

A Look Back to Look Forward: A Multidisciplinary Evaluation of an mHealth Service in Malawi

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Introduction

Prioritized as an innovative opportunity to capitalize on the unanticipated or unprecedented access to telecommunications and computing power, mHealth is being applied at increasing scale and scope to facilitate attainment of the Millennium Development Goals (MDGs) for health. It is already being explored as a strategy for the upcoming Sustainable Development Goal (SDG) focus on Universal Health Coverage (Mehl & Labrique 2014). The special issue on mHealth for maternal, newborn, and child health (MNCH) of the African Population Studies Journal provides an important contribution to the growing evidence in an emergent field. Exploring the use and impact of mobile technology for MNCH primarily in Malawi, this collection of papers range from presentations of results from impact evaluations to exploration of equity and human rights approaches to mHealth and highlights many of the opportunities and challenges of the present day and those we ought to address in the future. It illustrates the growing trend towards assessing the impact of mHealth for MNCH through the measurement of standard indicators for MNCH, applying

more rigorous experimental and quasi-experimental designs with statistically significant sample sizes and more advanced exploration of equity, human rights based approaches, and emerging policy issues. It also helps to fill in some critical gaps in the evidence base (Philbrick 2013).

mHealth is often touted for its ability to increase access to and coverage of services, facilitate task shifting services from facilities to communities to households, generate efficiencies, and improve quality of care. It is increasingly included as a strategy in prominent global initiatives including Every Woman Every Child, the Child Survival Call to Action, the Every Newborn Action Plan and the UN Commission on Life-Saving Commodities for Women and Children's Health. Each paper sheds light on an important aspect of mHealth in ways that increase accountability and inform national scale up as well as the broader mainstreaming of mHealth into health systems and domains.

Taking a Human Rights Based Approach (HRBA) and factoring in issues of equitable access to mobile phones into consideration, Chipatala Cha Pa Foni (CCPF) or "health center by phone" in Malawi designed their program as an Interactive Voice

Recognition (IVR) service that could be accessed by any mobile phone and engaging community volunteers equipped with mobile phones to improve understanding of and access to the service. The hotline is serviced by staff who are trained in the Ministry of Health's curriculum for community health workers (CHWs) equipped with software uploaded to touch screens to help identify and respond to clients' information needs and provide referrals to services as appropriate.

Papers in this collection highlight positive, negative, and no changes to key health outcomes related to maternal and child health of CCPF. The program and the evaluations conducted surrounding it also illustrate the power of leveraging data generated by the system to assess its impact (Mechael et al. 2012).

While this collection is focused on mHealth in particular, the papers individually and together signal some of the predominating trends in the use of information and communication technology (ICT) in the health sector- including advancements towards scale, growing evidence, convergence with eHealth into what is increasingly being called "digital health", and dynamism and changing landscape of technology ownership and capabilities alongside greater concerns over sustainability and the enabling environment.

The first paper, *Fostering the use of quasi-experimental designs for evaluating public health interventions: Insights from an mHealth project in Malawi*, showed large positive effects on utilization of home-based treatment for child health and home and facility based treatment for maternal health. While achieving statistically significant results, this two arm, quasi-experimental pre-post design

to assess the impact of a health hotline and mobile message tips and reminders on knowledge and use of services, showed a dramatic mis-match between knowledge and uptake of the service- which is not uncommon among mHealth programs. As the service is adopted for national scale up, greater effort is needed to increase uptake through community mobilization.

Two papers provide a direct contribution to the growing body of mHealth evidence related to health outcomes, *Improving care-seeking for facility-based health services in a rural, resource-limited setting and Strengthening the home-to-facility continuum of newborn and child health care through mHealth*, delineating the aspects of MNCH for which CCPF is making a statistically significant impact and provide insights into where potential future improvements might be attained. Just as important to knowing where mHealth is making a contribution to improvements in health outcomes is knowing where it is not. Such studies provide insight into future applications of mHealth to MNCH interventions of known efficacy.

In maternal health, the study found a strong positive impact on first trimester antenatal care initiation as well as skilled birth attendance at delivery with no effect on facility-based services for children- in particular uptake of immunization- which is already high in Malawi and facility care for acute respiratory illness. Alternatively, the study on the uptake of home-based care for newborn and child health found a negative impact on facility-based care seeking for fever, and a large positive effect of the mHealth service on the aggregate home-based care for child health (an outcome variable that

combines exclusive breastfeeding until six months, sleeping under a bed net the previous night, and receiving oral rehydration salts when sick with diarrhea). This illustrates a contribution by mHealth to alleviating burden on the health system and creating efficiencies through a shift towards home and community-based care. While there is a significant push to community case management (CCM) for childhood illness in Malawi - as is the case throughout low and middle income countries - the study recommends expanding the program to link in CCM to bridge the gap between home and facility-based care.

Both papers, identified “treatment on the treated” estimate as a more appropriate method of analysis due to the significant gap between those who knew about the service and those who actually used it and then engaged in health-seeking behaviors of interest, showing the incremental benefits that mHealth can generate particularly on health outcomes that are in greater need of improvement. They also highlight the strong inter-play between mHealth services and home- and facility-based care-seeking behaviors and the demand creation and supply of critical health services, particularly the availability of essential medicines and vaccines.

Beyond health outcomes, it is important to consider how a service is designed and the subsequently monitored and evaluated from the outset. Using a Human Rights Based Approach (HRBA) – a common lens informing the work of various UN agencies and large NGOs- helped to engage in a participatory design process to identify potential innovations – resulting in a contest for which a hotline and clinic booking system were the top

two winners. The resulting service is CCPF. Using the same lens for evaluation highlighted some key issues for consideration within the program, including availability and access to health services for which demand is being generated, acceptability of the service, quality, participation and accountability, as well as confidentiality when engaging community volunteers.

Where there is no phone: Extending the reach of mHealth to Individuals without personal phones in Balaka District, Malawi- examines a critical equity issue in mHealth, delivery of mHealth services to those who don't have access to a phone. While a significant majority of mHealth programs in low and middle income countries focus on maternal, newborn, and child health with the primary target beneficiaries as female caregivers, pregnant women, and mothers- a focus on gender in the design and implementation of such programs is often lacking (Deshmukh & Mechael 2013). A study by Vital Wave Consulting conducted in 2010 found that in Africa, women were 23% less likely to own a mobile phone (Vital Wave Consulting 2010). In 2012, the mHealth Alliance set out to address this specific issue and developed Addressing Gender and Women's Empowerment in mHealth for MNCH: An Analytical Framework (Deshmukh & Mechael 2013). This framework, examines the mechanisms for the inclusion and empowerment of women as beneficiaries, health workers, policy makers, and technologists (Deshmukh & Mechael 2013).

As mHealth applications and services advance towards scale, there has been a dramatic increase in country leadership and ownership, with mobile technology included in national health strategic plans and budgets in many countries including

Malawi (Batavia & Kaonga 2014). Overall we have seen key mHealth barriers and gaps identified in 2010 and 2011 (Mechael et al. 2010) become systematically addressed through landscape assessments and national stakeholder processes – including advancements in evidence (Philbrick 2013), standards and interoperability (Payne 2013), sustainable financing (Vital Wave Consulting & mHealth Alliance 2013), policy and capacity. With scale come critical questions about nationally accessible connectivity and power infrastructure, sustainability as well as the enabling policy environment—particularly in relation to privacy and security (Trust Law Connect & mHealth Alliance 2013). Countries are now adapting and applying the WHO-ITU eHealth Strategy Toolkit (WHO & ITU 2014) to establish governance and leadership structures and put into place the building blocks needed for national digital health systems that will help to shape short and long-term investments in mHealth.

As illustrated in this rich collection of papers, the move from impact to scale and sustainability for mHealth for MNCH commands a range of approaches from health outcomes research to stakeholder and policy mapping and analysis to human rights and equity. This will continue to be made possible through multi-disciplinary approaches and partnerships as well as long and short-term investment in the enabling environment and learning more along the way of what works, why it works, how it works, and what it costs.

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