Evaluating the Impact of a Free SMS Information Service on Family Planning Knowledge and Behavior in Kenya

Douglas Johnson, Randall Juras, Pamela Riley, and Benjamin Woodman

Introduction

Despite substantial progress in recent years the unmet need for family planning in Kenya, estimated at 25.6% of married women, is still high.[1] One factor which may contribute to high unmet need is lack of knowledge of, and misconceptions about, contraceptive methods. While overall awareness of family planning methods is relatively high in Kenya, with 95% of women and 97% of men able to name at least one method of family planning, awareness of certain methods is low. For example, the proportion of women aware of the lactational amenorrhea method, emergency contraception, and male sterilization was less than 40% for each method. The mobile for Reproductive Health platform (m4RH), developed and implemented by FHI360, seeks to address this lack of knowledge by providing information on family planning methods via a free short-message service (SMS). Users who access the system by texting "m4rh" to an SMS short code are first sent a menu listing nine family planning methods along with a "keyword" for each. Users then SMS the keyword for the family planning method they want to receive information about and are sent a short, clear SMS with information about that family planning method. Users may request more information on the benefits, side effects, and common misconceptions of the methods. In addition to receiving information about family planning methods, users may also request a list of health facilities in their region which provide family planning counseling and services. The system is free and confidential.

In this study, we seek to estimate the impact of access to the m4RH service on 1) knowledge about family planning methods and 2) use of contraception methods. The study uses a randomized controlled design, assigning all new users of m4RH to either a treatment or a control group. Users assigned to the treatment group receive access to the full m4RH service while users assigned to the control group instead receive a set of text messages stressing the importance of family planning. Users assigned to the control group are told that they will not have access to the m4rh content regarding methods for 3 months, but will receive full access after that time. Impacts will be estimated by comparing knowledge and use of family planning methods between the treatment and control groups using data collected through SMS and phone surveys during the three-month study period.

Because not much is known about collecting data for an impact evaluation with mobile phones, we conducted a preliminary pilot study, also using a random assignment design, to determine the most effective incentives, timing, and response options for the surveys. Each user was assigned to receive one of three incentive amounts (50ksh, 100ksh, or enrollment in a lottery), one of two timings (either immediate or next day), and one of four sets of survey response options. Data collection for the pilot phase was completed mid-September, 2013 with 905 new m4RH users enrolled. Enrollment and random assignment of an anticipated 8,500 additional participants will begin on October 1, 2013.

[1] Kenya National Bureau of Statistics (2010), *Kenya Demographic and Health Survey 2008-2009*.

Background and Literature Review

SMS has been used for a wide array of health-related purposes including disease management, sexual health promotion, and health education. Examples include a national health information service in Bangladesh providing stage-based messages for pregnant women tied to their due date,[2] and a text campaign to promote HIV/AIDS testing in South Africa.[3] The strongest evidence of SMS-based health interventions is in the area of adherence to treatment (e.g. Lester *et al*., 2010),[4] and SMS has been shown to be a safe and effective method of communicating test results to patients (e.g. Menon-Johansson *et al*., 2006).[5] The m4RH platform that is the subject of this study was designed by FHI360 as a health-education tool, with the goal of increasing knowledge about and use of family planning methods. Yet, to the authors' knowledge there have been no rigorous evaluations of the impact of any SMS-based family planning education platforms. Mechael (2010), in a report commissioned by the mHealth Alliance, identified lack of evidence on impact as a major gap in knowledge of mHealth initiatives.[6] In addition, not much is known about collecting data for an impact evaluation with mobile phones

The m4RH initiative was the subject of a pilot study intended to determine the feasibility and reach of the program in Tanzania, but not its impact.[7] In addition to asking demographic questions and questions about how users found out about the system, this pilot study included an open-ended text question asking users how m4RH had altered their family planning behavior. The results suggest that some users changed their family-planning methods after accessing the system.

This study will rigorously estimate the impact of m4RH on users' knowledge and use of contraception thus allowing policymakers to determine whether an SMS platform is an effective means of promoting reproductive health education. In addition, the pilot phase of the study will provide valuable information on using mobile phones to collect survey data for an impact evaluation.

Research Questions

The study will attempt to answer the following two primary research questions:

1. What is the impact of accessing the m4RH service on knowledge about family planning methods?
2. What is the impact of accessing the m4RH service on use of contraceptive methods?

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[2] Mobile Alliance for Maternal Action Bangladesh, http://healthunbound.org/mama/

[3] Project Masiluleke, http://healthmarketinnovations.org/sites/healthmarketinnovations.org/files/FINAL_ProjectM042011_0.pdf

[4] Lester, R. T., Ritvo, P., Mills, E. J., Kariri, A., Karanja, S., Chung, M. H., ... & Plummer, F. A. (2010). Effects of a mobile phone short message service on antiretroviral treatment adherence in Kenya (WelTel Kenya1): a randomised trial. *The Lancet*, *376*(9755), 1838-1845.

[5] Menon-Johansson et al (2006)

[6] Mechael, P., Batavia, H., Kaonga, N., Searle, S., Kwan, A., Goldberger, A., ... & Ossman, J. (2010). *Barriers and gaps affecting mHealth in low and middle income countries: Policy white paper*. Columbia University. Earth institute. Center for global health and economic development (CGHED): with mHealth alliance.

[7] L'Engle, K, H. Vahdat, E. Ndakidemi, C. Lasway, and T. Zan (2013). "Evaluating feasibility, reach and potential impact of a text message family planning information service in Tanzania." Contraception, 87(2), 251-256

In addition to generating evidence regarding these two questions, secondary analyses will test non-experimental hypotheses such as the effect of dosage and the impact of *use of* (rather than *access to*) the system.

Study Design and Data

The study sample consists of all new users accessing the m4RH system in Kenya during the study enrollment period beginning Oct. 1, 2013, which we anticipate will be 8,500 new users. An intensive promotional campaign, based on findings from the Tanzania pilot, is being simultaneously undertaken to boost enrollment during the study period. Treatment assignment is at the individual (i.e. mobile phone) level: all users are assigned to either a treatment group with full access to m4RH , or to a control group that receives only a set of motivational text messages stressing the importance of family planning.

Data on knowledge of family planning methods and use of modern contraception will be collected through a set of short SMS-based surveys, similar to those administered in the earlier pilot study of the m4RH program. Surveys will be administered at baseline (shortly after first system access), one month after first accessing the m4RH service, and again three-months after first accessing the service. Each SMS survey will ask only six questions in order to ensure a high completion rate. An estimate of each user's knowledge of family planning will be constructed using the total number of correct answers, as follows.

1. *Short-term knowledge*, measured as the number of correct answers for knowledge questions on the one-month follow up.
2. *Long-term knowledge*, measured as the number of correct answers for knowledge questions on the three-month follow up.

Similarly, the single behavioral outcome will be measured as the respondent's self-reported use of any type of modern contraception (selected from a list provided to the user).

In addition to these outcomes, qualitative data will be collected through semi-structured phone interviews with a small (30) sample of users of the m4RH service. During the phone interviews users will be asked questions such as why they accessed the m4RH service and what advantages and disadvantages they perceive in using m4RH as a source of information on family planning. This additional qualitative data may provide insights into the potential ways in which m4RH affects users. In addition, phone respondents will be asked questions designed to verify the answers they provided in the SMS survey as a measure of reliability.

Expected Findings

Preliminary findings will be available in March 2014. Measuring the effect of m4RH on the subsequent family-planning knowledge and behavior of participants with a randomized controlled design allows for a straightforward analysis. While the treatment-control mean outcome comparison would provide an unbiased estimate of the true impact, the authors will calculate impact estimates using multivariate regression models that predict outcomes as a function of assignment to the program group and participant baseline characteristics such as age, gender, and marital status. Controlling for baseline characteristics will improve the statistical precision of the impact estimates for a given sample size and neutralize chance differences in characteristics between the treatment and control groups. Because we anticipate a non-

trivial rate of non-response, multiple imputation will be used to impute missing outcome values in this analysis as recommended by Puma, et al. (2008) and we will conduct an analysis of non-response to determine whether non-response has affected the comparability of the treatment and control groups in the final analytic sample.

We will estimate the intention-to-treat effect using a regression model of the following general form:

$$Y_i = f(\alpha + \beta * T_i + \delta X_i + \varepsilon_i)$$

where Y_i indicates individual i's knowledge or behavior, T indicates whether the respondent was assigned to the treatment or the control group, and X is a vector of observed baseline covariates.

Random assignment for the pilot phase of the study ended on September 24, 2013 with 905 study participants enrolled. Analysis of these data is underway.