrate the process, partnerships, and sustainability model of a scalable digital health solution, in addition to outlining challenges faced and key lessons learned. South Africa’s MomConnect program was selected because it serves as an excellent example for other countries and demonstrates how a national department of health-led initiative has managed to scale-up and deliver successful results.

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<td>Antenatal care</td>
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<tr>
<td>CHW</td>
<td>Community health worker</td>
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<tr>
<td>DHIS2</td>
<td>District Health Information System Version 2</td>
</tr>
<tr>
<td>FAQ</td>
<td>Frequently asked questions</td>
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<tr>
<td>HIS</td>
<td>Health information system</td>
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<tr>
<td>J&amp;J</td>
<td>Johnson and Johnson</td>
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<tr>
<td>LMIC</td>
<td>Low and middle-income country</td>
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<td>mHealth</td>
<td>Mobile health</td>
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<td>MAMA SA</td>
<td>Mobile Alliance for Maternal Action in South Africa</td>
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<tr>
<td>MDG</td>
<td>Millennium Development Goal</td>
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<tr>
<td>NDoH</td>
<td>National Department of Health</td>
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<tr>
<td>NGO</td>
<td>Non-governmental organization</td>
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<td>NPR</td>
<td>National Pregnancy Register</td>
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<td>OGAC</td>
<td>Office of the U.S. Global AIDS Coordinator</td>
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<td>OpenHIE</td>
<td>Open Health Information Exchange</td>
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<td>OpenHIM</td>
<td>Open Health Information Mediator</td>
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<tr>
<td>SIM</td>
<td>Subscriber Identity Module</td>
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<tr>
<td>SMS</td>
<td>Short messaging service</td>
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<td>UNDP</td>
<td>United Nations Development Program</td>
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<td>UNF</td>
<td>United Nations Foundation</td>
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<td>USAASA</td>
<td>Universal Service and Access Agency of South Africa</td>
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<td>USAID</td>
<td>United States Agency for International Development</td>
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<tr>
<td>USSD</td>
<td>Unstructured Supplementary Service Data</td>
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<tr>
<td>WHO/RHR</td>
<td>World Health Organization Department of Reproductive Health and Research</td>
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<tr>
<td>WRHI</td>
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Executive Summary

South Africa has high infant mortality rates and maternal mortality rates at 29 per 1,000 live births and 140 per 100,000 births respectively. To reduce these rates, the South Africa National Department of Health (NDoH) is leading the charge to tackle the health challenge from all angles, including educating and providing quality healthcare to infants and mothers.

One component of these efforts is MomConnect. MomConnect is a program that is implemented via mobile phone. The comprehensive system registers pregnant women, delivers targeted stage-based health information to pregnant and postpartum women, enables women to reach out with pressing questions, and establishes an important feedback loop to improve services at healthcare facilities. MomConnect is offered free-of-charge to mothers and caretakers. The initiative is funded and implemented through a network of over 20 partner nongovernmental organizations (NGOs), the NDoH, and international donors.

This case study explores how MomConnect, under the South African NDoH leadership, was able to scale-up and reach over 700,000 registrants across South Africa in its first year. Through this case study, we learn how the government was able to leverage existing programs and partners and unite them to work together towards one solution; which technologies were considered to best help scale; and how the technology solution integrates with other healthcare platforms in order to share information with the institutions that need it. The case study also discusses challenges and risks to sustainability and scaling-up.

The program is an example of a digital health solution in a low-and-middle income country (LMIC) to scale-up. The investments made through MomConnect, including implementation of the Open Health Information Mediator (OpenHIM) software program based on the Open Health Information Exchange (OpenHIE) global open source collaboration, have helped improve interoperability among South Africa’s health information systems (HIS) and generated momentum for additional digital health services and policies. MomConnect’s reach in South Africa makes it an ideal platform to launch an extensive suite of health-related services that would improve the South African healthcare system beyond maternal and infant health.
MomConnect is a digital health program that registers pregnant women, delivers targeted stage-based health information to pregnant and postpartum women, enables women to reach out with pressing questions, and establishes an important feedback loop to improve services.

In February 2014, Dr. Aaron Motsoaledi, South Africa’s Minister of Health, faced a crucial deadline. The year 2015 was right around the corner, and it was clear that South Africa would unlikely be able to meet the Millennium Development Goal (MDG) targets set for decreasing maternal and infant mortality rates. Feeling the pressure of missing global targets, Dr. Motsoaledi needed a large-scale, nationwide response to prevent avoidable maternal and infant deaths. With mobile phone subscriptions increasing in penetration compared to traditional communication mediums like television and radio,1 using mobile technology to reach pregnant women across the country presented an enormous opportunity.

Over the past several years, NDoH, along with its NGO partners had supported small pilot projects utilizing digital technology to solve health challenges; nevertheless developing national scale digital health interventions had remained largely elusive. Drawing upon lessons learned and systems developed from past studies and pilot programs, the NDoH led a coalition of public and private partners to develop the MomConnect program.

MomConnect is a digital health program that registers pregnant women, delivers targeted stage-based health information to pregnant and postpartum women, enables women to reach out with pressing questions, and establishes an important feedback loop to improve services. With a reach of over 700,000 registrants across South Africa, the program is one of the few digital health solutions in a low-and-middle income country (LMIC) to scale at the national level.2, 3, 4 It is an exemplary illustration of a multi-partner effort steered by strong government stewardship and a clear vision.
MomConnect is one in a series of interventions introduced by the Minister of Health to reduce maternal and infant mortality. Other interventions included introducing pneumococcal and rotavirus vaccines for infants, training midwives, and developing devices such as continuous positive airway pressure machines for infants at risk of lung collapse. Together these interventions are responsible for making an impact on improving maternal and infant health in South Africa.

THE CHALLENGE: LOWER MATERNAL AND INFANT MORTALITY RATES

Every year in South Africa there are approximately 1.17 million births. Unfortunately, maternal and infant mortality remain a persistent problem and too many suffer preventable deaths. South Africa’s infant mortality rate is 29 per 1,000 live births as of 2013, and above the United Nations Development Program’s (UNDP) MDG4 goal of reducing infant mortality to 18 deaths or less for every 1,000 live births by 2015. One reason for the high infant mortality rate is because of HIV transmission from mother-to-child. Each year, about 300,000 babies are born to HIV-positive women and as many as 40% of infants could contract HIV during the mother’s pregnancy or during delivery if prevention of mother-to-child transmission services are not sought. Equally alarming, there are 140 maternal deaths for every 100,000 live births, far exceeding the MDG5 2015 target of 38 or fewer maternal deaths for every 100,000 live births.

Lowering maternal and infant mortality rates requires a multi-pronged approach, from increasing education to improving the quality of healthcare services. The primary challenges the NDoH faced were: How could the NDoH educate pregnant women and mothers of newborns on how to care for their own health as well as the health of their infant? How do they reach women at the early stages of their pregnancies? How can they improve services from healthcare providers to ensure quality care?

With a target market of nearly 1.2 million pregnant women, the NDoH needed to determine the best delivery mechanism to effectively reach those women to provide vital healthcare information. The solution? A comprehensive digital health program.

AN INNOVATIVE DIGITAL HEALTH PROGRAM: SCALABLE, TARGETED, AND TRACKABLE

South Africa’s telecommunications sector is one of the most advanced in Africa and its mobile penetration rates indicate that mobile phones would provide the largest network through which to connect with pregnant women and new mothers. At the end of 2014, the penetration rate of the mobile phones, Internet and fixed lines markets in South Africa were 154%, 53% and 7% respectively. Unlike other countries in Sub-Saharan Africa, women are just as likely as men to own a cell phone. Among low-income earners, even if a woman did not own a mobile phone, she could potentially share a phone with someone in her household. Given the high literacy rates in South Africa (94% of adults are literate) and that texting is the most common activity on a mobile phone, text messaging is an appropriate way for a digital health program like MomConnect to engage with the target population.

Furthermore, mobile technology offers significant advantages such as the ability to deliver direct, targeted and personalized messages to the woman at the right stage of her pregnancy or the infant’s life. Through a mobile phone, data could also be collected and tracked on a platform, which would aid in monitoring a woman’s or infant’s health.

Other forms of mass communication such as television ads, billboards and brochures have a role to play in marketing a potential solution, but they are less effective media in terms of delivering information. Tracking would be difficult, in addition to being too expensive to be practical. Spending on marketing and advertising budgets would have to be high in order to accommodate the large volume of information that would need to be conveyed.
THE ROAD LEADING UP TO MOMCONNECT

Given its robust mobile usage, South Africa has been a hotbed for small-scale digital health pilot programs. Through implementing these programs, healthcare providers and operators have invested in developing technical platforms and building content banks that could be repurposed. They have gained transferable user insights and operational expertise. The products, skills and know-how that many organizations amassed over years of testing digital health solutions in South Africa were eventually leveraged in the design and implementation of MomConnect.

MomConnect first began in 2012 as a project between the Praekelt Foundation, Jembi Health Systems, UNICEF and the NDoH. MomConnect has built on the success of the Mobile Alliance for Maternal Action in South Africa (MAMA SA)18, which has provided education to women on antenatal care and how to have a healthy pregnancy and healthy infant. It has also supported HIV-positive mothers and provided information on how to prevent mother-to-child HIV transmission.19

MAMA SA is a consortium of organizations including the United States Agency for International Development (USAID), the Praekelt Foundation, Cell-Life, Wits Reproductive Health & HIV Institute (WRHI), Johnson & Johnson (J&J) and others. Together, they launched a strategy to engage and empower pregnant women and new mothers to make healthy decisions for themselves and their children. Between 2012 and 201420, MAMA SA developed programs across three mobile channels, each targeted to reach women from different income brackets: short messaging service (SMS), Unstructured Supplementary Service Data (USSD), and a mobile website to deliver maternal health information.

THE PROGRAM: KEY COMPONENTS AND PROCESSES

Building upon past lessons and successes, the NDoH officially launched MomConnect as a service in August 2014. Key lessons from MAMA SA and other programs informed MomConnect’s main components:

- A back-end system that integrates into the District Health Information System Version 2 (DHIS2) and configures the National Pregnancy Register (NPR).
- A front-end system that registers pregnant women and using USSD allows them to browse through Frequently Asked Questions (FAQs) and databases and delivers stage-based health information via SMS up to a child’s first birthday.
- An anonymous SMS helpline to share feedback to the NDoH and ask questions.
- A service ratings survey to rate the woman’s experience at the clinic during her visit.
- National Pregnancy Register: Data collected by MomConnect is sent to the South African NPR. Typically a woman registers for MomConnect during a visit to a health care clinic.21 However, she could also subscribe herself using the USSD system or through a Community Health Worker (CHW). If this is the case, the woman would then receive six “tester” messages that encouraged her to visit a clinic to confirm the pregnancy, receive antenatal care (ANC), and register to access the full suite of features. The system ensures data accuracy by using unique identifier codes to help prevent duplicate entries in the register.22

- Stage-based Health Information Delivery: MomConnect provides valuable knowledge to expectant and new mothers. It offers guidance on how to have a healthy pregnancy and birth and how to give quality childcare. Each week, users receive two messages that are personalized depending on their pregnancy stage or child’s age. The MomConnect program leveraged extensive research by MAMA SA to determine the content that would be provided and combined this with NDoH messaging. Medical professionals, mothers and local partners were consulted and the NDoH reviewed the content to ensure it met the department’s objectives and guidelines.
Examples of topics covered in the messages include:

- Nutrition
- HIV/AIDS
- Hypertension
- Breastfeeding
- Immunization
- Mother-child bonding

**SMS Helpline:** In order to achieve its objective of improving maternal and infant healthcare, MomConnect built in an FAQ and SMS helpline feature where users can ask questions anonymously. Users can also enter in lengthier comments and qualitative feedback on issues such as quality of services received. Every month, MomConnect gathers the user feedback and sends it to the provincial health department heads, and district focal persons who can then address specific complaints and work on improving services at healthcare facilities.

**Service Ratings and Feedback:** Newly registered women can opt-in to complete a feedback survey to rate the clinic on a scale from one to five on five items: cleanliness, friendliness, privacy, length of waiting time, and feel of waiting time. The data is used to rate the clinic overall and provides additional information to administrators who can use the data to improve the facility’s services. The helpline and feedback component are essential because healthcare facilities are now able to get this feedback from patients directly, rather than having to rely on staff or a third party.

MomConnect’s services are free for women, which reduces barriers to access. The platform allows for anonymity through USSD FAQs, therefore the helpline gives a sense of safety and privacy to women in what is often a stigmatized domain. Further, the service helps provide agency and power to women over the course of their pregnancies.
MomConnect has over 20 partners from the public and private sectors that each add value to the program and are critical in supporting the value chain.

THE PLATFORM: LEVERAGING MOBILE AND DATA INFRASTRUCTURE

In the course of executing MomConnect’s mission and objectives, the team, comprised of approximately 40 people from across MomConnect’s partners, developed a valuable and scalable healthcare technology tool. The platform is able to acquire and manage a large amount of data, while distributing relevant and customized information to users and healthcare workers.

- **Infrastructure development:** The team was responsible for building the technology product, executing a communication strategy, and implementing the program. In order to do so, the team had to piece together all the relevant actors along the value chain and develop solutions that would connect their activities together. Among the many challenges, the team is credited with solving several technical issues including creating scalable coherent clinic codes, determining how to train thousands of health workers in a system that is updated every six months, and getting technology in the hands of all the CHWs.23

- **Data management protocols:** Managing data movement and privacy concerns were key priorities for the MomConnect team. This meant ensuring data collected from multiple sources was integrated into DHIS2. Further, a national unique clinic identification system had to be established to track registrations and classify data collected. By assigning a unique code to every clinic in the country, it allows the NDoH and partners to analyze data collected from the aggregate to the individual clinic level. To govern data flows across partners and systems, MomConnect partners developed a data transfer and data privacy protocol. To store the data collected, an external solution to safely host the data had to be identified since the NDoH did not have the server capacity.

- **Open Health Information Exchange (OpenHIE):** To facilitate the integration between the SMS platform with DHIS2, the team had to create an interoperability layer. MomConnect uses OpenHIM which is software based on the OpenHIE global initiative that allows existing platforms to “talk” with each other. This software essentially connects multiple data sources to a single source and allows for easy information sharing.

BUILDING VALUABLE PARTNERSHIPS

MomConnect has over 20 partners from the public and private sectors. While the large number of partners may initially seem unwieldy and could create organizational conflicts, they each add value to the MomConnect program and are critical in supporting the value chain.
MOMCONNECT PARTNERS

SOUTH AFRICA NATIONAL DEPARTMENT OF HEALTH

Strategy
ICF International
CSIR

Technology
Jembi
Praekelt Foundation
HISP

Content
Soul City
WRHI
HealthEnabled
MAMA SA
Baby Center International

Funding
PEPFAR
Johnson & Johnson
ELMA Philanthropies
Discovery Foundation

Training
PEPFAR District Support Partners*

Mobile Network Operators
Vodacom
GSMA
MTN
Cell C
Telkom

Monitoring & Evaluation
University of Western Cape
Stellenbosch University

* PEPFAR District Partners include the following organizations: Anova, Foundation for Professional Development, Broadreach, Health Systems Trust, Aurum Institute, Right to Care, Beyond Zero, Africare, Path, Kheth’ Impilo, Match, and WRHI.
One of the reasons that the program requires so many partners is because the government wants to leverage the unique contribution and capacity of each partner. The NDoH took the lead in the overall direction of MomConnect and convened and coordinated the various partners. The NDoH invited specific organizations with the capacity and experience to work with the government on a national scale and the ability to execute and provide resources as needed.

**DELIVERING VALUE TO MULTIPLE STAKEHOLDERS**

MomConnect relies on numerous partners to deliver its services. At every stage along the value chain, each partner is able to add value and plays a critical role in delivering MomConnect services.

In addition to contributing to MomConnect, some of these partners gain tremendous value from the program itself. The following are examples of MomConnect’s value proposition for specific partners:

- **Value for healthcare service providers:** Healthcare service providers are able to receive feedback in order to improve their services. Without MomConnect, the providers would have to invest their own time and money into building and conducting surveys for user feedback. Through MomConnect’s feedback, providers can be informed of potential issues and take steps to improve their services.

- **Value for end-users:** For pregnant women and mothers who lack access to information, MomConnect serves as a virtual guidebook. Through a comprehensive end-to-end program, MomConnect delivers knowledge that helps women have a healthy pregnancy and care for their child through their first birthday. The service is free and messages are personalized and delivered directly to mobile phones.

- **Value for government and donor community:** MomConnect is a centralized large-scale project that is able to deliver services nationwide, impacting a large portion of the target audience. By supporting MomConnect, the government is taking proactive steps to prevent maternal and infant mortality and work towards global goals. Donors can leverage the lessons learned, technology infrastructure and systems from MomConnect to implement similar programs in other countries where they fund programs. This represents valuable savings on initial setup and testing costs.

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**MOMCONNECT VALUE CHAIN**

<table>
<thead>
<tr>
<th>Gov’t/Donors/Investors</th>
<th>Knowledge Partners</th>
<th>Software/Systems Developers</th>
<th>MNOs</th>
<th>Healthcare Service Providers</th>
<th>End-users/Women Providers</th>
</tr>
</thead>
<tbody>
<tr>
<td>Provide financial and technical support for the program</td>
<td>Develop content to educate end-users</td>
<td>Build the technology infrastructure to deliver MomConnect services</td>
<td>Provide data usage across mobile networks at discounted rates</td>
<td>Register users, deliver care, implement changes based on user feedback</td>
<td>Receive valuable health information, provide feedback to improve healthcare facilities for other users</td>
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</tbody>
</table>
Since the launch of MomConnect in August 2014, the program is thriving with over 700,000 unique users registered as of November 2015, achieving an extraordinary adoption rate of over 50% of pregnant women and mothers and a reach that encompasses more than 95% of the country’s clinics.

**FAR REACHING IMPACT AND RESULTS**

Since the launch of MomConnect in August 2014, the program is thriving with over 700,000 unique users registered (as of November 2015), achieving an extraordinary adoption rate of over 50% of pregnant women and mothers and a reach that encompasses more than 95% of the country’s clinics. Based on initial data, the number of users who drop out of the system also remains low at four percent.²⁷ “You can’t even find aspirin and electricity in 95% of the clinics, so the reach is very impressive,” said Peter Benjamin, Managing Partner of Health Enabled.²⁸ Given this early success, the program is on track to reach its goal of one million registrants within two years. By November 2015, MomConnect had trained more than 34,000 healthcare workers.²⁹

Nearly 20 million messages have been sent across 6 languages. Moreover, the helpline has received more than 3,000 messages, of which compliments outnumber complaints in a ratio of six to one.³⁰ The criticism submitted to the helpline ranged from stock-outs to cases of patient mistreatment. The NDoH is acting on this feedback to improve the quality of care. The feedback received is a vital and exciting component of the system. When speaking about the feedback mechanism, Minister Motsoaledi remarked, “The women now have more power.”³¹

A recent demographic study has shown that MomConnect is reaching its intended target audience of low-income women who are most vulnerable to health risks and may not have access to information. From a sample of over 10,000 SMS users, 44% are from households earning less than US$125/month.³²

An indirect, but important result of MomConnect’s efforts is its implementation of the OpenHIM software in South Africa. This software allows different health information systems to exchange information. The use of the OpenHIM platform illustrates the catalytic role that the MomConnect program has played in South Africa.

While these outputs from the MomConnect program are promising, the direct impact on maternal and infant mortality is difficult to measure. This challenge is not unique to the MomConnect program; other maternal and infant health programs face similar issues of measuring health impact. In the long-term, MomConnect and its partners will need to measure impact in order to show that their efforts are decreasing maternal and infant mortality rates in South Africa. These efforts are underway, with the NDoH and MomConnect partners, Universities of Western Cape and Stellenbosch, operationalizing an extensive monitoring and evaluation plan. The NDoH holds monthly meetings to share findings on operational research results, discuss present activities and the program’s future.³³

**AN INVESTMENT IN TIME, MONEY AND LEADERSHIP**

MomConnect’s initial success is not only defined by its impact on maternal and infant health, but also in the program’s model and ability to demonstrate its reach and scale on a national level. Its success is due to lessons learned from the organizations that have piloted similar programs years before the MomConnect launch, government and donor commitment to funding public health programs for maternal and infant health, and leadership from the highest government levels.

- **Time and Experience:** Numerous organizations have worked for more than ten years to develop the programs that led to MomConnect. When evaluating the potential impact of a program such as MomConnect and considering if the impact justifies the costs, it is important to recognize that there are significant setup and startup costs in terms of financial investment and time devoted to learning, pilot programming, testing and refining the product or service. Without the efforts of numerous partners, MomConnect would not have been able to scale as quickly. Additionally, other organizations that leveraged digital health to reduce maternal and infant mortality learned significant lessons in how to build lasting partnerships with the government, scale-up, engage with stakeholders such as donors and other NGOs and measure impact. They also brought experience in training users to integrate the mobile tools across all levels of the health system.
MomConnect was able to leverage years of lessons from previous digital health pilots in South Africa. If it had not done so, the up-front investment needed to set up and build the program would have been much higher.

- **Money and Donor Funds:** MomConnect was able to obtain funding from numerous sources. PEPFAR, the largest donor of MomConnect, provided US$4.9 million directly through the Office of the U.S. Global AIDS Coordinator (OGAC) as a special project of the U.S. Ambassador to South Africa. The majority of program costs are spent on SMS and USSD data. Even with discounted rates from the telecom operators, nearly 70% of the PEPFAR budget is earmarked for SMS and USSD costs. The remaining 30% of the budget is overhead and distributed across supporting government human resources, technical assistance to the government, monitoring and evaluation, operational research, and stakeholder events.

- **Government Leadership:** Strong leadership from the NDoH was critical to MomConnect’s success. Minister Motsoaledi launched MomConnect with a very clear goal in mind: to connect with all the pregnant women in South Africa using mobile phones in three to six months. The clearly articulated goal provided focused leadership and direction to a coalition of partners. Dr. Motsoaledi continued to support the coalition’s efforts through the launch, from leading a roadshow across the country to advocate for the adoption of MomConnect at the provincial level, to continually showcasing the program’s achievements during national addresses to drive further adoption. This unified approach is in contrast to other countries where it may be the case that a pool of innovators are struggling to get the government’s attention or where there is no initiative or funding available for disparate programs to collaborate with each other.
**HOW THE MOMCONNECT FUNDING MODEL CAN BE SUSTAINABLE**

Currently, with the South African NDoH, several multilateral organizations and NGO partners fund MomConnect. At this time, the program’s business model does not generate its own revenue. An essential feature that allows MomConnect to scale and maximize impact is that the service is free of charge for pregnant women and mothers. Imposing a fee per message or some kind of registration costs for the end-users or the hospitals would likely reduce adoption rates. In turn, a low adoption rate would prevent MomConnect from achieving its goal of providing vital health information to the most vulnerable.

Three elements of the program’s funding model are significant in lowering failure risk and thus contributing to the sustainability of MomConnect:

1. The initial capital has been committed and donor funding will support the program until September 2016. With another year remaining, MomConnect has been given runway to prove its value proposition.

2. The funding sources are diverse and include governments and NGOs as well as contributions from private sector partners such as mobile network operators (MNOs) who may provide free or discounted data services, or smaller partners who play a complementary role such as providing content development knowledge.

3. The implementers and donors share a common mission of lowering maternal and infant mortality rates. The NDoH also brings strong political will to execute the program.

Despite these strengths, there are some risks to the model:

- **Political Risk**: A critical element of MomConnect’s success can be attributed to the political will stemming from the highest levels of the government. The NDoH serves as a key actor and driver of the program. Its authority has helped execute the program from the bottom up through local clinics and lent credibility to the program. Without its support, it would fall on another organization to assume leadership and execute the strategy. Without centralized leadership, a disparate group of operating bodies may duplicate work and resources, focus only on specialized objectives and fail to achieve the overarching mission.

- **Funding Risk**: MomConnect is an ongoing program and aims to reach approximately one million women per year. The loss of a major donor could potentially reduce the program’s capacity.

- **Costs Risk**: The costs of SMS and data usage could increase, which would change the financial model and require a higher budget in order to operate the program.

One way MomConnect could mitigate these risks is to find additional sources of funding or revenue. For example, MomConnect is currently exploring the possibility of using a portion of the tax levied on MNOs to fund the program. Adding in a recurring revenue stream would help to build a truly sustainable business model. The MomConnect team will continue to explore funding options to be able to keep the service free for end-users.

**LOOKING TO THE FUTURE: IMPROVEMENTS TO THE MOMCONNECT PROGRAM**

Approximately 1.17 million births are recorded each year in South Africa. MomConnect aims to reach all pregnant women in South Africa and to register one million users within two years of adoption. Achieving this goal will provide market validation and demonstrate a demand for MomConnect’s service. The South African government is committed to ensuring that the program continues beyond the original two year donor funding.

MomConnect has managed to reach a large national audience because it set out to scale-up first. “We attacked scale, instead of doing another pilot looking at impact. Scale is a big problem in the digital health
space, and we tackled it right away,” said Debbie Rogers of Praekelt Foundation, when asked about the public health outcomes gap in MomConnect.

The following are steps that MomConnect will take in the short-term to make improvements to the platform, expand the content and its audience in order to reach a larger number of people and make a greater impact on healthcare delivery.

- **Increase languages:** MomConnect was originally offered in six languages (English, Afrikaans, Zulu, Xhosa, Sotho and Setswana) and since October 2015 has been expanded to all 11 official languages in South Africa. Expanding the number of languages will help to ensure that no one is excluded from the program.

- **Lower registration time:** Recent operational research led by ICF International’s Strategic Information for South Africa program found that the MomConnect registration process takes upwards of 9-10 minutes, largely due to the nature of USSD. Consequently, MomConnect is exploring new ways to facilitate the registration process, including leveraging computers and Internet connectivity being introduced into health facilities as part of the National Health Insurance program. A lower registration time means that clinics can register a larger number of people.

- **Expand content:** The SMS content is being expanded to include HIV-related messages and other high-risk health issues during pregnancy such as gestational diabetes, anemia and hypertension and is being extended up to a child’s fifth birthday. Educating users on these health issues will lead to a greater health impact.
• **Expand target audience:** Further, the SMS messages are being adapted and developed to also target men, fathers, and grandmothers, all of whom are influential in women’s health-seeking behavior. The SMS messages will also go to clinical staff, to ensure they are equally informed on the health information being received by patients.

• **Add mobile channels:** Two mobile websites are being added to MomConnect to offer more interactive and visually rich health information. The first, called B-Wise, targets adolescents with safe sex messaging. The second is MAMA SA’s mobile website, Askmama.mobi, which will be rebranded under the NDoH.

• **Integrate with national health insurance system:** MomConnect’s data is shared with and can integrate with current Patient Information Systems running in the National Health Insurance pilot districts. MomConnect will continue to explore these linkages.

In the long-term, partners believe there is an opportunity to directly integrate service delivery and enable remote access to medical experts and emergency care and transportation. By building on the MomConnect platform, the NDoH will adequately be able to address the “Three Delays Model.” Coined in 1994, the model highlights the barriers women face in receiving timely and effective medical care to prevent deaths during pregnancy and childbirth: the delay in decision to seek care, the delay in reaching care and the delay in receiving adequate care. By addressing these three delays, South Africa has a good shot at reducing its maternal mortality rate and protecting the lives of women in the country.

### CHALLENGES TO SCALING UP

MomConnect is already beginning to tackle some of the challenges to increasing its reach, such as expanding languages and content. Other challenges to scaling include:

• **Raising awareness:** The launch of MomConnect was supported by television and radio advertisements to drive uptake. National awareness campaigns through mass media advertising can require significant financial resources.

• **Increasing adoption rates:** The NDoH relies on clinics to register users. It monitors the NPR and contacts clinics that are not submitting data to troubleshoot challenges or concerns. Adoption rates have varied by region and some regions took longer to get on board with the program and register users. For example, clinics in the Western Cape had few registrations in the first five months, but then gained momentum.

• **Funding high costs of mobile phone data fees:** The NDoH is pursuing multiple strategies to reduce the SMS costs and identify sustainable funding sources. There are plans to collaborate with the Department of Telecommunications and Postal Services to renegotiate SMS rates with the telecom operators. In parallel, the NDoH is considering partnering with industry organizations like the Universal Service and Access Agency of South Africa (USAASA) to bargain with telecom operators for waived fees, or utilize the tax levy placed on telecom operators to fund the program.

• **Adapting to technology changes:** To circumvent the high SMS costs, the NDoH and technical partners are keen to begin exploring mobile data solutions through mobile app platforms. The benefits include: significantly reduced costs, improved speed and efficiency, unrestricted content constraints in comparison to SMS and the ability to experiment with platforms such as WhatsApp and Facebook Messenger. “In 3-5 years there is going to be a dramatic shift in the types of phones that people are using. If you can get people to use data, then MNOs will be willing to offer zero-rated URLs, because it will sell data as a whole,” said Debbie Rogers of Praekelt Foundation. “We are currently exploring the feasibility of shifting from SMS to data,” said Amy Gottlieb of the United States Agency for International Development (USAID). “It will have to be a combination, but there will be a gradual shift from SMS to data,” she added.

### KEY LESSONS ALONG THE PATH TO SCALE

• Political will and government stewardship provide credibility

• Integrating with the public health system allows the program to leverage its resources and feed data back into the system

• Free service for end users is essential to adoption; any costs regardless of how small may turn users away

• Past or existing pilot projects are a rich source of expertise and systems to build upon
BEYOND MOMCONNECT

MomConnect has already made a significant impact in South Africa. The program has leveraged the collective power, resources and knowledge of the government and its partners to tackle the challenge of reducing preventable maternal and infant mortality at scale. It accomplished this by selecting scalable technology, reaching its target audience at an early stage, developing engaging content, and collecting feedback to improve healthcare services.

MomConnect continues to add users and improve its services. Partners are building value-added services on top of MomConnect, including the expansion of content for pregnant women, and the extension of content to additional target users.

MomConnect has served as an entry point from which the NDoH can build a more comprehensive HIS, wherein laboratories, nurses, doctors, and patients are all linked together. Investments made through MomConnect, including implementation of the OpenHIM platform, have helped advance South Africa’s HIS and generated momentum for additional digital health services and policies. MomConnect’s reach in South Africa makes it an ideal platform to launch an extensive suite of health-related services that would improve the South African healthcare system beyond maternal and infant health.

“MomConnect has served as a catalyst to hone in on mHealth in South Africa (as there are already numerous on-going mHealth initiatives); and due to its scale, MomConnect has put South Africa in the global limelight as [one of] the first mHealth initiatives to roll-out nationally.”

- Amy Gottlieb, USAID
1 Oxford Business Group. The Report: South Africa
4 Benjamin, Peter. “Follow Up Interview with Peter Benjamin.” E-mail interview. 3 Nov. 2015.
10 According to the World Health Organization, South Africa’s Maternal Mortality Ratio is 140 deaths per 100,000 live births in 2013, the most up-to-date data available.


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