# Scaling Up a Mobile Phone Obstetric Triage and Referral System in Liberia Improves Maternal Care

Researchers in Liberia developed and tested a mobile obstetric emergency system (MORES) that reduced decision-to-delivery time in Bong County, shortening the time between the decision to perform an emergency surgical birth and delivery of the newborn. By improving communication among health workers during obstetric triage with WhatsApp, a mobile messaging service, a MORES can help prevent deaths from emergencies related to pregnancy and childbirth.

In Liberia, where the maternal mortality rate is 661 per 100,000 live births—the ninth highest in the world—a MORES presents an opportunity for national and local governments to save lives and improve obstetric outcomes after birth.

Rural health clinics can provide labor and delivery care, but many cannot perform the emergency cesarean deliveries—the surgical procedures that are sometimes necessary to save the lives of the mother and newborn. By expanding this MORES pilot to other Liberian counties and adopting, standardizing, and scaling up the model across hospitals and comprehensive health centers, the government can help reduce unnecessary maternal and newborn deaths.[1]

Obstetric triage, when properly carried out, reduces the time between when an emergency cesarean is deemed necessary and when the baby is delivered—thereby decreasing the wait time for obstetric emergencies at health facilities.
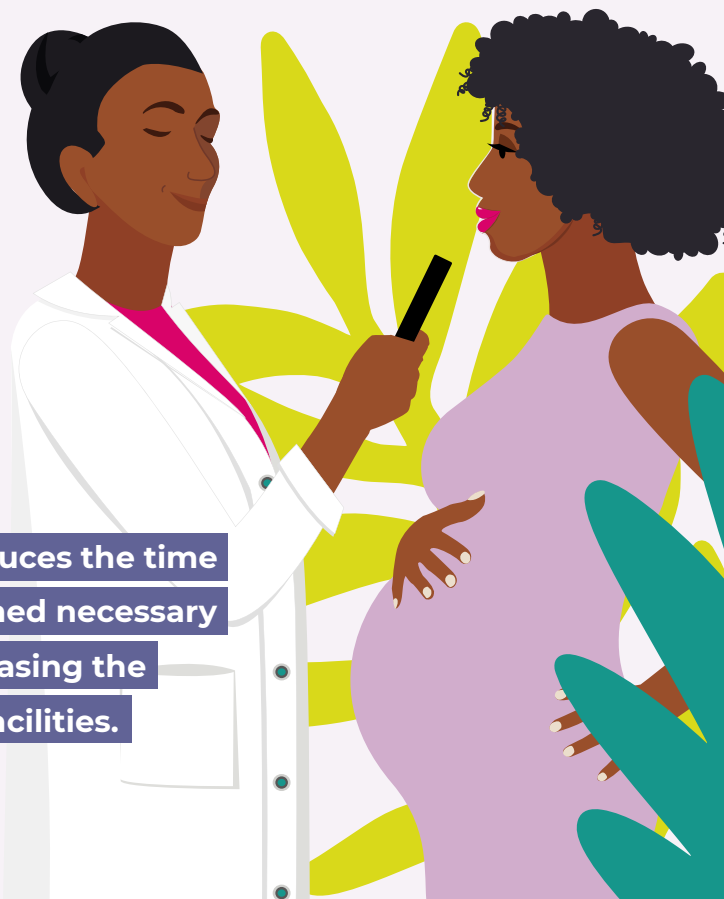
Better Communication Can Be Lifesaving

Cesareans are the most commonly performed surgical procedure among women worldwide, with the vast majority of cesareans in sub-Saharan Africa done as emergency procedures.[2] Reducing delays in determining the need for cesareans and alerting health facilities about incoming patients increases the chances of the best outcomes for mother and newborn.

In Bong County, Liberia, poor communication between rural health clinics and district hospitals delays women from receiving adequate care once they arrive at a facility and, in turn, increases preventable maternal deaths.[3] Moreover, only 40% of rural health clinics are equipped equipped to make an emergency referral—defined as having access to a functional ambulance or other vehicle and a phone—underscoring the need for improved emergency communication systems.

To address these system gaps, researchers developed a WhatsApp-based MORES that connected providers at 18 rural health clinics with obstetric providers at two hospitals in 2021–2022. When a rural clinic identified the need to refer a patient to a district hospital for an emergency cesarean, clinic providers contacted the appropriate district hospital using WhatsApp, alerted staff of the incoming patient, and thereby allowed hospital staff to prepare for the patient's arrival or divert them to another hospital.

Combined with a triage training program, this MORES has the potential to facilitate timely triage, referral, transfer, and ensure rapid and accurate patient assessment care and planning. Results from the research are promising: Decision-to-delivery time decreased from a median of 177 minutes before introduction of the MORES to 68 minutes, and the training improved triage knowledge among participating midwives and nurses, according to an assessment.

What do we mean by triage?

Triage is the process of assessing and prioritizing patients based on the urgency of their need for care to get the best outcome in the shortest possible time. It involves a concise and focused evaluation to determine how long a patient can safely wait for comprehensive medical examination and treatment.

Source: Diane J. Angelini and Donna La Fontaine, *Obstetric Triage and Emergency Care Protocols* (New York: Springer Publishing Company, 2017).

A MORES such as this one allow for rapid, real-time, two-way communication to assist in early problem identification and prompt referral to the next level of care. Such systems provide a closed-loop mechanism in which the person receiving the information repeats it back to confirm their understanding with the sender, and the sender confirms it to "close the loop." Closed-loop systems have been shown to reduce error and decrease confusion. The use of a freely available and confidential platform like WhatsApp allows facilities to prepare for incoming patients, preventing delays upon patient arrival and providing a feedback loop between providers.

RECOMMENDATION

The Liberian Ministry of Health can reduce decision-to-delivery times and associated procedural delays, thereby saving lives, by:

- standardizing the communication and referral systems and

- introducing complementary obstetric triage assessment tools, such as a MORES, to prioritize care and manage obstetric emergencies.

# Scaling Up Effective Tools Creates More Efficient Health Systems

Research shows this MORES was not just feasible and acceptable to users, but it also increased coordination and accountability among health workers.[4]

As part of their implementation of an essential package of services, the Ministry of Health in Liberia encourages community birth attendants to refer pregnant women to health facilities. As a result, Liberia's rate of facility-based deliveries more than doubled between 2004 and 2017, from 37% to 80% of all deliveries, with most of the increase in rural areas. Notably, the cesarean rate did not rise along with this increase, suggesting that system improvements like this MORES intervention can help women get the care they need.[5]

In rural areas of Liberia, almost 4% of births are cesareans, far below the 9% to 19% that the World Health Organization estimates is necessary to prevent maternal and neonatal mortality.[6] Although women with obstetric emergencies are reaching hospitals, poor internal hospital emergency communication systems could be preventing them from receiving prompt care when they arrive.[7] Liberian researchers in the Bong County pilot showed that the MORES intervention was associated with approximately 1.8 times higher cesarean rate, indicating that improved communication may be improving the response to emergency obstetric cases.[8]

Example of a closed-loop communication system

Sample conversation between a health center and hospital during obstetric referral.
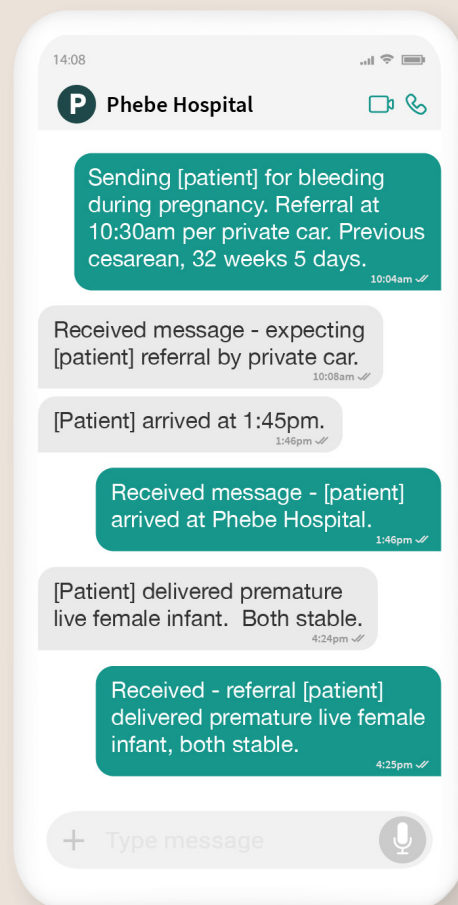
This MORES intervention, combined with the Ministry of Health's existing implementation of an essential package of services, could help reduce illness and death through more efficient access to cesarean delivery in Liberia.

RECOMMENDATION

Liberian Ministry of Health officials should invest in replicating the Bong County MORES pilot in other counties and scaling up triage and referral systems to improve perinatal outcomes.

Improving obstetric triage through implementation of this MORES using a WhatsApp-based closed-loop communication system will reduce delays and save lives.

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