Mama Rescue: An eVoucher and Emergency Dispatch System for Ugandan Mothers
Uganda suffers from a maternal mortality ratio of 336 deaths per 100,000 live births (2016), and it is thought that 75% of these deaths can be attributed to one of three types of delay, two of which are often related to transportation. Mama Rescue is a simple automated mobile-phone platform that provides dispatch for emergency perinatal transportation in rural areas, and transport vouchers enabling women to be transported to deliver in health centers, received after attending four antenatal care appointments. By coordinating transport from home to health center, logistics, and communication between facilities, Mama Rescue aims to reduce delays associated with childbirth, thereby mitigating risks related to maternal and newborn mortality and morbidity, and increasing mothers’ and midwives’ confidence in the health system.

**Challenge**

The 2016 Demographic and Health Survey of Uganda found that 73.4% of women who had a live birth during the five years preceding the survey gave birth in a health facility, and 59.9% attended at least four antenatal-care visits. The overall maternal mortality ratio is 336 per 100,000 live births, representing a 1.9% lifetime risk of maternal death. In the Mountain Region (which includes Kasese), just 65.4% of women delivered in a health center, and 54.5% attended ANC at least four times. Difficult mountainous terrain, lack of public transportation, a shortage of doctors and nurses, and many cultural factors mean that Kasese is highly affected by all three delays related to maternal mortality and morbidity. Women often decide to deliver at home, may be unable to find transport to hospitals and health centers for delivery, or may face long wait times and underequipped facilities when they do manage to reach care. In Uganda, basic mobile services are increasing at an exponential rate, with mobile phone ownership at 65%.

**Opportunity**

Mama Rescue offers tools for reducing all three of these delays, through an antenatal care (ANC) tracking and transport voucher system for women in early labor, as well as an emergency transport dispatch system. Using the system depends on the mother having access to a simple mobile phone to contact a motorcycle rider on the day of delivery, but it does not need to be her own phone, and is not required for her to receive emergency transport. Cell-phone ownership has reached extensive penetration throughout East Africa, and it is estimated that 77% of Ugandan men and 54% of Ugandan women own a mobile phone. While the rate of ownership is lower in rural than in urban areas, it is still extensive enough that many women who do not own phones are able to borrow them when necessary, from their husbands, family members, neighbors, or friends.

**Seeking Care**

The first delay is the decision to seek care, impacted by a mother’s perception of her own risk, cultural and familial perspectives on healthcare and childbirth, and anticipated difficulty or cost of reaching care. A prolonged labor at home alone or with an untrained birth attendant could mean that preventable or treatable complications, like hemorrhage, birth asphyxia, or malpresentation, become fatal.

**Reaching Care**

The second delay is related primarily to the ease with which a woman can reach a clinic or hospital. Road conditions, cost or existence of public or private transport, and condition of the mother all impact her ability to access care. Women in labor may have to walk long distances to reach a clinic, or be unable to afford the fare for transportation.

**Receiving Quality Care**

The third delay relates to receiving quality services at the facility. Mothers commonly reach a clinic or hospital that is understaffed or unable to provide her with specialized obstetric services. This may result in being referred to a different facility, or long wait times during which the condition of mother and/or baby may worsen.

During her four ANC visits, a mother is advised of the benefits of going to the clinic for delivery. At her fourth visit she is given a voucher that she can use for transport to the clinic on the day of delivery, so she can leave as soon as labor begins. She is also informed that in the event of a complication, she will receive free and fast transport to the hospital.

On the day of delivery, the mother uses her transport voucher to travel by boda boda as soon as labor begins. If the mother develops a complication or the health center lacks a resource and cannot attend to her, the Mama Rescue dispatch system will identify the fastest possible vehicle to immediately take her to the next level facility that can offer care.

Health Workers at the receiving hospital are alerted that a mother is in her way by the Mama Rescue emergency system, and provided with clinical details that help hospital staff prepare necessary personnel and equipment for surgery or other emergency treatment. Physicians and anesthetists providers can be alerted immediately so that valuable time is not lost waiting for them.
The Mama Rescue Model: Partners and Roles

Stakeholder Map - August 2017

MamRescue is zero-rated by MTN and is only available to MTN subscribers

Yo! Uganda developed the Administrator interface and applications which run the voucher and dispatch services. They also operate as the aggregator

Baylor is responsible for implementation, financial management, reporting & administration of the project

Einstein Medical College is responsible for conducting Monitoring & Evaluation on the project

Peter Klatsky is the founder of this initiative, and remains closely involved

Praekelt.org has been identified as a suitable partner to assist with the scale up of this project

Research Design

A longitudinal implementation study* run in the pilot year of Mama Rescue compared attendance at ANC visits number 1 and 4, maternal deaths and fresh stillbirths, and delays experienced by mothers in labor, between three control and two intervention referral sites.

Data on these variables were collected by data collectors at baseline and throughout the pilot year, from maternity registers at the control and intervention sites, and through interviews with mothers who reported in minutes the delays they had experienced.

At the end of the pilot year, data analysis and interviews with stakeholders demonstrated massive appreciation of the service, increased clinic and hospital admissions, and a decreased trend in fresh stillbirths. The service was continued through funding extensions from the Vitol Foundation, and continues to run as of January 2018.

*Principal investigators were Dr. Peter Klatsky of Albert Einstein Medical College, and Drs. Addy Kekitiinwa, Dan Murokura, and Alice Asiimwe of Baylor Uganda and Saving Mothers Giving Life.
Results: Care Seeking, Delays, and Clinical-Outcome Variables

In addition, mothers who had been referred to hospitals for complications were asked, “How long did it take from when you began looking at the first health clinic until referral transportation arrived?” Over 1,000 interviews with mothers who experienced referral revealed dramatic decreases in the time between decision to refer and arrival of transport, before and after the intervention. Before Mama Rescue, the average wait time was about 1 hour in both intervention hospitals. After the intervention started, the average amount of time reported dropped to 25 minutes at Bwera and 14.6 minutes at Kagando.

<table>
<thead>
<tr>
<th>Outcome variables (pilot year only)</th>
<th>Result</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total emergency transports provided</td>
<td>1249</td>
</tr>
<tr>
<td>Total boda boda vouchers used</td>
<td>2,988</td>
</tr>
<tr>
<td>Average boda boda rides per day</td>
<td>9</td>
</tr>
<tr>
<td>Average emergency transfers per day</td>
<td>4</td>
</tr>
<tr>
<td>ANC attendance</td>
<td>Increased trend in ANC 1 (p&lt; 0.05)</td>
</tr>
<tr>
<td>Increased trend in ANC 4 (p&lt; 0.05)</td>
<td></td>
</tr>
<tr>
<td>Skilled birth attendance</td>
<td>Increased trend in skilled birth attendance (not statistically significant)</td>
</tr>
<tr>
<td>Fresh stillbirth</td>
<td>Decreased trend in fresh stillbirths by 33%</td>
</tr>
<tr>
<td>Maternal death</td>
<td>No significant change (rare event)</td>
</tr>
<tr>
<td>Time to arrival of transport (HCII to hospital)</td>
<td>Dramatic decrease in both referral hospitals -74.3% at Kagando and -57% at Bwera</td>
</tr>
</tbody>
</table>

Average time from decision to refer until transportation arrived (minutes)

We are now receiving mothers in a better condition... before you would receive mothers who were really exhausted... and you might lose one out of the two.

Midwife at hospital
Costs
Costs for the vouchers are currently covered by contributions from generous donors, and the average cost is $2 per boda boda transport (ranging from 5,000 to 10,000 Ugandan Shillings per ride), and $17 per emergency referral (ranging from 25,000 to 65,000 Ugandan Shillings per ride). Mothers are never responsible for any cost, in comparison to paper voucher programs in which women often pay a small fee for the voucher (usually worth less than the value of the transport) as a contribution to the program. Currently, Mama Rescue operates on a zero-rated telephone line provided by MTN. Telecom providers are often enthusiastic about providing services like this, as it is a huge contribution to a large-scale public-health program in the community.

Opportunities
Accessibility
Most mobile solutions focus on the delivery of digital services via smartphone devices, given their greater opportunities to collect and deliver richer data and multimedia. However, Mama Rescue has shown that using simple mobile tools such as USSD, IVR, and mobile money can be an effective way to manage an electronic voucher and emergency dispatch system that can reach the last mile.

Electronic Data Records
Despite some implementation challenges, Mama Rescue can increase the efficiency and accuracy of collecting electronic medical record data such as antenatal visit attendance, birth reports, and emergency referral data.

Integration with Other Digital Services
Mama Rescue’s primary touchpoints are at health facilities, where many viable points of integration with other maternal and community health initiatives reside. This integration could take place with community-level services such as a maternal messaging platform, or with frontline health-worker interventions.

Confidence in the Service
Mothers who are in labor or preparing for delivery typically will go to their birth facility with a number of birth attendants. The number of attendants can be quite high, as they will need to carry or transport the woman to a referral hospital if there is a complication with her delivery. As mothers and the community have become familiar with the Mama Rescue service, drivers have reported a decrease in the number of birth attendants accompanying women.

An eligible community should have:
- Buy-in from the local department of health and MoH
- Minimum levels of phone literacy and ownership
- Established public transport system
- Mobile money
- Implementation partner

A suitable implementation partner should have:
- Consistent presence in the community
- Respect within the community
- Experience with mHealth or voucher systems

Works Cited
Want to know more?

www.mamarescue.org