Evaluating the Feasibility and Acceptability of Sending Pregnancy History Surveys through SMS Text Messaging in Kenya

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Introduction
In Kenya, the abortion rate is approximately 48 abortions per 1,000 women of childbearing age [1]. As is common in countries where abortion is restricted, most abortions (75%) are considered unsafe [2] and one-third of maternal deaths can be attributed to unsafe abortions [3, 4]. A major challenge to reducing the burden of unsafe abortion in Kenya is the ability to gather reliable data. The stigma surrounding abortion limits the willingness of women to report abortion experiences in surveys or qualitative interviews, increasing underreporting and limiting researchers’ ability to study the subject [5-7].

In the area of health, mobile data collection has been proven to reduce social desirability bias [8, 9] especially when reporting sexual behaviors [10], and has become a valuable tool for communication with hard-to-reach populations [11-14]. Given the high mobile penetration in Kenya (82%) [15], we seek to evaluate the feasibility and acceptability of using SMS mobile surveys to collect information on Kenya’s pregnancy and abortion histories. We report here on Phase 1 of this iterative, multi-phase pilot project that aims to inform the use of mobile surveys as a medium for abortion research.

Methods
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 be part of a panel through mSurvey, a Nairobi-based mobile data collection company. mSurvey has recruited a mobile audience network of over 16,500 individuals across Kenya who have opted-in to receive both research and market surveys. 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. While the platform has been previously used for data collection in public health research (with study-specific external recruitment), this study is the first time the existing opt-in audience network was engaged for public health research.

Survey Format
SMS survey questions were sent to the study population in sequential order: after answering a question, participants automatically received a text message with the next survey question. Depending on the question content, participants were asked to respond with numbers, words, or phrases using their mobile phone keyboard.

SMS allows for a maximum of 160 characters per survey question, so consent was separated into three initial questions that briefly described confidentiality, explained that participation was voluntary and allowed the woman to choose which types of questions she would be willing to answer about pregnancy: pregnancy only or pregnancy and abortion. If the participant responded no to any of these three initial consent questions, she was advanced to the end of the survey and thanked for her time. Upon completion of the survey, participants automatically received 50 Kenyan Shillings (approximately $0.50 USD) in phone airtime directly sent to their mobile device.

Participants received one of three survey versions. Women who responded that they would be willing to answer questions about pregnancy only (and not abortion) received survey version A that included only
questions about pregnancy. Women who responded that they would be willing to answer questions about pregnancy and abortion were randomized in a 1:1 ratio to receive either survey version B (included only abortion questions) or survey version C (included both pregnancy and abortion questions). The final question for all three surveys was an open-ended question asking respondents how they felt answering the survey.

**Analysis**

Feasibility was assessed by comparing response and drop-off rates throughout the multi-question consent process and different survey versions. Acceptability was measured by comparing drop-off rates and analyzing the content of qualitative responses.

**Phase 1 Results**

**Feasibility**

The survey notification was pushed to 499 female mSurvey audience members; 356 women (71%) opted in to the survey. Among these, 94% (n=333) agreed to answer questions about their pregnancy history, 5% (n=18) declined, and 1% (n=5) did not respond. Among those willing to answer questions about pregnancy, 70% (n=233) agreed to answer questions about pregnancy only and received survey version A; 23% (n=76) agreed to answer questions about pregnancy and abortion; 6% (n=21) declined to answer either type of question; and 1% (n=3) did not respond. Of the 76 participants who agreed to answer questions on both pregnancy and abortion, 36 received Version B of the survey, and 40 received Version C (Table 1). After consenting, 1% (n=2) of participants did not respond to the first question of the survey: “Have you ever been pregnant?” but otherwise, all questions were answered, including questions about abortion.

**Pregnancy and abortion history**

In this non-representative convenience sample, 58% (n=178) of respondents reported that they have been pregnant at least once. Of the 42 participants who were willing to answer questions on pregnancy and abortion and had been pregnant, 50% (n=21) reported ever having tried to have an abortion. Among these, 81% (n=17) reported that they had been successful and 29% (n=5) of these women reported seeking medical treatment after (Table 2).

**Acceptability**

Among both the pregnancy-only and the pregnancy and abortion survey respondents, approximately three-quarters of respondents reported positive, neutral or “okay” feelings about the survey questions such as feeling “free,” “relieved,” “normal”, or “comfortable.” One woman who received the pregnancy and abortion survey and who had thought about, but not had, an abortion wrote, “It’s good to interact, so I felt free to answer them.” A minority of respondents in both groups reported negative feelings: in the pregnancy only group, 21 of the 233 participants reported feeling “weird”, “awkward”, or “uncomfortable”; in the pregnancy and abortion group 15 of the 76 participants reported feelings such as “weird”, “uneasy”, or “a little bit unhappy.” (There were proportionally more blank responses in survey A and proportionally more responses that mentioned both positive and negative feelings in surveys B and C.)

When we disaggregated open-ended responses by respondent experience with abortion (surveys B and C only) similar trends appeared. Women who reported having had a successfully completed abortion appeared to report slightly fewer positive feelings about the survey questions than women who had never tried to have an abortion. Several women referenced their experiences with abortion, such as this woman from the Rift Valley who had an abortion and had sought follow-up care for it: “Not that secure,

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1 The survey notification was initially pushed to 500 audience members but one mobile number was returned as undeliverable.
but it is great because I have a lesson to tell.” Another woman from the Rift Valley wrote, “Honest but emotional. I aborted when I was 20.”

Lastly, a focus on confidentiality and privacy appeared among some women in all groups of respondents. Some women were concerned about their responses remaining anonymous, such as this woman from the Rift Valley with one abortion and one child who wrote, “Just normal as long as the information is kept disposed to the public.”

**Discussion**

Collecting health information via mobile SMS technology is a relatively new and growing field. In this study, within 48 hours we successfully surveyed 499 women in Kenya showing the speed and efficiency of this method of data collection. We found that women were willing to share sensitive and sometimes culturally taboo information. All of the respondents who agreed to answer questions about pregnancy and abortion completed the full questionnaire, indicating acceptability among respondents. Moreover, among all participants, the majority of respondents indicated that they had positive or neutral feelings about answering the survey questions. Approximately double the proportion of respondents in groups B and C than in group A indicated some kind of negative feeling; this may indicate some increased negativity surrounding abortion questions. However, among the negative responses, the majority of respondents reported feelings of discomfort, sadness, or anxiety, which are expected and common side effects of discussing abortion or culturally taboo subjects—and which can occur with any survey or interview format. There were only five respondents total that reported feelings of privacy invasion and only one of these five received questions on abortion. The overall positive feedback and the limited occurrence of highly negative responses (i.e., “resentful” or privacy invasion) indicate acceptability of questions among respondents, suggesting this is a feasible method for collecting pregnancy and abortion data.

However, using mobile SMS surveys is not without limitations. The 160 character limit of SMS text messages meant questions had to be parsed down, limiting nuance or depth and consent had to be obtained through a series of funneled, somewhat repetitive questions which may have impacted dropout and self selection out of the abortion survey.

Accordingly, for Phase 2, we plan to revise and refine the consent process, question design, and question order. We also plan to explore mobile use of the list experiment, which may provide an improved structure through which to collect sensitive reproductive health data and estimate abortion prevalence in settings where abortion is restricted and highly stigmatized [7, 16].

| Table 1. Survey consent among women 18-24 years old in Kenya who opted in to be part of the mSurvey panel |
|---------------------------------------------------------------|------------------|-----------------|-----------------|
| Are you willing to take a survey? (n=499)                     | Yes % (n)       | No % (n)        | NR\(^1\) % (n) |
|                                                              | 71% (356)       | 29% (143)       |                 |
| Are you willing to answer questions about your pregnancy history (n=356) | 94% (333)       | 5% (18)         | 1% (5)          |

<table>
<thead>
<tr>
<th>What types of questions are you comfortable answering? (n=333)</th>
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<tbody>
<tr>
<td>Pregnancy only (Survey version A): 70% (233)</td>
</tr>
<tr>
<td>Pregnancy &amp; abortion: 23% (76) (Survey version B: n=36; C: n=40)</td>
</tr>
<tr>
<td>Neither: 6% (21)</td>
</tr>
<tr>
<td>NR: 1% (3)</td>
</tr>
</tbody>
</table>

\(^1\)NR = Non response
Table 2. Pregnancy and abortion history among Kenyan women 18-24 years old who fully consented to answering questions about pregnancy (n=309)

<table>
<thead>
<tr>
<th></th>
<th>Yes % (n)</th>
<th>No % (n)</th>
<th>NR % (n)</th>
<th>Survey version</th>
</tr>
</thead>
<tbody>
<tr>
<td>Have you ever been pregnant? (n=309)</td>
<td>58% (178)</td>
<td>42% (129)</td>
<td>1% (2)</td>
<td>A, B, C</td>
</tr>
<tr>
<td>Among those willing to answer questions about abortion and have ever been pregnant (n=42)</td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>Have you ever tried to have an abortion? (n=42)</td>
<td>50% (21)</td>
<td>50% (21)</td>
<td>0% (0)</td>
<td>B, C</td>
</tr>
<tr>
<td>Were you successful? (n=21)³</td>
<td>81% (17)</td>
<td>19% (4)</td>
<td>0% (0)</td>
<td>B, C</td>
</tr>
<tr>
<td>Did you seek medical treatment after? (n=17)⁴</td>
<td>29% (5)</td>
<td>71% (12)</td>
<td>0% (0)</td>
<td>B, C</td>
</tr>
</tbody>
</table>

³ Only asked if answered “Yes” to the question “Have you ever tried to have an abortion?”
⁴ Only asked if answered “Yes” to the question “Were you successful in your abortion?”

References