mHealth in Maternal, Newborn, and Child Health Programs around the World

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INTRODUCTION

mHealth refers to "mobile health:" the incorporation of mobile devices like cell phones into the delivery of healthcare. Mobile communication employed in the delivery of healthcare are used to improve health outcomes by increasing access to healthcare and health information – offering the utility to disperse up-to-date public health information directly to patients, issue timely reminders or referrals for treatments, or allow health workers to monitor the spread of disease (*mHealth for Development*, 2009).

OVERVIEW

The United Nation's Millennium Development Goals to reduce child mortality and improve maternal health offer a metric mHealth programs can work to meet. Due to the rapid penetration of mobile phones, particularly in low- and middle-income countries (LMICs), there is a great opportunity to harness mobile technologies in the integration of healthcare delivery for maternal, infant and child health.

Current Scientific Knowledge in Maternal, Newborn, and Child mHealth

The World Health Organizations' mHealth Technical and Evidence Review Group (mTERG) for reproductive, newborn, and child health, is a pioneer in the field of mHealth. The coalition is a compilation of experts from the fields of health, academia, and research institutions. The WHO mTERG recognizes that decision-makers in low and middle-income countries are faced with a multitude of information about mHealth tools and systems with little instructions on how to select the best approach of implementing mHealth tactics. The coalition provides guidance on selecting appropriate mHealth initiatives. Included in mTERG is Dr. Marleen Temmerman, a medical doctor and Belgian Senator. As a gynecologist, Dr. Temmerman is an international leader in maternal healthcare. Through her work on assessing the impact of syphilis in pregnancy outcomes in Kenya, Dr. Temmerman champions for improvements in healthcare of disadvantaged populations and for the reproductive rights of women (Temmerman, 2000).

Aaltje Camielle Noordam, a scholar from Maastricht University in the Netherlands and affiliated with UNICEF, creates an evidence-base for mHealth projects, focusing mainly on the delay in care and how to provide more efficient healthcare access (Noordam, 2011).

A professor of Global Health Policy at New York University, Karen Grepin researches opportune avenues for improvements to maternal and child healthcare, particularly in low and middle-income countries (Grepin, 2013).

Dr. Seth Noar, a professor at the School of Journalism and Mass Communication at the University of North Carolina at Chapel Hill, leads the charge in understanding how to best communicate with patients. Dr. Noar is testing message design theories and frameworks to best understand what types of messages will be most memorable and call to action the receiver (Noar, 2012).

Mobile Communication in the Delivery of Healthcare

The use of mobile and wireless communication technologies to support health objectives has the potential to change the face of healthcare delivery worldwide (Aahman, 2014). Driving this change are rapid advances in mobile technology, a rise in new opportunities of integrating mobile devices with user-friendly backend systems and a wider increase in mobile cellular networks.

The integration of mHealth into the delivery of care offers significant opportunities to increase access to public health information in low and middle income countries (LMICs), which often struggle with the largest burdens of disease, poverty, and large population growth rates (*Compendium of ICT Applications*, 2007). Increasing penetration and reach of mobile technologies in these regions enables interventions delivered by phone to reach populations in ways that circumvent challenges and constraints of under-resourced healthcare systems (*Compendium of ICT Applications*, 2007). mHealth strategies have been effectively employed in LMICs to increase access to antenatal services,

increase access to education in breastfeeding, improve follow-up visits for mothers and their children and facilitate the delivery of malarial treatment regimens (*Compendium of ICT Applications*, 2007).

According to The United Nations Foundation and Vodafone Foundation Technology Partnership and *Special Delivery: An analysis of mHealth in maternal and newborn health programs and their outcomes around the world*, there are six key applications for mHealth (*mHealth for Development*, 2009):

1. Increasing education and awareness of public health issues.
2. Preventative care.
3. Increasing communication in emergency situations.
4. Data collection.
5. Biometric readings.
6. Training for health workers.

Applying mHealth Tactics to Maternal and Infant Health

Traditional maternal and infant healthcare delivers services to support womens health through the continuum of adolescent sexual health, family planning, pregnancy, postpartum health, and infant health of their child. Health awareness, education and monitoring are tactics employed by mHealth programs to support such traditional services. For example, mHealth tactics have been delivered in programs to increase communication between sexual health clinics and teens or provide contraception reminders via short messaging service (SMS) text (Lim, 2008). Programs like *Text4Baby* in the United States and Russia sends text messages to women who are pregnant or have children younger than 1 year old to provide them with information and reminders to improve their health and the health of their children (Parker, 2012).

While mHealth has positive implications for individuals around the globe, the rise of mHealth

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