Evaluating the feasibility and acceptability of sending pregnancy and abortion history surveys through SMS text messaging to help reach sustainable development goal 3

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ABSTRACT

Introduction: In Kenya, abortion is illegal under most circumstances, yet about 48 abortions per 1,000 women occurred in 2012. Given the stigma around abortion, little is known about the availability of safe abortion. Thus, we explored the feasibility and acceptability of using SMS mobile surveys to collect information about women's pregnancy and abortion histories in Kenya.

Methods: We sent a one-time mobile survey to 500 18–24 year old women who had opted-in to a 16,000-person mobile survey panel. Women elected to answer questions about pregnancy only (number of pregnancies, number of births, age at first pregnancy) or pregnancy and abortion (ever tried to obtain an abortion and whether medical treatment was sought for any complications). The final question for all survey versions was an open-ended question asking respondents how they felt answering these questions.

Results: 356 (71%) responded to the initial survey question and 333 (94%) consented to answer questions about pregnancy. Of these, 233 (70%) agreed to answer questions about just pregnancy and 76 (23%) agreed to answer questions about pregnancy and abortion. Three-quarters of respondents indicated that they had positive or neutral feelings about answering these questions over SMS. Lastly, all data was retrieved within 24 h of survey distribution allowing for immediate analysis and dissemination.

Conclusion: Women's willingness to share their pregnancy history suggests mobile surveys are a cost-effective and accessible method for gathering information on abortion in Kenya.

1. Introduction

1.1. Unsafe abortion in Kenya

Reaching the Sustainable Development Goal (SDG) 3 of reducing the global maternal mortality ratio by 2030 requires reducing the number of unsafe abortions. Globally, approximately half [1] of the estimated 56 million induced abortions around the world [2] are estimated to be unsafe, resulting in between 8 [3] and 15% [4] of all maternal deaths worldwide.

In Kenya, the estimated abortion ratio is 48 abortions per 1,000 women of reproductive age, or about 464,700 induced abortions in 2012 [5,6]. Kenya's constitution was revised in 2010 to permit abortion under broader circumstances [7]. Still, most abortions in Kenya (75%) are considered unsafe [6], meaning they are performed under conditions and/or by personnel that do not meet minimum medical standards [8]. Almost a quarter of women who have had an abortion seek subsequent treatment in health facilities for complications ranging from minor to severe (e.g., hemorrhage or sepsis) [6,9]. While unsafe abortion contributes to a large proportion (18%) of maternal deaths in the Eastern Africa region as a whole [1], in Kenya the estimate is nearly twice as high: one-third or more of the estimated 5,500 or more yearly maternal deaths [10] may be attributed to unsafe abortions [11–13]. However, due to stigma and legal/policy restrictions, we lack

information on the numbers and causes of unsafe abortion and how they impact SDG 3 in Kenya.

1.2. Mobile as a data collection method

Previous studies have shown that abortion stigma limits the willingness of women to report abortion experiences in national surveys or qualitative interviews [8,14,15]. Due to the private nature of mobile communication without an in-person interviewer, mobile data collection has been shown to reduce social desirability bias [16,17], especially when reporting sexual behaviors [18]. Similarly, survey participants have been found to more accurately report potentially stigmatizing answers when asked electronically than when asked by an interviewer [19–21]. Past studies have addressed the use of mobile technology for follow-up communication after abortion procedures [22,23] and for the systematic collection of health facility data [24], but to our knowledge no published studies have evaluated the use of short message service (SMS) text messaging to survey women on their abortion experiences.

In hard-to-reach parts of the world, the growth in access to and trust of mobile phones has made mobile messaging a valuable tool for communicating with populations who may be difficult to reach [25–28]. In Kenya, about 82% of people own a mobile phone, and of these, 80% use them for sending SMS messages [29]. We hypothesize that the spread of mobile phones and their usefulness in collecting data on sensitive topics suggests that SMS text messaging could be a novel way to generate better estimates of abortion incidence, to develop a better description of the contribution of unsafe abortion to maternal morbidity, and consequently, to inform policies and programs targeted at reaching SDG 3. In this paper, we present results from the initial phase of an iterative, multi-phase pilot project exploring the feasibility and acceptability of using SMS mobile surveys to collect information on Kenyan women's pregnancy and abortion histories.

2. Methods

2.1. Study design and study population

In May 2016 we sent a one-time mobile SMS survey to a random sample of 500 women in Kenya aged 18–24 years who had previously opted-in to a 16,000-person survey panel through mSurvey, a Nairobi-based mobile data collection company. mSurvey has been using in-person enumerators to continuously recruit a convenience sample across Kenya since 2012. Eligibility for the mSurvey audience network is: 1) ownership of a mobile phone for personal use; 2) English literacy; and 3) ability to send and receive SMS and audience members agree to receive both research and market surveys. Over half of the mSurvey sample (56%) is 18–24 years old, therefore we chose to include only this age group assuming they would be more representative of the general population than older age groups in the sample.

2.2. Study procedures

SMS allows for a maximum of 160 characters per survey question, so the consent was separated into three initial questions that briefly described confidentiality, voluntary participation, and compensation. If the participant responded 'no' to any of the three initial consent questions, she was advanced to the end of the survey and thanked for her time. To ensure women were comfortable answering sensitive questions, they were able to choose which types of questions they would be willing to answer: pregnancy only or pregnancy and abortion. Women who were willing to answer questions about pregnancy only received survey version A which included questions on number of pregnancies; age at first pregnancy; and number of times the respondent had given birth. To allow for comparisons, those who agreed to answer questions about pregnancy and abortion were randomized through mSurvey's

computer-generated algorithm to receive either survey version B (questions about abortion only) or survey version C (questions about both pregnancy and abortion). Survey B and C's abortion items asked whether the respondent had ever tried to obtain an abortion; if so, whether she was successful and whether she sought medical treatment for any complications. Survey C additionally asked if the respondent had ever *thought* about having abortion. The final question in each survey version asked respondents how they felt answering the questions, allowing for a 160-character open-ended answer. Birth year, county of residence, and gender data were collected by mSurvey during recruitment into the audience network and appended to the study dataset for analysis.

In the mSurvey system, participants are pushed an SMS message with a single survey question, and depending on the question format, may respond with numbers, words, or phrases using the mobile phone keyboard. After responding, the next survey question is immediately texted. Participant responses in the mSurvey system are anonymized to protect privacy. The system randomly assigns a unique user ID to each participant which separates their mobile number (MSISDN) from their data, making it nearly impossible to link responses with user identities. Access to data is protected using overlapping security features including encrypted secret passwords. The final message instructs the participant to delete the messages from her phone for privacy.

For this study, participants were not charged any money for sending or receiving SMS messages. Upon completion of the survey, participants automatically received 50 Kenyan shillings (Ksh) (approx. $0.50 USD) in phone airtime directly sent to their mobile device as study compensation. At the end of the survey women were also given the contact phone number for a sexual and reproductive health information hotline that they could call with questions. The study was reviewed and given expedited approval by the Emory University Institutional Review Board.

2.3. Analysis

We assessed the feasibility of using SMS mobile surveys to better understand abortion history of women in Kenya via response rates and drop-off rates. We also assessed the quality and plausibility of responses. Acceptability was measured by participants' willingness to provide answers to sensitive questions, by comparing drop-off rates between survey versions A and B/C, and a content analysis of the final open-ended question examining how participants' feelings about answering the questions varied by survey version and past experiences with abortion.

We present here descriptive analyses of the quantitative data and a brief content analysis of the qualitative data. Statistical analysis was conducted using STATA version 14.2 [30]. Content analysis of the open-ended data was conducted by two researchers who reviewed and coded participant responses and examined variations in responses using Excel matrices.

3. Results

3.1. Feasibility: willingness to answer questions about abortion via text messaging

The survey notification was pushed to 499[1] female mSurvey audience members between the ages of 18 and 24. 356 women (71%) opted in and of those, 94% (n = 333) agreed to answer questions about their pregnancy history. Of these, 70% (n = 233) agreed to answer questions about only pregnancy and received survey version A; 23% (n = 76) agreed to answer questions about pregnancy and abortion and received

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[1] The survey notification was initially pushed to 500 audience members but one mobile number was returned as undeliverable.