SMS Maama

SMS Maama provides pregnant women with information via SMS and connects these women to trusted midwives, advocating for respectful maternity care.

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SMS Maama is a multinational award-winning social business venture.
EXECUTIVE SUMMARY

Uganda has the third highest birth rate in the world. With a maternal mortality rate of 360 deaths per 100,000 live births (The World Factbook, 2015), many cases may be preventable with medications, early health assessments, and improvement of nutrition. However, many women in Uganda may not be able to access this information. They must pay for visits with nurse midwives, travel a long distance to the health clinic, and do not have reliable access to the Internet.

The White Ribbon Alliance’s Respectful Maternity Care Charter maintains that “Every woman has the right to information.” SMS Maama (“Mom” in Luganda, Uganda’s language) will help to fulfill the right to health information about pregnancy and birth at no cost to the woman. SMS Maama uses cloud technology to provide easy-to-read health information and interactive health screening text messages to women with mobile phones in rural Uganda. By working alongside local nurse-midwives, SMS Maama provides information and monetary incentives to pregnant women, encouraging and empowering them to take an active role to know the signs and symptoms of some pregnancy complications.

Participants receive a weekly information text message and advertisement message for local Ugandan businesses. Informative messages include general nutrition reminders, weekly gestational information, and information about birth. Weekly advertisement messages provide revenue to fund SMS Maama’s expenses and ensure sustainability.
Screening questions are received on a bi-weekly basis and identify at-risk women to nurse-midwives for follow-up and also let women know they should make time to visit the clinic. Each time a woman responds to one of these questions she receives 1000 UGX (~$0.33 USD) to her mobile money account. This incentive encourages active participation and helps to pay for any family or pregnancy-related needs. Throughout the course of a woman’s involvement in SMS Maama, she has the opportunity to accumulate money to subsidize a package of delivery supplies that every woman is required to provide herself.

SMS Maama will provide culturally sensitive, personal, accurate, and up-to-date information directly to the hands of pregnant women.

**PROBLEM STATEMENT**

**Mothers in Uganda face a high risk of maternal mortality.**

The rate of maternal deaths per 100,000 women in Uganda in 2013 was 360, whereas the United States and United Kingdom had 28 and 8, respectively (UNICEF Maternal Mortality Ratio, 2013). According to UNICEF (United Nations International Children’s Emergency Fund), “almost all” of these deaths can be prevented, as evidenced by the huge disparities in the maternal mortality ratio among richest and poorest countries, see Figure 1 (UNICEF, 2015).

According to the 2008 Uganda Demographic Health Survey, Ugandan women’s death in labor and delivery are attributed to 26% postpartum hemorrhage, 13% obstructed labor, 8% unsafe abortion, and 6% hypertensive disorders of pregnancy (Bwesigye, 2013). Some of these cases are preventable with medications, assessments, or nutrition. While the gold-standard for providing the safest care possible – medications, cesarean birth, and highly skilled assessments – are not available to all women in Uganda, there are some things that women can do to improve their health.

For example, the likelihood of postpartum hemorrhage may decrease by increasing iron in the women’s prenatal diet. Assessment of the baby’s position in the last few weeks of pregnancy to look for potential obstructed labor may help the woman determine whether it is safe to deliver at home or if she should make arrangements to deliver at the health center (Lowdermilk, 2012). High blood pressure in pregnancy can lead to seizures, coma, or death, but early delivery can prevent these complications. Severe high blood pressure might be detectable with symptoms questionnaires, so the woman can determine if she should induce early labor or have a cesarean birth (Mammaro, et al. 2009). Providing this information to mothers empowers them to make informed decisions when planning their deliveries.
Unfortunately, going to a health center does not guarantee that providers can save their lives. Uganda’s healthcare system is ranked 164th out of 187 countries ranked (United Nations, 2013). With a shortage of trained professionals, lack of access to appropriate medications, and a lack of hospital beds, morbidity and mortality rates remain high. Although improving the Ugandan health care system is beyond the scope of SMS Maama, we will work to empower women in rural areas, where only 36% of women deliver in a healthcare facility (WHO, 2011). By arming women with information, these women may be able to recognize complications before they become fatal, and they will be better equipped to plan ahead for riskier deliveries.

**SCOPE/CUSTOMER SEGMENTS**

Customers for SMS Maama are stratified by income and geography. Kampala, the capital city of Uganda, has more health care resources available than its surrounding rural villages. In the latest Ugandan Bureau of Statistics publication from 2012/2013, the average monthly income of an urban Ugandan family was 772,000 UGX (equivalent to $224 USD) compared to 325,000 UGX ($95 USD) for a rural family. Urban families earn over two times the amount of rural families (Uganda Bureau of Statistics, 2013).

Women in rural Uganda have less access to medical care than their urban neighbors both because they may not have the money for care in private health centers closer to home, and because they may lack access to reliable transportation to reach health centers. However, most people in Uganda either have a mobile phone or have access to one. The sophistication of these phones lies somewhere between simple flip phones and smartphones, and many people use them to access Facebook and Twitter. Mobile plans in Uganda are not subscription-based, as they are in the US with Verizon or AT&T, for example. Customers use a pay-as-you-go model, buying airtime with phone cards. The mobile network market in Uganda is an oligopoly, with a handful of major players. With phones that have slots for more than one SIM card, many Ugandans have numbers with multiple carriers, buying airtime from each (Maestas, 2013).

In theory, the health care system in Uganda provides free medical care to all citizens. As a part of this care, pregnant women are entitled to four prenatal visits, known as antenatal visits locally. Ninety-four percent of women receive care from a skilled antenatal care provider; 47% complete all four visits; and only 17% of women attend their first visit during their first trimester of pregnancy (Bwesigye, 2013). SMS Maama hopes to increase the utilization of antenatal care through its increased contact between nurse-midwives and patients through text messaging.

An extremely popular method of money exchange is through mobile phones, known as Mobile Money Transfer. People have bank accounts set up through their mobile carrier, and can receive money from employers or pay for items and services via the mobile network.
PROPOSED SOLUTION

SMS Maama will utilize cloud technology through Twilio, an SMS Gateway system with API capabilities for sending programmed Short Message System (SMS) messages. Twilio will send pre-programmed weekly pregnancy-related informational messages and bi-weekly interactive yes/no symptomatic questions to enrollees. These informational texts and questions will be relevant to a mother’s estimated gestational age and will serve to provide information to women about pregnancy, birth, and the postpartum period. Weekly advertisement texts providing information from local businesses will be tailored to our defined demographic. Businesses will pay to access our unique customer base, providing revenue.

The pregnancy-related informational messages are constructed and developed through a partnership with Mobile Alliance for Maternal Action (MAMA). MAMA, an established health promotion messaging program started in 2011 by former U.S. Secretary of State Hillary Clinton, aims to improve maternal health by providing text messages to vulnerable mothers around the world. MAMA funding comes from the United States Agency for International Development (USAID), Johnson & Johnson, the mHealth Alliance, the United Nations Foundation, and BabyCenter. MAMA began with a $10 million investment, developing the platform and messages for Bangladesh, South Africa, and India. In addition to the first three pilot programs, MAMA expanded their services to allow other organizations to access and utilize the platform for other needy populations. They provide support and allow for cultural and language customization at no charge to the local partner organizations. Local partner organizations are currently running worldwide (Figure 2). SMS Maama has used MAMA’s established health promotion text messages as a framework for informative texts. SMS Maama will customize MAMA’s messages through continued meetings with our local nurse-midwives and obstetricians partners.

Midwives are an important component to SMS Maama and they will be paid a stipend to participate in SMS Maama. They will be provided with a mobile phone. When women respond that they are experiencing a symptom that might require medical advice, midwives will be alerted to the case through Twilio programming. These midwives will be responsible for initiating further communication with the woman based on their independent nursing judgment. She may implement nursing care through SMS, or may encourage the woman to visit the clinic for assessment and/or intervention. Midwives are required to respond to symptomatic texts within 6-8 hours of receipt.

SOCIAL AND FINANCIAL VALUE PROPOSITIONS

The social value of SMS Maama is to fulfill every woman’s right to accurate pregnancy information. SMS Maama hopes to increase maternal health visits by increasing communication with midwives. The ultimate value is increased maternal health.
Financial value to customers will be provided to participants who interact with the yes and no questions via monetary incentives to their mobile bank accounts. Depending on a woman’s engagement with the weekly questions, she will be able to subsidize a varying portion of a birthing supplies bundle (24,000 UGX or approximately $7.00 US). This bundle (a MAAMA kit) includes sterile razors, blankets, antiseptic, and gloves. Without providing these materials, a mother would be denied delivery services at the health center.

Further financial value is added when considering the stipend that program midwives will earn. For the pilot phase, midwives will each earn $80.00 (275,000 UGX) each month of the pilot.

**THEORY OF CHANGE**

SMS Maama’s Theory of Change visual model can be found below in Figure 3. This model is inclusive of SMS Maama’s mission and value propositions. Figure 4 represents the SMS Maama process.

**INPUTS**
- Information via SMS
- Screening via SMS
- Incentives
- Midwife stipends

**OUTPUTS**
- Participants read and incorporate information
- Participants interact with yes/no questions and receive follow-up
- Participants and midwives are able to spend incentives

**OUTCOMES**
- Increased health visits
- Increased satisfaction/respectful maternity care.
- Increased education
- Improved healthcare communication
- Purchase of Maama kit or other goods

**IMPACT**
- Increased maternal health and satisfaction with healthcare provider

**ALTERNATIVE SOLUTIONS**

Without the service provided by SMS Maama, it is more difficult for women to get information about pregnancy. Women may be required to pay for visits to the health center or travel long distances to receive care, causing them to get most pregnancy and birth information from family members, friends, or traditional birth attendants. While this alternative is not necessarily negative, she may not have the most up-to-date information regarding her care and any signs or symptoms of pregnancy and birth complications.

The SMS Maama solution is a stronger alternative because it empowers women through the use of a cost-effective educational model.
BUSINESS MODEL AND MARKET ANALYSIS

In the pilot phase, SMS Maama will rely largely on grant monies. Following pilot phase and evaluation, SMS Maama will begin to incorporate revenue activities in order to generate income. Our on-going costs are primarily comprised of fees for sending SMS messages via Twilio, providing incentives to interactive response questions, and providing stipends and mobile phones to project midwives. Our revenue streams will rely on SMS advertising and part of our pilot phase will be comprised of exploring and delineating permanent revenue streams such as the use of donation apps, change round-up programs, individual sponsorships, and donation bundles in mobile phone packages. During this time, SMS Maama will also assess items in the pilot that may not be sustainable on a long-term basis.

Local business partnerships are extremely important as they are what will help sustain SMS Maama. These businesses will range from local stores, vitamin or nutritional goods, and other pregnancy or child care related businesses. With a designated cohort of pregnant women, SMS Maama offers a unique niche population to these companies. As such, SMS Maama will expect to receive ~100 UGX ($0.029 USD) per each weekly SMS sent to active participants. This revenue will rise as the network of women enrolled grows. Finally, SMS text advertising has proven highly effective. Text advertising is unique in that it provides a direct one-on-one dialogue with the customer. With approximately 90% of all text messages being read within three minutes upon receiving them, text message advertising is two times more effective than online advertisements and, therefore, appealing to the advertiser (Swallow, 2010).

SMS is an extremely cost-effective way of sharing information and requires little monetary investment long-term. For instance, one SMS message sent through Twilio is equivalent to $0.03 USD. Twilio requires a one-time set-up fee in order to purchase a phone number. Likewise, the cost of one incentive paid to one woman is equivalent to $0.33 USD.

Mobile phones are widely used throughout Uganda. From 2002-2014, mobile use in Uganda climbed from ten percent to 65%. Mobile phones are used for a variety of activities; however, within Africa the highest cited use is for SMS text messaging (See Figure 5) (Pew Research Center, 2015). SMS Maama is harnessing the use of this ubiquitous technology in order to share relevant information to a specific population.

More specifically, SMS Maama’s pilot site, Benedict Health Centre sees approximately 30 new pregnant women each month. Clinic patients have varying socioeconomic status and educational backgrounds; however, patients nearly always own a mobile phone. According to our contacts at the clinic, women have numerous questions but are unsure of where to get reliable information.

Coupled with the cost of clinic visits, SMS Maama’s information platform and connection to midwives is a beginning place to provide reliable information at no cost to the patient via a device that is largely used. When informally presented with the idea of receiving information via SMS, many Benedict Health Centre obstetric patients have responded enthusiastically.

"My friend told me to stop drinking water to have an easy labor."
-Benedict Health Centre obstetrics patient discussing questions with midwife

"I want to sign up right away!"
-Benedict Health Centre obstetrics patient upon hearing about SMS Maama program
Participants and Layout

Our pilot will be out of Benedict Health Centre in Luzira, a suburb of Kampala. The head of obstetrics, Dr. Elizabeth Nakabuye, OB-GYN, is an enthusiastic local partner. She will be joined by four of the clinic’s midwives who have agreed to take part in the project. These local staff will identify participants. An initial cohort will be capped at 60 women, 30 of which will receive both texts and incentives and 30 of which will receive only incentives. Each participant will also receive a Maama kit to assist with the labor and delivery process. SMS Maama hopes to initiate the pilot in June or July 2016 and have it conclude in April 2017. Women will enroll and complete project paperwork with local clinic staff and they will then begin to receive informational texts on a weekly basis and interactive texts on a bi-weekly basis. Any follow-up that is indicated through the interactive feature will be performed by one of the four clinic midwives (each assigned 15 pilot enrollees). Women will continue to receive SMS information/questions through three weeks postpartum.

SMS Maama is requesting $15,500.00 for pilot implementation. This amount is inclusive of incentives, Twilio fees, midwife stipends and phones, team international and domestic travel, team mobile phones, data plans for team and midwives, office supplies, translation and back translation of pilot forms, and research clearance fees.

Measurement

Data collected for monitoring and evaluation purposes will be deidentified. It will be gathered through the clinic’s data, the data from Twilio, and patient surveys. From clinic data we will analyze gestational age upon time of enrollment, age of the women, number of antenatal visits attended, and health status. Data regarding level of maternal health information and healthcare satisfaction will be gathered through surveys administered before and after participation. SMS Maama will also administer surveys to participating midwives to determine their satisfaction.

Assumptions

Our pilot will test the following assumptions:

- Women will want to enroll and will find the monetary incentive appealing.
- Mobile phone service will be continuous and reliable so that women can actively participate.
- Program midwives will follow-up within the required 6-8 hour period with an assigned participant when that participant has answered yes to a screening question.
- Women receiving further health information after answering yes to a screening question will follow through on any nursing instructions.
- The information provided by the program will increase maternal health knowledge and satisfaction of healthcare relationship.

Appropriate measures will be taken to alter the design and strategy should any one of these assumptions be proven false.
EVIDENCE-BASED SUPPORT

Research shows that mobile healthcare interventions are effective in engaging participants in their own healthcare. For example, RapidSMS launched in 2009 in Rwanda (introduced by UNICEF to the Rwandan Ministry of Health) to connect health workers with pregnant women via mobile phone. Community health workers use RapidSMS to track registered mothers throughout the duration of their pregnancy. The tracking capabilities of this program have increased follow-up by healthcare providers and increased the overall amount of antenatal visits. The program has been credited with having an essential impact on reducing the number of maternal deaths to zero in two Rwandan districts in 2011 to ten districts in 2013. All 30 of Rwanda’s districts now use RapidSMS and the application has expanded to provide content through a child’s first one thousand days of life (UNICEF, 2013).

An East Timor program, Mobile Mom, focuses primarily on the connection between a mother and midwife. At a woman’s first prenatal visit, midwives enroll the woman and she begins to receive informational related text messages twice weekly. More specifically, the service stresses the importance of having a doctor or midwife present for delivery. In Manufahi municipality, where the initiative was started, clinic deliveries rose by 70 percent and total births assisted by a skilled attendant, whether at home or in a facility, rose by 32 percent (Reece, 2015).

Furthermore, in a randomized control study in Zanzibar, women in the intervention group were given a mobile phone credit voucher allowing them to communicate with their health provider as needed and were provided with appointment reminders and other related pregnancy information. Women in the control group received care as usual. Women in the intervention group were more likely to have attended four or more antenatal visits versus those in the control group: 44% versus 31% (Lund, et al. 2012).

MAMA Mobile’s results from its partner in Bangladesh are promising. In 2014, approximately 78% percent of participating women reported attending four or more antenatal visits versus 32% nationally (see Figure 6). Of these enrollees, 100% recommended the service to others and approximately 90% believed that the messages met their needs both during and after pregnancy (MAMA, 2014).

Incentivized programs have been shown to positively engage program enrollees. For example, in a cohort study in Uganda, two groups of employees at two different companies were given health education quizzes via SMS. Some of the quizzes contained incentive options; the quizzes with the incentive option illustrated a greater immediate response rate, versus those questions that did not contain an incentive option (Lepper, et al. 2013).

![Figure 6: MAMA Mobile Bangladesh program data 2011 to 2014 program enrollees versus national population](image-url)
FIVE-YEAR PLAN

Relationship Building

During the pilot, we plan to build partnerships with local businesses to create sources of revenue for future implementation. Initial efforts to connect with local businesses will focus on local business clubs, social media networking, and face-to-face meetings. We expect that advertising directly to pregnant women who are eager to care for their new children is an attractive customer base for many local businesses—we will draw upon this angle in meetings with local businesses.

Expansion

In the five years following the pilot program we will expand the program to our intended rural customers. Based on enthusiasm from health practitioners in Uganda, we expect that their endorsement of SMS Maama to their patients, along with posters and other printed materials, will gain many more customers. SMS Maama visits to rural communities with midwives from the closest health centre will create important introductions into new communities.

SMS Maama also hopes to expand SMS content to include information for mother’s with children through three years of age in order to provide education for these formative years. We will continue to monitor and evaluate our content, expenses and revenue, and women’s levels of maternal education and overall satisfaction.

Eventually, partnerships with local businesses and culturally appropriate advertisements will be sufficient and SMS Maama will be a sustainable business venture.


**APPENDIX 1: SMS MAAMA TEAM**

**Sonja Ausen-Anifrani** is pursuing a Master’s of Public Health, Maternal and Child Health and has an MA in International Studies. She is currently the Associate Director at Wisdom Ways Center for Spirituality. She has a significant background in both local and national refugee resettlement work and international experience in the region of East Africa. She also has significant experience managing, reviewing, and writing grants and hopes to use her degree in the areas of global and maternal health.

**Meg KenKnight Burman** is a Nursing student graduating in May of 2016. She plans to become a public health nurse working in maternal-child health. Prior to attending the University of Minnesota she graduated from Luther College, was a Saint Joseph Worker through the Sisters of Saint Joseph of Carondelet in Minneapolis, served with AmeriCorps VISTA at Catholic Charities Migration and Refugee services, and went on to manage a large Minneapolis food shelf. She has international experience in the Mediterranean with refugees from Africa.

**Katelyn Pastick** graduated from the University of Minnesota in 2015 with a B.S. in Genetics, Cell Biology, and Development and minors in Spanish and Public Health. Interested in international health, Katelyn has experience working with Minnesota refugee and immigrant populations, as well as international experience in Mexico, Kenya, and Uganda. Katelyn is currently working at Mulago Hospital in Uganda, assisting with HIV-related cryptococcal meningitis research. She will apply to medical schools next June.

**Nicole Stephens** currently resides in Kampala, Uganda and is a Doris Duke Fellow. She is interested in pursuing a medical degree in Obstetrics and Gynecology.

**Benedict Health Centre Team Members**

Dr. Elizabeth Nakabuye, OB-GYN
Program Midwives: Siccilly, Betty, Namyalo, and Proscovia

**Acknowledgments**

SMS Maama would like to thank our teachers and mentors, Fred Rose and Cheryl Robertson for their feedback and encouragement!
## SMS Maama Pilot Line Item Budget

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### SMS Maama Pilot Current Revenue

$0.029 per advertisement x number of weeks in program x number of enrolled

### SMS Maama Future Revenue Stream Formula

\[
\text{Total Revenue} = 0.029 \times \text{Number of Advertisements} \times \text{Number of Weeks} \times \text{Number of Enrolled Students}
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### Identified Expense Amount

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| TOTAL REQUESTED EXPENSES    | $15,465.80 |

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### Catalog of SMS Maama Line Item Budget

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### SMS Maama Pilot Expense Calculations following line-item budget

From left to right: SMS Maama Pilot Expense Calculations following line-item budget.
APPENDIX 3: REFERENCES


Maestas, A. (2013, September 10). Everyone (well, almost) has a cellphone or three in Uganda. Retrieved April 1, 2015, from http://durangoherald.com/article/20130910/BLOG06/130919999/Everyone-(well-almost)-has-a-cellphone-or-three-in-Uganda-


Photos and Figures

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Page 4 Woman with mobile phone: mtrac.ug
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