APPLYING BEHAVIORAL SCIENCE TO FAMILY PLANNING AND REPRODUCTIVE HEALTH CHALLENGES IN SUB-SAHARAN AFRICA

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APPLYING BEHAVIORAL SCIENCE TO FAMILY PLANNING AND REPRODUCTIVE HEALTH CHALLENGES IN SUB-SAHARAN AFRICA

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The Uganda group would like to thank their partner organization in Uganda. We are extremely grateful to the organization for coordinating and making all the necessary arrangements for our site visit. We are also grateful to the organization for its staff’s valuable time and energy, and providing us with important information related to family planning and reproductive health in Uganda. This project would not have been possible without them. We would like to thank Andrew Fertig, Hannah Spring, and Alissa Fishbane from ideas42, for all the help and support in making the site visit extremely productive. We would also like to acknowledge the comments and suggestions received from various participants during our presentation on December 2, 2014 at the ideas42 office.

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The authors, together, would like to thank ideas42 for their patient, generous, and good-humored stewardship of our policy workshop this semester. We give special thanks to Executive Directors and our professors, Piyush Tantia and Josh Wright, for trekking to Princeton on a weekly basis to teach us the fundamentals of behavioral economics and the ideas42 methodology. Their mentorship and guidance was indeed critical in helping us investigate the issues from a behavioral economics lens, and in writing this report.

We want to thank the faculty and staff at the Woodrow Wilson School and Princeton University for the generous financial and institutional support that facilitated travel to Uganda, sub-Saharan Africa, Washington D.C., and New York in addition to the printing of this report. Special gratitude is in order for Dean Karen McGuinness, Gilbert Collins, and Joanne Krzywulak.
PART I: UGANDA
Executive Summary

The ongoing global efforts to address challenges in family planning and reproductive health (FPRH) primarily focus on demand and supply side interventions. Among others, these interventions mainly seek to address the issues of access and information gaps, and pay very little heed to the key role of human behavior and varying circumstances under which people make decisions. While these are valid and relevant approaches, they are unlikely to eliminate all obstacles to the uptake of FPRH services.

In this context, this study is an attempt to address FPRH issues through a behavioral lens. We apply concepts from behavioral economics to explain the low uptake of FPRH services among youth in Uganda. In particular, we focus on youth between the ages of 15 and 25 that fail to uptake a FPRH service after being referred to a clinic by a hotline service run by one of the major FPRH service providers in the country.

We explore this problem through a behavioral science methodology, created by ideas42, which is composed of four stages: define, diagnose, design and test. This process utilized the evidence collected through background research and qualitative interviews with various stakeholders in the referral process, as well as the concepts developed in the behavioral economics literature. As part of the define stage, we find that despite low uptake rates, the large majority of these callers had contacted the hotline with an intention to receive specific FPRH services. Therefore, it seems that many young callers do intend to follow through with the referral, but later fail to turn this intention into action.

Based on this definition of the problem at hand, we identify several behavioral barriers that may explain this intention-action gap, including hassle factors, perceived social norms, saliency, mental models, and anchoring. To address these behavioral barriers, we recommend a set of five context-appropriate and low-cost interventions to increase uptake of FPRH services in our target population. Our recommendations include:

- a lottery with prizes
- an introductory automated message for the hotline
- a new type of e-voucher for youth clients
- guidelines for call operators
- SMS and callback reminders

Finally, the report briefly discusses different ways to test the impact of these designs.
1. Introduction

Uganda has the world’s youngest population with over 79 percent below the age of 30 due to its high population growth rate. Although many Ugandans desire large families, a large proportion of this growth is driven by unplanned births – 4 out of 10 births in the country are mistimed or unwanted. Youth, in particular, are at risk of unintended pregnancies given that marriage and first sexual intercourse occur at young ages, where a quarter of girls between 14 and 19 years of age are mothers or are pregnant with their first child.

Despite the apparent dire need for Family Planning and Reproductive Health (FPRH) and Sexual and Reproductive Health (SRH) services (hereafter, both are referred to as FPRH), many young Ugandans do not utilize these services even when available and free. This was the problem that a major FPRH service provider in Uganda (hereafter, referred to as the “implementing organization”) identified as a critical obstacle to advance their work. The implementing organization found that only 17 percent of young people (aged 15-25) ended up utilizing FPRH services after they were referred through the organization’s hotline.

Existing global efforts to increase uptake of FPRH services have primarily focused on addressing demand and supply constraints. The World Bank’s Reproductive Health Action Plan 2010-2015 committed to supply side interventions such as increasing access to modern contraceptive methods and improving the quality of FPRH services by training health workers. The Report also committed to promoting demand side interventions, such as increasing FPRH knowledge through girl’s education.

While these are valid and relevant approaches, they are unlikely to eliminate all existing determinants of low uptake of FPRH services among youth. Research in behavioral economics and psychology provide valuable insights into other behavioral barriers, which exist even in the absence of demand and supply constraints. We use this approach to address the identified issue by following a systematic behavioral mapping process that utilizes a variety of qualitative and quantitative evidence to inform our recommendations and conclusions.

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3 UBS, 2012.
4 We have chosen to keep the name of the organization we are working with anonymous due to the sensitive nature of the subject, and to protect the confidentiality of employees and beneficiaries who participated in this study.
This report is organized as follows: Section 2 provides a brief introduction to the behavioral economics approach. Section 3 defines the problem this report addresses, and provides context for why this problem exists. Section 4 presents and explains the main diagnoses we have identified along with supporting evidence. Section 5 gives a detailed picture of design ideas to address our diagnoses. Section 6 examines potential approaches for testing the impact of the proposed designs. Finally, Section 7 concludes and provides insights into the potential applicability of these findings to other contexts.

Please note that this report is the product of a collaborative partnership with the implementing organization and our advisors at ideas42. Our work is guided by the implementing organization’s mission of informed consent and choice in all matters. All decisions related to FPRH services are entirely made by the client and the implementing organization is a primary provider of information and services. All names and phone numbers are fictional in this report and we have sought to protect the privacy of all clients and anyone associated with the implementing organization.

2. The Behavioral Economics (BE) Approach

Historically, organizations have utilized traditional approaches to seek solutions to the problems they face. These approaches tend to assume that human beings are rational in their decisions and actions. From this perspective, individuals weigh the benefits and costs of a given choice or action and if the benefits outweigh the costs, they decide to act on it. Unlike the traditional approach, the behavioral approach does not make such assumptions about rationality. Instead, it acknowledges that the human mind is subject to biases and heuristics that can influence one’s decisions and actions. For example, individuals may be overwhelmed by a plethora of choices they face and fail to even make a decision in the first place. Even if decisions have been made, they may not always translate into action due to obstacles that may inhibit that behavior. For example, an individual may have planned poorly and allocated insufficient time to complete the desired task.

With the purpose of applying the BE approach systematically to the issue of low FPRH service uptake, we utilized a four-stage behavioral science methodology created by our partners and mentors at ideas42 (see Figure 1).

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6 Information on the behavioral science process in this report is adapted from Fiorillo, Potok and Wright, 2014. "Applying Behavioral Economics to Improve Microsavings Outcomes". ideas42 and Grameen Bank.
The first stage of the process is define, where we identify the scope of the problem in terms of human behaviors that manifest through individuals’ decisions and actions. This process is free of assumptions about possible solutions to the problem, and is focused specifically on the desired behaviors. In the diagnose stage, we identify key behavioral barriers related to human psychologies and situational factors that prevent youth from utilizing FPRH services. Our findings are based on a variety of sources, such as call data from the hotline, observations of clinics and the hotline center, as well as in-depth interviews with clients, hotline staff, clinic staff, the implementing organization’s management, youth groups, and other organizations doing similar work in the FPRH field in developing country contexts. We spoke with members of both genders, and in our examples below, we often use gender pronouns interchangeably. We also refer to a comprehensive overview of the behavioral economics and FPRH literature within Uganda.

In the design stage, we develop interventions that address the diagnoses. This stage requires multiple iterations, until a small number of feasible and high-impact design ideas are chosen. It is critical that the diagnosis takes place before any solutions are proposed as the solution is only useful to the extent that it targets the problem at hand and failure to follow this sequence can result in unintended consequences. Following this sequence also helps avoid unnecessary spending on testing numerous interventions, and increases the chances of finding successful targeted solutions. Finally, in the test stage, we propose rigorous and scientific methods to test the impact of the proposed interventions. It assesses whether the recommendations are indeed effective, and provides supportive evidence that the identified solutions should be funded in the long-term if found to be successful.

3. Problem Definition

The need for FPRH services in Uganda is evidenced by recent country statistics. On average, Ugandan women age 15-49 intend to have 4.5 births during their lifetime, but in reality they have 6.2 births. This means that women give birth to approximately 1.7 unplanned children during their lives. In rural regions, the gap between wanted and actual fertility
ascends to 2, and among women in the lowest quintile of income it reaches 2.3 children. This gap between intention and action for fertility is one of the highest in sub-Saharan Africa.

In response to the unmet need for FPRH services in Uganda, the implementing organization offers a wide variety of FPRH services throughout the country. Since 2012, one way that the organization has connected Ugandans to these services is through their free hotline. People contact this hotline for advice related to a wide variety of issues, from family planning to symptoms of STIs and cervical cancer. The hotline's call operators are trained to provide advice and information about these sensitive issues, and to refer callers to clinics when there is an apparent need upon the caller's request - all predicated on the client's choice to obtain services. It is important to note that the implementing organization's hotline and clinics are just two possible service channels out of many different outlets that are available to potential clients.

In addition, the implementing organization has taken concrete steps to eliminate financial barriers to the uptake of the services they offer. This is clearly important, as three out of ten of the implementing organization's clients live below the extreme poverty line of $1.25 per day, many of whom are unemployed or farmers. One of the mechanisms for addressing this challenge is through the distribution of e-vouchers, which offer free consultation. Call operators may offer e-vouchers to clients over the phone, which may be redeemed at any of the organization's clinics. While consultation is free with the e-voucher, clients still have to pay for the required service itself. The organization's clinics offer a wide variety of services such as post-abortion care, general medical care, antenatal and postnatal care, and fertility management.

While nearly half of the youth callers are referred to clinics through the hotline every month, only a small percentage actually visits the clinic. Young people between the ages of 15-25 have the lowest uptake rates. In 2014, approximately 1,080 calls were received per month by individuals under 25 year olds. Of these, approximately half (500 on average) were referred to clinics every month. However, only about 17% (85 on average) ended up utilizing the consultation services. Interviews with call operators and clients revealed that despite the low uptake, a large majority of callers had contacted the hotline with an intention to receive specific FPRH services. Given this context, we have defined the primary behavioral problem to be addressed in this project as follows:

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8Implementing organization and major provider are used interchangeably in this report
9 Implementing Organization's proposal to ideas42
10 Implementing Organization's proposal to ideas42
In addition to the primary problem, it is possible that some callers may lack the intention to receive the services in the first place. Young people may contact the hotline for other reasons, such as information, but then agree to the referral to be polite or to avoid questioning if they refuse. While these circumstances were not salient in the interviews, it is certainly an important issue that should be explored in more depth in the future. Given the time constraints for conducting this research project and the clear scale of the problem for young people who do in fact have the required intention, we have decided to focus on this intention-action gap problem.

4. Behavioral Diagnoses

Through the behavioral mapping process, we identified five main behavioral diagnoses that explain the low uptake of FPRH services among youth in Uganda once the hotline client has been referred to a clinic.

**Key Diagnoses**

1. Clients might not follow through with the referral, as there are many logistical steps and hassle factors involved in getting to the clinic.

2. Clients may fear breaking perceived social norms around sexual practices and FPRH service usage.

3. Clients’ FPRH problems may become less salient after the call. Therefore, they no longer see the need to follow through.

4. Clients may have a mental model associating the service provider’s high quality with higher perceived costs of service, which appear unaffordable.

5. Clients may be anchored to the zero cost of consultation offered by the voucher, and are disappointed to find that services are not free.

The following section discusses each of these in detail.
When referred clients decide to visit the clinic, they need to plan for their visit. Planning entails multiple steps – clients need to know the location of the clinic, the hours of operation of the clinic, the cost of the treatment/service, the availability of transport, and so forth. In addition to this information, clients also need to plan ahead of time to arrange the resources needed to finance their treatment, babysitters to watch over their children, and transportation to get to the clinic. These small and seemingly unimportant inconveniences and costs commonly referred to as hassle factors, can have a relatively massive outsized impact on one’s behavior compared to the size of the inconvenience. The significant effect of these factors on human behavior has been documented by several studies (See below H&R Block FAFSA Experiment which is a commonly cited example).

On some occasions, these factors like access to transportation as well as availability of funds to pay for the services are structural constraints that are difficult to tackle behaviorally. For example, if a client cannot pay for the service, the only way to increase access to the service is by subsidizing it. This is not the target population of this diagnosis. Instead, the behavioral insight comes into play for clients who have the ability to finance their visit to the clinic through alternative channels (e.g. savings, borrowing from relative, etc.), but fail to do so because they are overwhelmed by the multitude of things they need to plan for before their visit. The crux of this behavioral insight is that sometimes it is not the hassles themselves, but the cognitive strain induced by the mere presence of hassle factors that overwhelms the clients leading to inaction to plan for the visit.

**Hassle Factors Example: The H&R Block FAFSA Experiment**

FAFSA (Free Application for Federal Student Aid) is the application form used by colleges and universities in the US to determine eligibility for financial aid. The study shows that while many students understand the long-term benefits of filing the FAFSA, they often fail to do so, especially students most in need of financial support. From a behavioral perspective, the gap between the intention to file the application and the lack of action occurs because of hassles in the process. Filing the application is complicated, and involves completing an eight-page form with about 100 questions. When deciding whether to complete the FAFSA, students do not evaluate the potential costs and benefits of filling out

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the form but are swayed by what is salient today. Based on this diagnosis, the experiment found that students who received assistance for completing the FAFSA, and therefore faced fewer hassle factors, were 15.7 percentage points more likely to file their application and 29 percent more likely to enroll in college the next fall than the control group.

**Diagnosis 2: Clients may fear breaking perceived social norms around sexual practices and FPRH service usage.**

A common feature during our qualitative interviews was that most clients did not share information about their call to the hotline or visit to the clinic with another person. Clients often seemed uncomfortable talking about FPRH issues with their family members and were afraid of being seen at the clinic. A call operator mentioned that some callers refuse to go to a clinic in areas near where they live. An employee of the implementing organization identified public perception as a major issue in family planning uptake and services. These factors hint towards a perceived social norm that hinders young people (especially those who are unmarried) from accessing FPRH services, which could be a factor driving the low uptake of services. Social norms are the unspoken rules or standards for people's behavior, and often, it is the perception of social norms that shapes people's behavior. Numerous studies show the power of social norms in influencing youth on health choices (See the Georgetown example below). Within the FPRH literature, a study done in Uganda by the Guttmacher Institute finds that adults refer to unmarried sexually active women as “spoiled” or “wasted”. In this context, these women may be reluctant to seek family planning and sexual reproductive health services, as they may fear being stigmatized.

**Social Norms Example: Reduction of binge drinking on campus**

It has been shown that students overestimate the prevalence of alcohol consumption among their peers and there is a perceived social norm around heavy drinking. Based on this assumption, Georgetown University conducted a social norms campaign to dispel such myths by sharing facts and providing an accurate portrayal of the situation. Data from the National College Health Assessment Survey indicates that as a result of this campaign, the average number of drinks that students reported drinking soon afterwards had dropped

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from 5.05 in 2004 to 4.20 in 2010. Also, the number of students reporting a physical injury as a result of drinking dropped by about 4 percentage points.

**Diagnosis 3: Clients’ FPRH problems may become less salient after the call. Therefore, they no longer see the need to follow through.**

We have identified two possible scenarios that may detract from the saliency of a client’s problem they seek to address through the hotline. The proposed scenarios below are illustrative examples and may not capture all of the complexities of decision-making that clients go through in choosing to access FPRH services.

In the first scenario, the client may be experiencing physical symptoms that make the client’s problem salient (morning sickness in case of pregnancy or a herpes outbreak), and hence the call operator refers the client to a nearby clinic to get a confirmatory test. If the client waits for a few weeks to go to the clinic, the symptoms they were experiencing may disappear and lead the client to erroneously believe that they are not pregnant or do not have herpes. As a result, the need for treatment may become less salient, and clients may fail to go to the clinic to take the test. However, if the client is pregnant, she may be further along in her trimester and not visiting the clinic might be worse for her in the long run. Similarly, if the client has herpes and does not get treatment, the virus remains inside the client’s body leading to recurring outbreaks, which can also be spread to others. In this scenario, physical discomfort serves as a reminder of the underlying condition. We found evidence of these occurrences during the interviews, when call operators noted that during callbacks some clients mentioned disappearance of symptoms as their reason for not visiting the clinic.

The second scenario relates to external drivers that make the need to seek services less pressing. For example, a client may call the hotline seeking FPRH services as she or he currently has a steady partner, and is referred to a clinic by the call operator. However, if the client ends their relationship with their partner before the visit to the clinic, then the need to access family planning services becomes less salient. The change in the client’s relationship status influences their decision to not follow through with the referral even though they may have another sexual partner in the near future and the need for family planning services remains.
With regards to FPRH services, the implementing organization in Uganda is known for providing high quality services. For many items or services, high quality translates into higher prices. This is a type of mental model, which is constructed in “working memory as a result of perception, the comprehension of discourse, or imagination.” Mental models represent people’s thought processes for how things work, are based on unspoken assumptions, and can have substantial effects on people’s behavior (See example below, which captures potential impact of mental models on health outcomes).

The specific mental association between price and quality may occur when a client is offered services for which she or he does not know the price. As such, clients may implicitly assume that the services offered by the provider would be expensive and therefore unaffordable. Contrary to the clients’ belief, the prices charged by the implementing organization’s clinics are actually comparable to or lesser than those of many other clinics. During one of the qualitative interviews, a client who did not follow-up with a referral was shown the price list and remarked that the costs were much lower than what she had originally perceived. This erroneous perception of higher costs may lead clients to decide not to visit the clinic to get the required services.

**Mental models example: Underuse of oral rehydration solution (ORS)**

Approximately, 90 percent of infant deaths that are caused by diarrhea can be averted by the use of ORS. However, ORS use remains low even in regions where it is available and inexpensive. A faulty mental model is the reason for this low usage. When a child has diarrhea, she or he is constantly losing fluids. In this case, giving the child fewer liquids seems a plausible mental model as keeping the child ‘dry’ is better. Between 35-50 percent of poor Indian women believe that reducing fluid intake is the solution for diarrhea.15

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This behavioral insight comes into play for clients who receive e-vouchers at the time of referral. These clients are eligible to receive a free consultation when they visit the clinic, but they still need to pay for the services. However, when the client is offered the e-voucher during the call, the free consultation may anchor them to zero costs. Anchoring is a cognitive bias wherein individuals make decisions guided by an initial value that is available to them (See the potential implications of this bias in the example below). It can be problematic because the initial value may be arbitrary and erroneous decisions can result from this information. Therefore, when clients find out that they need to pay for the service, they may be disappointed and not redeem the voucher. From our interviews, clinic staff highlighted instances when clients with e-vouchers had visited the clinic and failed to even use the free consultation when they received information that they needed to pay for the required services.

**Anchoring example: Estimating the age at which Gandhi died**

In a study by Strack and Mussweiler\(^{16}\), two groups of individuals were asked to estimate the age at which Mahatma Gandhi died. This question was prefaced for one group with the wording: “Did he die before or after the age of 9?” For the other group it was: “Did he die before or after the age of 140?” Even though the numbers 9 and 140 were completely arbitrary, they had an impact on the estimates that the two groups came up with. The first group guessed an average age of 50 and the second, 67. While neither of the groups was close to the actual age at which Gandhi died, 87, this example highlights the effect the initial number (anchor) had on the values estimated by participants of the experiment.

**5. Design Ideas**

We developed a set of five designs that address the behavioral barriers clients face in following through with the referral as described in the previous section. The proposed designs are listed below, and are discussed in greater detail in the following sub-sections.

Proposed designs:

1. A lottery with prizes
2. Guidelines for call operators
3. An introductory automated message for the hotline
4. A new type of voucher
5. SMS and Callback Reminders

The designs were carefully chosen based on our diagnoses. Rather than a one-to-one relationship between the designs and the diagnoses, many of the designs address more than one behavioral barrier. Table 1 illustrates the relationship between the designs and diagnoses.

<table>
<thead>
<tr>
<th>Design</th>
<th>Diagnoses addressed</th>
</tr>
</thead>
<tbody>
<tr>
<td>Lottery</td>
<td>1) Hassle factors</td>
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<tr>
<td></td>
<td>2) Lack of saliency</td>
</tr>
<tr>
<td></td>
<td>3) Anchoring towards zero cost of consultation</td>
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<tr>
<td></td>
<td>4) Mental models associating high quality with higher prices</td>
</tr>
<tr>
<td>Call Guidelines</td>
<td>1) Hassle factors</td>
</tr>
<tr>
<td></td>
<td>2) Lack of saliency</td>
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<tr>
<td></td>
<td>3) Anchoring towards zero cost of consultation</td>
</tr>
<tr>
<td></td>
<td>4) Mental models associating high quality with higher prices</td>
</tr>
<tr>
<td>Automated Introductory Message</td>
<td>1) Perceived social norms</td>
</tr>
</tbody>
</table>

Table 1: Relationship Between Diagnoses and Designs
Bring a Friend Voucher helps combat fears of breaking perceived social norms by encouraging clients to take a friend to the clinic to feel more comfortable.

| Reminders, sent through SMS texts, trigger clients’ memory and prompt them to act on making arrangements to overcome hassle factors in following through with the referral. They also make the FPRH problem salient. | 1) Perceived social norms |
| Reminders for call operators to call back clients ensure that referred clients are reminded of their appointments. | 1) Hassle factors 2) Lack of saliency |

All of the proposed design interventions may be integrated into the implementing organization’s current call-center operating system, and do not require hiring additional personnel to oversee implementation. Furthermore, four out of the five designs can be implemented entirely through the call-center and would not require any outside entity. However, the implementing organization may decide to test all of them or focus on those that are deemed most appropriate and feasible.

**Design 1: Lottery**

To induce clients to follow through with the referral, we propose offering small incentives through a lottery drawn once a month. All clients with pending referrals will be eligible to have their names entered in the lottery once they visit the referred clinic within two weeks of being notified of the lottery. Lucky winners from the lottery draw could win free airtime for 120 minutes from a popular mobile network company, two local football club tickets or free services at one of the implementing organization’s clinics. We suggest offering these particular rewards as they are likely to be popular among youth and will thus incentivize young clients to visit the referred clinic.

**Figure 2: SMS Lottery**

From: Abbo
To: Beneficiary

Congratulations! You have the chance to win 120 Free Airtime minutes. Visit a XXXX or XXXX clinic for your family planning consultation in the next two weeks and you could be the lucky winner!

If you have any questions, call XXXXXXX.
Call operators could send an SMS to clients with pending referrals on the first day of each month to inform them of the lottery and the potential rewards, with a follow up SMS a week later as a reminder. An example of the SMS content (Figure 2) is shown in the side bar. Finally, the lottery could be drawn on the last day of the month. The duration of this intervention should be established on the basis of its effectiveness to increase uptake. The lottery should be stopped once the benefits of increased uptake are equal or below the monetary cost of the prizes.

Lotteries capitalize on people’s tendency to overestimate small probabilities when it comes to earning potential rewards. Even if there is a slim chance of winning, the reward is more salient than the actual probability of getting the reward. Volpp et al. found that offering a lottery ticket with 0.1% chance of winning up to $100 virtually eliminated incorrect usage of anti-stroke medication among patients with a 20% ex-ante incorrect usage rate.

In the context of Uganda, the potential to earn a coveted lottery reward may not only offset the effects of any perceived hassle but also may induce clients to follow through with the referral even if their FPRH concern is no longer as salient. On the other hand, the FPRH problem may become salient again as the lottery reward is linked to the clients’ problem for which they originally called. The potential to earn rewards can also reverse clients’ anchoring towards the zero consultation cost and instead anchor clients to the highly valued lottery reward, thereby increasing the willingness to pay for services. Finally, the likelihood of earning a reward may change clients’ mental model of associating the major provider’s quality services with higher costs, as clients may instead associate the implementing organization with potential benefits (rewards) as opposed to higher costs.

Despite the potential to increase referral uptake significantly, there are some further considerations. If news of the lottery is spread among the hotline’s clientele, then the lottery might lead to perverse incentives. Clients may intentionally delay visiting the clinic in order to have their names entered in the lottery. However, during field interviews in Uganda, most clients reported not telling anyone about their calls to the hotline, which suggests that information contamination is unlikely.

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17 The name of the clinic is blinded to protect privacy.
18 Datta & Mullainathan, 2012.
We developed call guidelines with five features that incorporate multiple behavioral factors to induce clients to follow through with their referrals. While some call operators may already be using some of the features, including them in the call-center protocol ensures that all clients may benefit from them. At the same time, we recognize that call operators are wary of sounding unnatural and too scripted during the call. For this reason, the design suggests guidelines rather than call scripts (See Figure 3 below).

**Figure 3: Call Guidelines**

<table>
<thead>
<tr>
<th><strong>PLANNING UPTAKE</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Make an appointment within two weeks</strong></td>
</tr>
</tbody>
</table>
| "Would you prefer going to a clinic near or far away?"
| "Let’s set a date and time for you to go to the clinic. I will call the doctor/clinic at referred clinic on your behalf and let them know you are coming on X day."
| **Help client plan on getting to the clinic** |
| "How are you getting to the clinic?"
| **Raise awareness about other things to plan for** |
| "What are some of the other things you will need to organize in order to go to the clinic? Who can help you?"

<table>
<thead>
<tr>
<th><strong>E-VOUCHER AND PAYMENT</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Clarify purpose of the voucher</strong></td>
</tr>
</tbody>
</table>
| "The voucher will give you a free consultation. Other services and treatments will require payment."
| **Describe service costs** |
| "If it is clear what service the client needs/wants (e.g., STI testing, circumcision), inform them of the cost. If it is unclear what service the client needs, inform price range of services."
| "This is a one-time cost equivalent to the price of X".

One feature of the guidelines involves making a ‘fake’ appointment to visit the referred clinic, and another involves making a plan for getting there. Making a fake appointment helps create a soft commitment device, which imposes a psychological cost on the client if she or he fails to show up for the appointment, thereby encouraging the uptake of the referral. On the other hand, making a plan with the client helps materialize the client’s intention of visiting the clinic and can help reduce the intention-action gap. Planning
specifically to arrange for transportation or for childcare can assist clients in overcoming barriers due to hassle factors. Moreover, making a plan during the call itself rather than letting the client make a vague plan by themselves decreases the lag between the call and the intended clinic visit and helps eliminate potential effects from reduced saliency of the FPRH problem. Milkman et al. find that individuals are 13% more likely to get a flu shot when asked to make a specific plan.\textsuperscript{19} Similarly, Nickerson and Rogers found that voter turnout increased by 9 percentage points after voters were prompted to think about what time they plan to vote and how they plan on going to the polling station.\textsuperscript{20}

The call guidelines also encourage operators to clarify to clients with e-vouchers that these are valid only for free consultation and not for additional services. For clients who need to get services beyond consultation, clarifying the costs of the services helps shift the mental model that associates the implementing organization’s high quality with higher perceived costs. In addition, it can also help reduce the effects of being anchored to the free consultation cost. Lastly, the guidelines ask call operators to provide some basis for comparing the costs of services at the organization’s clinics to a commonly used product or service in Uganda to emphasize that going to the clinic is an affordable, one-time investment.

In order to ensure that these call guidelines are followed in every referral call, we propose a short training on them. Moreover, we propose including a more concise checklist of items, as illustrated in Figure 4, for the operators’ desk or cubicle.

\begin{figure}[h]
\centering
\includegraphics[width=0.5\textwidth]{call_guideline_checklist.png}
\caption{Call Guideline Checklist}
\end{figure}


\textsuperscript{20} Nickerson, D.W & Rogers, T. “Do you have a voting plan?: implementation intentions, Voter turnout, and organic plan making”. \textit{Psychological Science} 21, no.2 (2010): 194-199.
This design includes adding a short automated introductory message to all calls received by the hotline before they are transferred to the call operator. The automated message is tailored to clients and emphasizes positive descriptive social norms around FPRH usage to de-bias perceived negative norms. Descriptive social norms can be highly impactful, for example, Gerber & Rogers find that messages on expected high voter turnout are effective in increasing actual voter turnout among citizens who vote infrequently or occasionally.21

The proposed content of the message for the implementing organization is shown in Figure 5. It seeks to convey a high usage rate and that FPRH services are used by individuals with similar characteristics to the clients. Such a targeted descriptive social norm message is likely to help combat negative perceived social norms around using FPRH services.

There are some considerations which should be addressed when implementing this design. First, research on how Ugandan youths refer to FPRH services should be carried out and the message should be adjusted accordingly. For example, “family and sexual health needs” may not be a widely understood concept among Ugandan youths. Second, some callers may not understand the message in English as several different languages are spoken across the country and among the hotline clients. Third, it is possible that callers may be annoyed or overwhelmed by the automated voice message.

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In order to further help overcome behavioral barriers related to perceived social norms, we propose a new type of e-voucher called “Bring a Friend Voucher”. We suggest that once clients are offered a regular e-voucher, call operators should ask clients whether they would like to take someone else along to the clinic for a free consultation as well. If the client prefers taking a friend along, he or she should be offered the “Bring a Friend Voucher”, which would be sent via SMS (see Figure 6). The friend can use the free consultation only at the time of voucher redemption by the client. However, the client will also be able to redeem the voucher alone in case they feel constrained by having to find someone to accompany them.

The “Bring a Friend Voucher” aims to make clients feel more comfortable about redeeming the voucher by alleviating the risk of being seen at the clinic and de-stigmatizing clinic visits. However, there is a chance that the friends themselves may be unwilling to accompany the client for precisely the same reasons that hold back the client, such as fear of being seen by someone familiar and judged negatively. In order to induce the desirable behavior, we propose an optional commitment device for the trusted friend. The friend’s name could be entered into a lottery if they confirm the “appointment” at the clinic, and call operators could encourage clients to ask their friend to complete this task.

There are some points that need to be considered before implementing this intervention. First, we need to ascertain whether most Ugandan youths would want to take someone along. Second, it is important to get a sense of whether most Ugandan youths have friends they can trust. Lastly, the additional free consultation for the friend might add to costs although this may be more than compensated by the benefits received by the clients.

Design 5: Reminders

Our final design intervention includes a set of timely reminders. We developed two broad types of reminders – (1) SMS reminders for clients, and (2) reminders for call operators.
**SMS Reminders**

Sending reminders to clients can help trigger their memory and if reminders are sent at an appropriate time, clients can be prompted to act on meeting the referral or on making arrangements to visit the clinic. We propose sending a total of five auto-generated SMS reminders to clients after the initial call. We designed two types of SMS reminder messages- (1) a customized reminder and (2) a generic reminder. Examples of these reminders are shown below in Figure 7.

The customized reminder has information tailored to the client’s referral, such as the “appointment date” that was agreed upon with the call operator. It also provides the address and operating hours of the center that the client agreed to visit. Lastly, for clients who have an e-voucher, it includes the e-voucher code in case clients lost or deleted their initial text. We propose adding the pseudo-name of the call operator to whom the client spoke with to make the message more personal. A total of five SMS reminders should be sent in the following order: 1) On the call day; 2) 7 days prior to the appointment date; 3) 3 days before the appointment; 4) 1 day before the appointment; and 5) On the appointment day.

**Figure 7: SMS Reminders**

<table>
<thead>
<tr>
<th>Customized Reminder</th>
<th>Generic Reminder</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>From:</strong> Julie</td>
<td><strong>From:</strong> Julius</td>
</tr>
<tr>
<td><strong>To:</strong> Beneficiary</td>
<td><strong>To:</strong> Beneficiary</td>
</tr>
<tr>
<td>This is your eVoucher IXT-7K6. You can redeem it at your appointment on 09/12/2014 at XXXXXXX, which is at XXXXXXXX. Opening hours are between 8am and 6pm. Thank you - Julie</td>
<td>REMINDER – Don’t forget your appointment with XXXXX. We look forward to seeing you. If you have any questions, call us at XXXXXXXXXXX. Thank you – Julius.</td>
</tr>
</tbody>
</table>

This design is our optimal design as it is tailored to each client but entails additional technological resources. To automate these personalized SMS reminders, information on the client’s “appointment date” should be added to the call operators’ data capture tool.
The second type of SMS reminder is more generic and requires less sophisticated programming. The message includes a simple reminder and contact information for any questions. As in the case of the customized reminders, we propose including the pseudonym of the call operator to personalize the message. The auto-generated generic messages should also be sent a total of five times. The messages should be sent two days apart, at the usual close of business time, starting with the day of the call.

The effectiveness of this intervention may be limited if clients do not own a phone or ignore the texts completely. Since we are sending only a total of five reminders, which is a relatively small number compared to the number of reminders sent in similar interventions, we believe that the latter will not be a major issue. Another concern relates to protecting the client's privacy and safety since the SMS messages clearly mention an appointment with the major provider. If this is a valid concern, then we propose removing the name of the major provider from the text message.

**Call Operator Reminders**

While call operators follow the protocol on calling back clients with unredeemed e-vouchers a week after the initial call, field interviews with some e-voucher recipients indicated that they did not remember receiving a call back. In addition, some clients who did receive them reported a gap between the initial call and the call backs. To address this issue and routinize the call back process, we propose setting up a systematic reminder for call operators to call back referred clients. These will be auto-generated and should be incorporated into their desktop screens, flashing on the hour to draw the call operator's attention.

Some examples of the reminders are given below. Example 1 (see below) provides information on the number of call backs that need to be made on that day, as well as the names and numbers of the clients with referrals. After completion of the call, call operators can click the box indicating that the call has been completed, which would then be removed from the list of remaining calls.
**Example 1***

*All names and numbers are fictional.

While we expect this approach to be the most effective type of reminder, we are cognizant of the fact that it may require some technical changes. In case the level of programming required is not feasible, we propose using a version that is simpler to implement. As shown below in Example 2, this version provides a basic reminder that the call operator must complete their call backs that day with the link to the specific details for those calls.

**Example 2**

Calling all clients back may be taxing but it helps track referral status, and remind clients to follow through on the referral. Creating a systematic computer generated reminder will also help call operators to be organized and meet their call targets. In addition, the reminders we designed also provide easier access to each client's contact information and the operators do not have to hand-write them on a notepad.

6. Testing

This section presents preliminary ideas about how to test the designs described above.\textsuperscript{22} We propose three evaluation designs to assess all interventions in a rigorous and appropriate manner, depending on the requirements and feasibility for testing each design, as follows: 1) randomized control trial (RCT) for lottery and SMS reminders, 2) quasi-random experiment for Bring a Friend voucher and the automated introductory message, and 3) time-series analysis for call guidelines. While RCTs are considered the gold standard in evaluation, it is not possible to implement for all the designs due to technical

\textsuperscript{22}Details about the methodology and data analysis techniques will be developed further after the proposed interventions are discussed with the implementing organization.
constraints and the high risk of contamination among treatment and control groups. The proposed testing methods are described further below.

**Randomized Control Trial**
For the lottery and SMS reminders, we propose an RCT in which referred clients are randomly assigned into a treatment and control group according to their caller ID number (a unique number based on the caller’s cell phone number and name). The RCT can be implemented in two ways, depending on the implementing organization’s preferences, the available sample size, and funding. **Option 1** is to test both the lottery and SMS reminders under one treatment arm, and estimate the combined impact of both designs. Referred callers that are in the treatment group will receive both SMS reminders as well as lottery invitation. The sample size needed in this case is 1500. **Option 2** is to evaluate the individual impact of each design by having two treatment arms - one for each intervention- and one control group. This is feasible if significant funding and sample sizes (N=2250) are available for the evaluation.

We recommend Option 1, as it provides higher chances of picking up small impacts (i.e., 0.15 standard deviations) from the interventions with smaller sample size and shorter evaluation period. It may also encourage further in-depth evaluation of the individual designs at a later stage after proof of concept has been established.

**Quasi-random Assignment**
For the Bring a Friend voucher and automated introduction, we propose a quasi-random experiment that randomizes calls by weeks into treatment and control groups instead of randomizing by referred caller ID. Those who contact the hotline on ‘treatment’ weeks receive the intervention while those that call during ‘control’ weeks will not receive it. As in the case of the RCT, we could test the automated introductory message and Bring a Friend voucher under one treatment arm (Option 1) or two arms (Option 2). Given large sample size requirements for Option 2, it is feasible to implement Option 1 under which the automated messages will be switched on for all calls and call operators will offer the new voucher to clients concurrently in ‘treatment’ weeks. The impact of these designs can be measured by comparing the incidence of referral uptake between callers from treatment weeks and from control weeks.

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23 Contamination takes place when clients in the treatment group do not receive the intervention or alternatively when clients in the control group do. These events are particularly likely when the call operator has discretion over which clients will receive the intervention, as in the case of the call guidelines and friend voucher. Here, call operators may wish to give everyone the option of a friend voucher or may forget not to help the client plan their visit over the phone.
**Time-series**

To evaluate the impact of call guidelines, we suggest a time-series analysis that will compare the change in uptake rate before and after the call operator guidelines are introduced. We suggest looking at uptake rates at least three months before the intervention and two months after the intervention to assess whether the design had an effect. It is important to note that this evaluation does not control for other factors occurring at the same time as the intervention that may explain the change (or lack of) in uptake. Thus, results should be interpreted with caution.24

As a final consideration, in all of these evaluation designs it is unlikely that we can measure the full extent of the impact of these interventions. We expect that the interventions will have spillover effects to family members and friends who will also be encouraged to uptake FPRH services, and these will likely be missed in an evaluation.

**7. Conclusion**

This report provides a starting point for addressing the problem of low-uptake of FPRH services among youth in Uganda utilizing the behavioral economics approach. After identifying context specific behavioral barriers using a behavioral mapping investigative process, we propose a set of targeted interventions or “nudges” – running a lottery, receiving short reminders, bringing a friend to one’s clinic appointment, helping with planning to get to a clinic and a short introductory message for combating negative social norms. Each individual nudge, and in combination, has the potential to have significant impacts that are low cost, sustainable and scalable.

The lessons learnt through the lens of behavioral economics for the implementing organization in Uganda have applicability to other contexts where the need is just as great. Every year, pregnancy and birth complications result in approximately 350,000 deaths amongst women worldwide, of which 99 percent are located in developing countries. A further 68,000 women die from unsafe abortions every year. Uganda is not alone in its high statistics for unmet need for contraceptives – an estimated 200 million women in 2008 experienced this intention-action gap. Moreover, HIV is the most common reason for deaths and disease amongst women aged 15-49 globally, while an estimated 100 million cases of STIs (excluding HIV) are attributed to young people worldwide.25

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24 A RCT would not be feasible in this case for two reasons. First, it is difficult to make call operators switch back and forth from calls with guidelines to those without. Moreover, there is not enough sample size to randomize at the call operator level.

While international organizations, NGOs and governments are likely to persist in their efforts to target supply- and demand-side constraints, we believe this strategy on its own is unlikely to translate into significant improvements in the uptake of FPRH services. The implementing organization, which also operates hotlines in another 11 countries, has found that the problem of low uptake by youth is not unique to Uganda. In Ethiopia, for example, only 12% of 15-19 year olds end up redeeming their free e-voucher.26 The identified behavioral barriers to uptake, such as social stigmas, hassle factors, faulty perceptions around cost and declining saliency of symptoms, are unlikely to be Uganda specific, and there is evidence in the behavioral economics and FPRH literature to suggest that they are not.27

Naturally, these behavioral barriers may not apply in all contexts or work for all programs that seek to increase the uptake of FPRH services. For this reason, it is imperative that the design ideas recommended in this report are piloted and rigorously tested to confirm their effectiveness in the context of Uganda. Through this process, we can begin to reflect on how these lessons can be applied to other contexts where the implementing organization operates its hotlines, as well other programs that do similar work. A parallel process can then be undertaken to investigate what additional behavioral barriers may exist in these other contexts, and how the suggested designs could effectively be adapted if applicable. Through a combination of these efforts, we can optimistically hope to make a dent in the global need and usage of FPRH services.

27 See behavioral economics studies used to illustrate the psychological concepts. Examples of FPRH literature include World Health Organization (2012) “Contraception Discontinuation and Switching in Developing Countries” Research Policy Brief – which finds that inconvenience in use and cost (hassle factors) of contraceptive methods are a reason for discontinuation. There are a variety of social norms related studies such as Cunningham, Kerrigan, Jennings and Ellen (2009) “Relationships Between Perceived STD-Related Stigma, STD-Related Shame and STD Screening Among a Household Sample of Adolescents”. Perspectives on Sexual and Reproductive Health. Vol. 41, No. 4.
PART II: SUB-SAHARAN AFRICA
1. Executive Summary

Aggressive public and private efforts have expanded the availability of HIV testing and counseling services in sub-Saharan Africa in recent years, but with infection prevalence persisting as high as 15-20%, the region remains the most severely afflicted by the disease anywhere on the globe. Moreover, the staggering number of at-risk individuals unaware of their status – over 50% in certain countries – dramatically limits the reach of HIV treatment and prevention efforts. Newly implemented self-testing technologies may hold the key to more universal awareness, treatment, and containment.

Despite the immense promise of self-testing, however, its success hinges on the intentions and follow-through of individual users: users must choose to take the self-test and then seek follow-up treatment on their own, without the professional supervision, assistance, and counseling that typically accompany HIV testing. In the project described in this report, Woodrow Wilson School students, with the support of ideas42, worked with three NGOs in sub-Saharan Africa to improve its self-testing pilot by recommending behaviorally-informed changes to the program designed to help participants follow through on their desire to get tested and seek treatment.

Specifically, this project has leveraged insights and tools from the field of behavioral economics and the methodology of ideas42, a nonprofit that uses behavioral economics for social good, to identify potential breakdowns in the testing process and strengthen linkages to follow-up care. Fundamental to the ideas42 methodology is the analysis of the different contexts self-test users experience as they choose whether or not to take the self-test and pursue follow-up care. Behavioral economics shows that by making small, strategic changes to these contexts, directly addressing some of these behavioral bottlenecks, we can better empower individuals to follow through on their intentions to get tested for HIV and seek care if they are HIV positive.

In the case studied, the sub-Saharan NGOs are working with participants in several contexts. The NGOs plan to distribute self-tests to participants door-to-door via community health workers. Participants that opt in will receive a self-test they can take on their own at home or any location of their choosing. During the pilot, participants will be asked to return the self-test approximately two weeks later when a mobile clinic visits their community. Participants who test positive can receive follow-up services at the mobile clinic. We thus identified three core contexts users experience: 1) the interaction with the health care worker delivering the self-test; 2) the experience at home, where they choose whether or not to take the test and pursue care; and 3) their clinic experience.
The following proposed intervention designs make small changes to alter these contexts and were developed in collaboration with our partner organizations to support a pilot program and country-wide roll-out of self-test kits. They build on the partner organization’s best practices and suggest new innovations that can increase the effectiveness of their programs while minimizing cost.

**Context: Self-Test Delivery**

*Make a plan to self-test:* We propose helping participants plan to take the test and seek follow-up care by incorporating planning into their conversation with the health care worker delivering the self-test. We suggest that the health care worker specifically ask when the participant plans to take the self-test, both assisting the participant to plan and also committing her to completing the test.

*Make a plan to visit the clinic:* We propose helping participants plan to seek follow-up care through their conversation with the health care worker delivering the self-test. The health care worker should distribute a flyer that includes the time and location of the mobile clinic visit and ask if the participant would like to come to the clinic in the morning or afternoon, marking the flyer with his or her answer. This will both help reduce clinic wait times and help commit the participant to coming to the clinic.

**Context: At-Home Experience**

*Radio self-test demonstrations:* We propose regularly scheduled demonstrations of the self-test over the radio. These demonstrations will allow participants to test along with the broadcast at home. They will make the instructions more accessible for participants, help participants plan to take the test (broadcasts will occur at regularly scheduled times) and remind participants to take the test. Audio and video recordings demonstrating how to take the self-test can also be distributed through social media, for example, Whatsapp.

*Self-test instruction re-design:* We redesigned the self-test instructions to increase salience through the use of graphics, highlighting specific language, and grouping test results and follow-up instructions. To help participants plan to seek follow-up care, we included a place for individuals to write in when the clinic will visit the community.

*Lottery for self-test return:* For the pilot, we propose establishing a lottery at each mobile clinic site that participants may win by returning their self-tests. Winners will be awarded roughly $20 of cell phone airtime. This will minimize costs while providing a significant incentive for participants to return self-tests.
**Context: In-Clinic Visit**

We propose that the NGO expand to mobile clinics their successful static clinic practices:

*Appointment reminder cards*: We propose that the NGO distribute appointment reminder cards at their mobile clinics to help participants remember their next appointment.

*Information/entertainment during wait time*: We recommend reducing the negative feelings associated with waiting in line by playing music and broadcasting football matches. Information on HIV should also be provided to those in line.

**2. Introduction**

Following aggressive public and private campaigns and technological advances, new HIV infections worldwide have fallen by one third from 2001 to 2012. This global decline is in large part attributable to the expansion of the availability of HIV testing and counseling (HTC) services in the world’s most HIV-affected region, sub-Saharan Africa, which has achieved a 34% decrease in HIV prevalence. Despite such dramatic progress, however, several nations in this region continue to face prevalence as high as 15-20% of their adult population. Moreover, the staggering number of HIV-infected individuals unaware of their status – over 50% in certain countries – dramatically limits the reach of HIV treatment and prevention efforts. Newly implemented self-test technologies offer the potential to dramatically expand the reach of HTC services in sub-Saharan Africa. As a complement to the services provided at existing clinics – both public and nongovernmental facilities – self-testing may yield a significant increase in the percentage of individuals aware of their status, bolstering efforts toward HIV prevention and treatment.

Despite the immense promise of self-testing, its success hinges on the intentions and follow-through of individual users: users must choose to take the self-test and then seek follow-up treatment on their own, without the professional supervision, assistance, and counseling that typically accompany HIV testing. Thus, providers must remain cognizant of the behavioral phenomena impacting the success of their efforts. For example, after acquiring test kits, individuals may still fail to ever actually perform the test, or may perform it incorrectly. Similarly, many of those who successfully complete the test may still fail to seek follow-up care, whether consciously or unintentionally. Such bottlenecks would undermine even the most extensive deployment and availability of the technology. The

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29 Ibid. 12.
primary objective of this project has been to mitigate these behavioral pitfalls by designing modest changes to the partner’s existing projects.

This report will first provide a short introduction to behavioral economics and an overview of the project. It will discuss the specific challenges affecting self-testing and briefly identify several behavioral phenomena contributing to those challenges. Later sections will detail the behavioral interventions we have developed across three specific contexts: 1) the delivery of at-home test kits by community based healthcare workers, 2) the decisions and actions taking place in the individual’s home during the self-test process, and 3) subsequent in-clinic follow-up for confirmatory testing and counseling, particularly at nongovernmental mobile clinics. Finally, the report will provide a brief discussion of potential test designs to evaluate the effectiveness of these proposals.

3. The Behavioral Economics Approach

The field of behavioral economics, pioneered by scholars such as Nobel prize recipients Daniel Kahneman and Amos Tversky, combines insights from psychology, economics, and neuroscience to describe and predict human decision-making and behavior more accurately than classical models of economics. Behavioral economics does not assume that individuals simply act in ways that maximize their utility, given numerical costs or benefits of a particular choice. Instead, the field recognizes humans’ bounded rationality, constrained self-control, limited attention, and various everyday mental shortcuts that significantly impact decisions and actions.

The application of behavioral economics to policy has yielded tremendous results across public, private, and nongovernmental domains. Simple rearrangements of the order of choices, changing the way options are presented or “framed,” and reducing perceptions of difficulty of a particular action have improved outcomes in a host of policy contexts. The successes of behaviorally-informed interventions have ranged from boosting organ donation rates to reducing energy usage and littering to increasing employee savings contributions.

For example, when employees are presented with the option to freely “opt out” of corporate savings plans (and are thus initially automatically enrolled), they are significantly more likely to participate than if doing so requires them to actively “opt in.” Such a simple change of the “default” option – which classical economics would predict to be irrelevant to employees’ preference to participate or not – has demonstrated the power of behavioral interventions to increase program uptake and improve social outcomes.
While behavioral economics is not suited to address or overcome structural problems — those which are primarily logistical in nature — it offers a powerful tool to complement otherwise well-designed programs that may suffer from unexpected behavioral challenges, such as low uptake or unanticipated choices.

Our approach applies insights from behavioral economics to the HIV testing, counseling, and treatment context by drawing directly from the methodology developed by ideas42. This framework begins with 1) clearly defining the target challenge, 2) diagnosing where bottlenecks in the process occur and what behavioral explanations may be responsible, 3) developing interventions designed to mitigate or resolve those behavioral bottlenecks, and 4) testing of those interventions to evaluate their effectiveness.

4. Project Overview

The project seeks to apply behavioral economics to an existing pilot program to evaluate uptake of HIV self-testing and linkages to follow-up care in a sub-Saharan African country. It is a joint collaboration between Princeton University’s Woodrow Wilson School of Public and International Affairs (WWS); ideas42, a non-profit focused on solving social problems through behavioral economics; and three reputable public health NGOs and service providers in sub-Saharan Africa. Over the course of a semester-long policy workshop, WWS Master in Public Affairs (MPA) students, with guidance and support from ideas42, completed the following analysis, supplemented by field visits to the partner sites, as well as model HIV testing and care centers in the U.S.

a. Partner Program

The partner organizations are well-respected NGOs with a national reputation for excellence and trusted brand recognition. The partners offer healthcare services through static clinics in cities and towns throughout the country, and via mobile clinics that visit rural sites every several months. Static and mobile clinics offer HTC, sexual and reproductive health (SRH) and family planning (FP) services, and other health services, including tuberculosis screenings and blood pressure tests.

In an effort to increase the number of people who know their HIV status, the partners are piloting a new self-test program. The self-tests will be free of charge, can be taken in the privacy of one’s home, and provide a client with her HIV status within 20

31 To protect privacy, names and identifying characteristics of the partner organizations have been removed from this report.
minutes of taking the test. The partners plan to deliver the kits through trained community health workers, who will go door-to-door and distribute them to qualified members of the household. Health workers will explain how to use the self-test in community forums and in homes and encourage community members to visit the mobile clinic for confirmatory testing, counseling, and other SRH services in the coming one to two weeks. There is also future funding potential to provide a two-week supply of anti-retroviral therapy (ART) to clients who are eligible to start the regimen immediately.

b. Behavioral Field Research

Prior to travel to sub-Saharan Africa, MPA students reviewed information on the history of HIV in the region, previous HIV-relevant work conducted by the partner NGOs, and the partners’ HIV self-test pilot design. Based on their contextual analysis, the team identified relevant psychologies and generated hypotheses based on behavioral principles studied in the policy workshop. Students created interview scripts and observation guides to assess the validity of the hypothesized bottlenecks.

In Africa, MPA students and ideas42 staff conducted field research at the partner sites by observing the NGOs’ current HTC delivery model, HIV self-test pilot design, and static clinic procedures. During the site visit, students toured and interviewed stakeholders at two static clinics, one in a large urban center and the other in a peri-urban community. Students also observed a mobile clinic in an urban area. At the large urban center, students observed how clients were received at the reception area, how health counselors conducted counseling sessions both pre and post HIV test, and the other SRH and testing services provided at the clinic.

Moreover, students interviewed clinic staff and clients about quality of care and their perceptions of HIV self- and clinic-based testing. They spoke with NGO staff who had conducted initial self-test diagnostics on the kit’s instructions and clients’ perceptions thereof. One student tested herself with the self-test kit for mechanics and ease of use. Students analyzed partner data concerning the success of the self-test kit administered in video-recorded sessions. At the peri-urban clinic, they learned about the planned rollout of self-test kits in rural areas, simulated client experience through a walkthrough of HTC services, and interviewed clinic staff and clients regarding health services offered.

Throughout the site visit, students observed exemplary HTC and SRH services provided by the NGO partners. Both static and mobile clinics use an integrated care model to provide testing, counseling, and other relevant health services associated with quality HIV care in one location. This care model supports maximum linkage to care between HIV testing, counseling, and treatment, as well as providing holistic FP and RH services.
Through this model, there is an automatic default for clients into receiving counseling and care unless they choose to opt-out, thereby making their access to healthcare more seamless and attrition less likely.

Partner clinic staff have also designed strategic planning for mobile outreach teams to facilitate mobile clinic visits to populations that need them. Mobile outreach teams engage with community leaders and groups to conduct social mapping and establish the best location for mobile clinics. Partners likewise perform community outreach through distribution of flyers and word-of-mouth—such as through community health workers and leaders—to publicize when the mobile clinic will visit and what services will be offered. Furthermore, students observed return “appointment cards” distributed to clients at the peri-urban clinic that staff qualitatively observed to have had an impact in the number of people who returned to the clinic for repeated testing.

In addition to traveling to Africa, students conducted domestic research with policy and healthcare experts serving American populations with high HIV prevalence.

c. Identifying Behavioral Levers

Overall, we identified two behavioral bottlenecks at which self-testing was most likely to break down: 1) take-up and proper execution of the self-test, and 2) pursuit of post-test counseling and follow-up care. The following sections describe the behavioral factors that contribute to these bottlenecks and outline proposed interventions.

5. Behavioral Perspectives

a. Maximize Take-up and Ensure Proper Execution of Self-Test

The first goal of the project was to ensure maximum uptake and correct usage of HIV self-testing kits. As discussed below, many of the chief advantages of self-testing carry with them new challenges. This section identifies these challenges.

First, while self-testing clients enjoy the flexibility to test at their convenience, they consequently face no specific moment in or deadline by which they must act. Absent a specified date and time, they may easily set aside and forget about the test kit in the face of other, seemingly more urgent matters that compete for their attention. This lack of a defined “recall window” for action poses a particularly acute problem among those whose desire to test was moderate or weak to begin with (as will often be the case among persons...
who are provided test kits through governmental or nonprofit initiatives, as opposed to those who seek them out and purchase them).

Similarly, individuals who have obtained a test kit may still lack a triggering event to spur them to the action of actually conducting the test. Without such an event – for example, a new partner or news of a pregnancy – individuals may face no particular pressure to remember to perform the test.

Our proposed interventions address these issues of users’ inattention by drawing upon prior findings of the behavioral science literature. In one seminal study, researchers concluded that university students’ lack of a defined timeframe in which to obtain tetanus booster shots led to indefinite, unintentional, postponement of the vaccination.32 Yet as the authors demonstrated, students who were prompted to make a concrete plan regarding how and when they would follow through were substantially more likely to receive the required booster vaccine. Example interventions included providing students with a map indicating the location where inoculations were given, and also asking students to select a date and time at which they would be vaccinated. The latter succeeded despite the students’ selection not being binding; rather, the act of plan-making itself spurred behavioral change.

Beyond the issue of limited attention documented above, certain other features of the self-test kit may inhibit users’ comprehension of the testing process. As researchers have demonstrated, limited human “processing power” impairs individuals’ ability to internalize new and seemingly complex information. For example, placing a temporary “cognitive load” of financial strain on low-income respondents substantially reduced their performance on problem solving tasks in the immediate aftermath.33 In the context of rural sub-Saharan Africa, in particular, reduced literacy and divided attention similarly reduce users’ ability to decipher the text-laden instructions provided in the self-test kits. The resulting confusion not only affects users’ ability to properly carry out the test, but perhaps more worryingly, jeopardizes their understanding of their diagnosis.

In addition to limited levels of attention and information processing, the absence of symptoms may compound the risk of inertia and derail the HIV self-testing process. Without the salience of pain or discomfort, individuals who feel perfectly healthy may have nothing to direct their thoughts towards getting tested. They may simply forego performing the test out of passive neglect. Others, meanwhile, may demonstrate more active decision-making and conclude that someone with HIV would not feel healthy. Their


“mental model” might assume that HIV infection would have produced symptoms, and conversely, that the absence of symptoms indicates the absence of infection.

Here, too, behavioral science provides a useful lens to understand the importance of salience and mental models. For example, an individual may continue to eat unhealthy foods like candy because he currently feels healthy, due to a lack of immediately salient consequences. Likewise, a patient with diabetes may mistakenly assume that taking 90% of her medication will provide 90% of the benefits – a reasonable intuition stemming from a flawed mental model – when in fact it would provide next to none.

Lastly, as an unfamiliar concept in sub-Saharan Africa, HIV self-testing may be viewed in a way that further frustrates roll-out efforts. Without any prior awareness of or exposure to self-testing, individuals may be unable to visualize the actual steps involved. This “psychological distance” they feel toward the process compounds the complexity and burden they might associate with it. As behavioral research has demonstrated, abstract tasks often appear more daunting than those visualized through concrete and personalized steps that feel more immediate, leaving individuals less likely to attempt the former.

b. Promote Linkage to Post-Test Counseling and Care

The project’s second goal is to build upon gains made by increased uptake of self-testing to promote linkages to post-test counseling, prevention and care services. Though knowledge of an individual’s HIV status is in and of itself powerful, health outcomes cannot be maximally improved without proper follow-up services. Post-test counseling is also critical to an individual’s mental wellbeing following diagnosis, and provides key information regarding next-steps. Additionally, the partner organizations recommend all individuals who test positive via self-test also seek confirmatory HIV testing at a mobile or static clinic.

The self-test context is unique in that it is one degree further removed from follow-up services, compared to conventional at-clinic testing. While in the latter, an individual is already on-site where post-test counseling, confirmatory testing and follow-up prevention and care are offered. In the self-test case, an additional action is required on her part to access the same services. Failure to follow through on this action may be explained by several behavioral barriers.

First, subsequent to completing the self-test, clients may simply forget to follow up for treatment at the clinic. This may be due to the inherent lag between self-test diagnosis and care, driving a wedge between the client’s intention and her action. For instance, the
need to seek follow-up care may be most salient when an individual first completes the test and learns she is HIV positive. However, if the mobile clinic will not arrive in her area until several days later, she may forget to attend and miss the opportunity to do so. This may be especially the case for mobile clinics running on an irregular or infrequent schedule, making it that much easier for individuals to forget the date of the mobile clinic’s next visit to their residential area.

Moreover, minor logistical difficulties, or the perception thereof, may prevent clients from seeking follow-up care at a mobile clinic subsequent to self-test completion. In some cases, these hassles may come in the form of acquiring additional information, for example the location or timing of the nearest clinic. Others may be more routine factors, such as the need to arrange for childcare while one will be at the clinic, transportation time and costs, or long and tedious queues at the clinic itself. It is important to note that it not merely these minor logistical nuisances, but the perception thereof – no matter how present in actual magnitude – that can prevent an individual from following through. Therefore, reducing the perception of required effort, in addition to that effort itself, may help to combat individuals’ unwillingness to seek follow-up care.

Furthermore, clients whose self-test indicates they are HIV positive may defer seeking follow-up care out of a desire to postpone a perceived unpleasant event. Specifically, individuals may avoid following up at the clinic due to the consequences or psychological discomfort they fear will result from corroborating their diagnosis via confirmatory testing. Additional fears may stem from the implications of a lifelong treatment regimen, or expectations of a negative response from others, among whom HIV may be stigmatized. This negative framing may keep individuals who have successfully completed their self-test away from follow-up services at the clinic.

Finally, as with the previous project goal, a breakdown in the chain of action may result from an incorrect understanding, or mental model, of HIV positivity, or lack of salience thereof. In the first case, despite receiving a positive diagnosis via self-testing, a client may fail to seek follow-up care at the clinic due to a misunderstanding that assumes someone needing HIV treatment would currently feel ill, rather than healthy. In the latter, absent symptoms, an individual simply might not actively consider the need to seek treatment right away, deferring for a period, if not indefinitely. These behavioral bottlenecks may stymie the attempts of the partner’s pilot initiative to promote linkages between HIV self-testing and follow-up counseling, treatment, and care.
6. Intervention Design

The following behaviorally-driven designs address the project’s two goals: increasing self-testing and strengthening post-test linkages to care. These designs are situated in following contexts:

1. **Self-Test Delivery:** The two- to ten-minute period when a community health worker distributes the self-test kit at the door of a potential program participant in a rural community. These visits occur one to two weeks before the partners’ mobile clinic is scheduled to visit the community.

2. **At-Home Experience:** The period beginning when the community health care worker departs the client’s home, lasting until the client arrives at the clinic. During this period, the client may or may not complete the self-test and take action to seek follow-up care.

3. **In-Clinic Visit:** The period spanning the time a client arrives, waits, and receives services at the mobile clinic.

   ![Diagram of intervention designs]

   **Self Test Delivery**
   - #1 Make a plan to self-test
   - #2 Make a plan to visit clinic

   **At Home Experience**
   - #3 Radio self-test demonstration
   - #4 Lottery for self-test return
   - #5 Self-test instructions redesign

   **In-Clinic Visit**
   - #6 Appointment reminder cards
   - #7 Information/entertainment during queue wait

   **a. Self-Test Delivery**

   The self-test delivery context, defined as the two- to ten-minute period when a community health worker distributes the self-test kit at the door of a potential program participant, influences both whether or not a client will take the test and if she will seek
follow-up care. We propose two plan-making interventions in this context: one addressing test-taking, and another targeting clinic follow-up.

1. Make a plan to self-test

First, we can leverage elements of the pilot design by enlisting community health workers, who will be delivering the self-tests, to engage end-users in plan-making. Health workers can increase the number of clients completing the self-test by asking them to select a date and time to take the test, example “The mobile clinic is on [date] at [time]. When do you plan to take the test?” As with the college students among whom non-binding plan-making increased tetanus vaccination rates, this design helps clients to overcome the problem of inattention, and to plan to take the test before they are distracted by other thoughts and responsibilities.

2. Make a plan to visit the mobile clinic

Similarly, community health workers can be enlisted to assist clients in planning their visit to a mobile clinic, with a view towards increasing client uptake of confirmatory testing, counseling, and follow-up care. During their door-to-door test distribution, community health workers should ask clients whether they prefer to visit the upcoming mobile clinic in the morning or afternoon. Health workers would then check off this preference on a flier containing additional information about the mobile clinic before handing it to the client, thereby creating a non-binding “appointment.” For example, the dialogue between a community health worker and a client might proceed as follows:

Community worker: “Do you prefer to visit the mobile clinic in the morning or the afternoon?”

Client: “Since I have to work in the morning, I’d prefer the afternoon.”

Community worker [checks off afternoon box and hands flier to client]: “Great! Here’s a flier with information about the clinic. Clinic staff will be expecting you in the afternoon, although if you change your mind and want to come in the morning, that’s okay too.”
As in the self-test plan-making case, this design combats inattention, helping the participant to plan when she will attend the clinic before competing thoughts distract her from doing so. Additionally, the non-binding appointment is a mechanism to increase participants’ commitment to attending the mobile clinic, as they believe that clinic staff will be expecting them during their appointment period. The flier also acts as a memory device that the client can carry with her or display in her home to remind her when and where to attend the clinic. Finally, staggering appointments between the morning and afternoon will reduce the actual and perceived hassle of waiting times at the clinic, which will make clients more likely to attend.

b. At-Home Experience

The at-home context, defined from the moment the community health worker departs until the client arrives at the clinic for HTC/SRH services, influences both whether or not a client will take the test and if she will seek follow-up care. We propose three interventions in this context: radio broadcasts demonstrating how to use the self-test, revised self-test instructions, and a self-test-return lottery.
3. Radio self-test demonstrations

The first design for the at-home context is regularly scheduled radio broadcasts that guide self-test takers through taking the self-test. The broadcast will narrate the instructions step by step in both the official country language and local language(s) multiple times a week at a specific time each day. The days of the week and time of day will be chosen by the partner NGOs, whose staff know best what would be the most culturally appropriate time and grant the greatest number of people the ability to take the test in the environment they choose. Radio announcers will go through the test in real time while listeners test along with the announcer at home. The partner organizations have also suggested broadcasting the self-test demonstration through other forms of media, including television, social media and Whatsapp-embedded video messages.

This intervention will draw attention to the self-test and thus functions as a triggering event to help participants take the test. Absent the radio announcement, the self-test kit may sit somewhere forgotten prior to the mobile clinic's arrival. The predictable timing of the demonstrations will also help listeners plan to take the self-test. Lastly, the radio demonstration reduces psychological distance to taking the test and addresses cognitive constraints surrounding use of a new device previously unfamiliar to the rural community.

4. Self-test instruction re-design

Our revisions to the self-test instructions, shown below in the final mock-up, aim to improve adherence to proper self-test administration and enhance linkages to follow-up care. These instructions are included in every self-test and are authored and published by the partner organization. Small, behaviorally-informed changes to the instructions may render them easier to read, understand, and follow.
HOW TO USE THE HIV SELF-TEST KIT

For questions about how to use this test kit or about your results, call the following toll-free number and a trained counselor will assist you:

TEST TAKES 10 MINUTES, RESULTS READY IN 20 MINUTES

Preparing the HIV Test:
1. DO NOT EAT OR DRINK FOR 15 MINUTES BEFORE TAKING TEST
2. Your test kit has 2 pouches. OPEN THE BOTTOM POUCH NONX, which has a picture of the vial (the small bottle with fluid) by tearing it open at the tear notch.
3. Open the vial cap-side up. Put the open vial into the stand.
4. OPEN THE TOP POUCH, which has a picture of the test device by tearing it open at the tear notch. Take out the test device. DO NOT TOUCH THE FLAT PAD. DO NOT EIP THE TEST DEVICE INO THE VIAL AT THIS STAGE.
5. Throw away the Desiccant (the last small pouch)

To collect the specimen:
6. Using the FLAT PAD of the test device, gently swab completely around the upper and lower gums one time around each.

To run and read the test:
7. Put the FLAT PAD all the way into the vial of fluid until it touches the bottom and LEAVE IT THERE for 20 minutes. Do not remove the flat pad during this time.
8. After 20 minutes pull the test device out of the vial and read your result. Do not wait longer than 40 minutes to read your results.

Interpreting your results:
HIV NEGATIVE:
A red "C" line with no "T" line is HIV NEGATIVE.
What to do now:
• We encourage you to seek confirmatory testing in 3 months.
  Date I will retest: (3 months from today)
• Please call this toll-free number to discuss your results with a trained counselor or to receive more information on post-test HIV services:

HIV POSITIVE:
A red "C" line and red "T" line is HIV POSITIVE. Even a very faint "T" line is positive.
What to Do Now:
• You need to have a confirmatory HIV test.
• Call the following toll-free number as soon as possible to discuss your results with a trained counselor:
• You should also visit your nearest Centre or health facility to have a confirmatory HIV test, receive counseling, and be referred to the appropriate services for HIV care, even if you do not currently feel sick.
• Decide and write down what day within the next 2 weeks you will follow up at Centre or Mobile Clinic for confirmatory testing and counseling:
  I will visit on ___ / ___ / ___

Invalid Result:
No "C" line and no "T" line is INVALID.
No "C" line and a red "T" line is also INVALID

What to do now:
The test did not work properly. You need to repeat the test with a new test kit, or visit your nearest Centre or health facility to have a repeat test. Please call this toll-free number to discuss your result, or to receive more information on repeat testing options:

Frequently Asked Questions:
• Why can you test for HIV using an oral sample? Does this mean I can get HIV through kissing?
  [Answer]
• Other questions...

GO TO NEXT PAGE
Examples of these changes include the following:  

- **Helping clients to plan when to take the test** by including the total time required for self-testing at the beginning of the instructions.

- **Making the instructions easier to follow and understand** by numbering all steps, including pictures, and using colored and bolded text to increase the saliency of key directions.

- **Prompting clients to plan and commit to post-test services** by integrating the “next-steps” section under each test result/diagnosis, providing a suggested time frame in which to seek services (ex/ “seek follow care within 2 weeks”), and including a place for clients to write the date when they plan to seek services.

Overall, these changes are designed to be optimally effective for a client who has limited attention available to understand the instructions and plan post-test action. Clients may experience inattention and cognitive constraints for many reasons specific to the self-test: they may be distracted with competing thoughts about HIV/AIDS, time constraints, and other responsibilities, as well as feel anxiety about the pending diagnosis.

Additional changes make the instructions more personalized, which increases the probability that clients will actually internalize and follow the instructions. Finally, some changes correct incorrect mental models that clients may have during self-testing, such as incorrect beliefs that they should open the self-test kit all at once, use the desiccant during self-testing, or that they do not need to seek post test services if they are diagnosed HIV positive but feel healthy.

**5. Lottery for self-test return**

During the pilot of the self-test program, the partner organizations plan to provide micro-incentives, here a few dollars in cell phone airtime, to participants who return their self-test kits after usage. Instead, we propose using a lottery to achieve the same goal – higher self-test returns rates, and therefore test completion rates – at a lower cost. For HIV positive patients, this should also increase care take up rates, since a clinic visit to return the test will also result in lower barriers for follow-up care.

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34 For a complete list of suggested changes and their behavioral rationales, please see Appendix A.
Under our proposal, each participant that returns her self-test at the mobile clinic would be entered into a lottery to win $20 in cell phone airtime. The prize can be awarded the day of the clinic visit and be sent via SMS. To enter the lottery, participants would just have to return their tests and provide their cell phone numbers.

Lotteries have been shown to be effective at enabling desired outcomes, leveraging several behavioral concepts to achieve desired effects. First, studies have shown that lotteries are effective because people generally overestimate their likelihood of winning and enter the lottery in higher rates than rationality would dictate. Individuals are also more likely to take an action with the chance of winning a high value item than if the reward were a guaranteed lower value prize.

Additionally, the lottery addresses two of the hurdles of going to the clinic that we have identified: hassle factors and the desire to put off an unpleasant event. As discussed, individuals may not want to go to the clinic because they want to avoid an array of real or perceived hassles associated with going to the clinic. Participants may also have significant negative feelings associated with going to the clinic; it could make their HIV positive status salient or remind them of loved ones that have died from HIV or other illnesses. These negative feelings can also result in patients deferring action. A lottery aims to counterbalance these negative feelings by creating a positive event associated with going to the clinic.

Finally, lotteries are significantly less expensive than micro-incentives. For example, if $2 were awarded to each participant that returned a test and 300 tests were returned (out of a total 500 participants), the total cost would be $600. In contrast, if 15 prizes of $20 were randomly allocated, the cost would be only $300. The 5% chance of winning can be increased or decreased as budget allows.

While this specific lottery is designed for the pilot, after the pilot participants will not be asked to return tests. During the broader roll-out, the partner organization may choose to use the lottery to incentivize other behavior, such as making an appointment at the clinic.


c. In-Clinic Visit

The last context is the in-clinic visit. The in-clinic context is defined as spanning the time a client arrives, waits, and receives services at the mobile clinic. The perception of the clinic visit, in addition to the actual experience, impacts whether or not program participants will seek initial follow-up services or return for subsequent appointments. We propose two interventions that address the previously identified challenges in this context: reminder cards for clinic appointments and providing entertainment and information for those in queue.

6. Appointment reminder cards

We recommend that when participants receive services at the clinic, they are given an appointment card identifying the date and time when they should return to the clinic for testing or follow-up care. Sometimes, when clients fail to return, it is a result of forgetfulness or procrastination and not a conscious decision to avoid the clinic. This might be especially true of visits that are spaced far apart, as it is difficult to keep track of dates. Reminder cards would serve as a memory device and could be distributed at mobile and static clinics. The cards would be effective because they provide a specified time frame for follow-up and are salient for clients as the cards may be carried in wallet or with money.

Distributing reminder cards to clients at mobile clinics would likely increase the rate of return visits. One of the partner organization’s peri-urban static clinics already makes use of reminder cards and, during the site visit; staff noted that the cards significantly increased the rate of follow-up visits that they observed. The cards are simple and effective in design, bearing only the logo associated with the clinic, the day and date of the appointment, and the general time, either AM or PM. The cards do not contain any personally identifying information so as to assuage privacy concerns.
7. Information/entertainment during wait time

Waiting in line is onerous under any circumstance, but especially unpleasant when the task at hand is not one that the client enjoys. Providing useful or entertaining information can mitigate some of the hassles associated with queuing or activities during wait time. This could be achieved through a variety of methods, including the following:

• Distributing pamphlets with relevant information about HIV/AIDS testing and treatment and other health issues
• Circulating magazines and newspapers for reading
• Broadcasting football matches over speakers in the area
• Playing music

The effectiveness of this design is likely to increase over time as the reputation of queues at mobile clinics changes, reducing not only the length of wait time, but also the perception thereof. By reducing the psychological burden of unoccupied queue time – even, in some cases, making the experience pleasant – the intervention could result in a greater uptake of services at the clinic.

7. Evaluation

When designing a behavioral intervention, it is important to consider ways in which the efficacy of the intervention can be tested. Impact evaluations are useful in measuring outcomes, determining areas for improvement, and demonstrating success to key stakeholders. This is particularly important in a relatively new field such as behavioral economics. While many of the interventions we propose here are rooted in methods that have already been tested, they have not necessarily been used in this specific context. Given that behavioral economics is a field rooted in unique contexts, testing allows us to understand better how particular populations in particular contexts respond to interventions. This is important because it allows us to improve a given intervention as well as strengthen the argument for behavioral design in similar contexts.

As in other fields, randomized controlled trials (RCTs) are considered the gold standard for testing in behavioral economics; wherever possible ideas42 uses RCTs to evaluate its work. In the case of the partner organizations’ pilot, because of the small planned sample size, an RCT is not possible; a small sample size would necessitate an unrealistically large effect size in order to detect any impact or risk lacking power.37

37 An RCT with clusters at the community level would yield a dangerously high minimum detectable effect size (MDES) of .71. MDES = (1.64 +0.84) √((p/((0.5)(1-0.5)(J))) + ((1-p)/((0.5)(1-0.5)(J)(C)))) where, ρ =01.5,
As a result, in this case we concur with the partner organization’s plan to conduct an observational study comparing take-up of HIV testing and care rates for participants that select the self-test and those that select provider-delivered testing. This will allow for an initial understanding of how self-test usage may impact testing and care in specific communities.

After the initial pilot we recommend that the partner organizations consider building a formal RCT into the nationwide rollout of the program. A stepped wedged randomized trial, randomizing by community, would allow for the eventual rollout of the program nationwide, while simultaneously evaluating the program. Under the stepped wedged model, the order in which communities receive the program is randomized, with a new set of communities receiving the program each time period. This allows for the creation of treatment and control groups and an evaluation of the impact of the program without halting the rollout of the program. The program can also be modified in later time periods, as lessons from the trial become clear.

Depending on the number of communities involved in the ultimate rollout, and to how many communities the partner organizations plan to roll out the program in each time period, the partner organizations may want to include several treatment groups, allowing for the comparison of different interventions. In order to identify the impact of the behavioral interventions proposed here, the partner organizations could create one treatment group with the pilot as initially planned, without the behavioral interventions. Another treatment group would get the pilot with the behavioral interventions. An RCT comparing the effects of both the self-test and the behaviorally informed self-test will help the NGOs, ideas42 and other organizations working in this field more clearly understand any benefits from using a behavioral approach when designing an HIV self-testing program.

In an ideal world, the partner organizations would create further behavioral treatment sub-groups with different combinations of the behavioral interventions. If the behavioral interventions are solely evaluated as one package, the trial could show that they have no impact, when, in reality, some of the interventions have a positive impact but are cancelled out by the negative impact of others. It may be possible to include enough communities (clusters) in the rollout to randomize into not only control and the two treatment groups identified above (behavioral and non-behavioral), but behavioral sub-

clusters(J) = 8 and participants(C) = 62. Power calculation is done at 90% significance level with power of 80%.
treatment groups with different combinations of the behavioral intervention components (lottery, radio self-test demonstration, etc.). Without knowing the total number of communities included in the rollout and how many communities the program can reach in each phase of the rollout, however, we have not been able to determine the feasibility of this approach.

It should be noted that it will be unrealistic to withhold some of the interventions from control communities. First, it will likely be impossible to withhold the radio self-test demonstration from control groups, since all communities will be able to access this intervention. The partner organizations should be able to evaluate its effectiveness, however, by including it in the second or third phase of the rollout. Furthermore, if the partner organizations find in their initial pre-pilot testing of instructions that the modified instructions are clearer, it would be unethical to provide some communities with instructions they know are less effective.

While the small sample size of the self-testing pilot limits the options for evaluating its effectiveness, an RCT may be used to evaluate not only self-testing but behaviorally-informed self-testing during the national roll-out of the program. Such a trial would contribute significantly to research in this area and should be pursued if feasible. Care should be taken to ensure that the RCT uses a sufficient sample size to detect any effect size considered important by the NGOs.

8. Conclusion

While many potential challenges surround uptake of HIV self-testing and follow-up care, our research and observations lead us to conclude that simple but powerful behavioral interventions have the potential to improve results. Our recommendations to the partner organizations include interventions that make small changes to participants’ experience in three specific contexts – the self-test delivery, at-home experience, and in-clinic visit. By slightly modifying the experiences participants have in their initial conversation with the health worker delivering the self-test, in their home as they contemplate whether to get tested and receive care, and at the clinic, we anticipate greater rates of self-testing and follow-up care in the future.

With the exception of the radio self-test demonstration, the interventions build upon practices the partner organizations are already pursuing, leveraging knowledge of how people make decisions and choose to act (or not) to increase the efficacy of these practices. The expansion of reminder cards and use of information and entertainment during queue wait times utilizes practices the partner organization has already found to be effective. In the case of the lottery, a behavioral intervention actually reduces costs.
Elsewhere, the proposed interventions routinize best practices like plan-making and reminders.

The promise of behaviorally-informed design is to simplify, rather than complicate, policy responses to difficult problems; we hope that the proposals put forth in this report will be useful to this end.
APPENDIX A: SELF TEST INSTRUCTIONS
Page 1: Design Changes

Original (Page 1)      Updated (Page 1)

**HOW TO TEST YOURSELF USING ORAQUICK HIV 1/2 TEST KIT**

*Before testing*

**NOTE:** Do not eat or drink anything for at least 15 minutes before using the HIV self-test.

If you have any questions about how to use this test kit please call the following toll-free number and a trained counselor will assist you:

You will find the following 3 items in your test kit:

- Test device
- Vial
- Stand

You will also find a desiccant which you will throw away

Desiccant

**Partner Logo**

**HOW TO USE THE HIV SELF-TEST KIT**

For questions about how to use this test kit or about your results, call the following toll-free number and a trained counselor will assist you:

**TEST TAKES 10 MINUTES, RESULTS READY IN 20 MINUTES**

**Preparing the HIV Test:**

1. DO NOT EAT OR DRINK FOR 15 MINUTES BEFORE TAKING TEST

2. Your test kit has 2 pouches, OPEN THE BOTTOM POUCH ONLY, which has a picture of the vial (the small bottle with fluid) by tearing it open at the tear notch.

3. Open the vial cap-side up. Put the open vial into the stand.

4. OPEN THE TOP POUCH, which has a picture of the test device by tearing it open at the tear notch. Take out the test device. DO NOT TOUCH THE FLAT PAD. DO NOT DIP THE TEST DEVICE INTO THE VIAL AT THIS STAGE.

5. Throw away the Desiccant (the last small pouch)

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Page 1: Design Changes

- **Insert partner organization’s logo** to leverage the partner’s brand name recognition and reputation for excellence within the country.
- **Change title to “HIV Self-Test Kit.”** The “1/2 Test” may create a mental model that the test itself is half complete and confuse the client.
- **Increase salience of hotline number** by boxing and bolding the number and “toll free”. This highlights the importance of the hotline and makes the number easy to find.
- **Indicate total time needed for test** to improve client’s ability to plan when to take the test, which increases test taking.
- **Increase use of imagery, simplify language** to improve information processing, remove technical terms (e.g. “developer fluid”) and reduce cognitive burden on clients.
- **Incorporate “Do Not Eat” and “Throw Away Desiccant”** as numbered steps with visuals to overcome inattention and help clients read and follow these instructions.
- **Eliminate “You will find the following 3 items”** section. Showing all the test kit parts opened together created a mental model that led people to open entire packet before reading the instructions and thinking that the desiccant was important (by seeing the desiccant’s picture but failing to read the instructions to throw it away).
Original (Page. 2-3)

To prepare for the HIV test

1. Your test kit contains two pouches. Open the bottom pouch which has a picture of the vial (the small bottle with fluid) by tearing it open at the tear notch. Take out the vial.

2. Open the lid of the vial by gently rocking the cap back and forth. Slide the open vial into the stand.

3. Open the top pouch which has a picture of the test device by tearing it open at the tear notch. Take out the test device, taking care not to touch the flat pad.

CAUTION: DO NOT DIP the test device into the developer fluid at this stage.

To run and read the test

5. Put the FLAT PAD all the way into the vial of fluid until it touches the bottom and LEAVE IT THERE for 20 minutes. Do not remove the flat pad during this time.

6. After 20 minutes pull the test device out of the vial and read your result. Do not wait longer than 40 minutes to read your result.

Interpreting the results:

HIV POSITIVE:
A red "C" line and red "T" line is HIV POSITIVE. Even a very faint "T" line is positive.

HIV NEGATIVE:
A red "C" line with no "T" line is HIV NEGATIVE.

INVALID:
No "C" line and no "T" line is INVALID. No "C" line and a red "T" line is also INVALID.

To collect the specimen

4. Using the FLAT PAD of the test device, gently swab completely around the upper and lower gums one time around each.

Swab the upper oral gums completely.
Swab the lower oral gums completely.

Updated (Page. 2-3)

To collect the specimen:

6. Using the FLAT PAD of the test device, gently swab completely around the upper and lower gums one time around each.

To run and read the test:

7. Put the FLAT PAD all the way into the vial of fluid until it touches the bottom and LEAVE IT THERE for 20 minutes. Do not remove the flat pad during this time.

8. After 20 minutes pull the test device out of the vial and read your result. Do not wait longer than 40 minutes to read your result.

Interpreting your results:

HIV NEGATIVE:
A red "C" line with no "T" line is HIV NEGATIVE. We encourage you to seek confirmatory testing in 3 months.

Date I will retest: (3 months from today)

Please call this toll-free number to discuss your results with a trained counselor, or to receive more information on post-test HIV services: 08080118

HIV POSITIVE:
A red "C" line and red "T" line is HIV POSITIVE. Even a very faint "T" line is positive.

What to do now:
- You need to have a confirmatory HIV test.
- Call the following toll free number as soon as possible to discuss your results with a trained counselor: 08080118
- You should also visit your nearest New Start St. Paul Health facility to have a confirmatory HIV test, receive counseling, and be referred to the appropriate services for HIV care, even if you do not currently feel sick.
- Decide and write down what day within the next 2 weeks you will follow up at New Start St. Paul Mobile Clinic for confirmatory testing and counseling.

I will visit on ______/______/______

GO TO NEXT PAGE
**Updated (Page. 2-3)**

**Page 2: Design Change**
- **Change "To collect the specimen" picture.** The updated model is positioned at a more extreme angle to the camera to show that the test device goes between the gums and teeth (vs. around the lips or in the mouth).

**Page 3: Design Changes**
- **Combine** "Interpreting Your Results" and "What to do after you have completed the HIV self-test," and separate the diagnosis sections with boxes. This defaults clients into seeing personalized follow up steps immediately after their diagnosis.
- **Incorporate image of hotline counselor.** This reduces abstractness of the hotline number and increases sense of clients’ perception of familiarity, which should increase use of the hotline.
- **Provide explicit emphasis** on need for care, regardless of (lack of) symptoms to address incorrect mental model that feeling healthy means one does not need to seek treatment.
- **Include planning section** under results to induce user to visualize, plan and commit to follow-up care.
• **Replace follow up period** from “as soon as possible” to specific period (e.g. 2 weeks). This enhances moment of action by providing clients with a perceived “deadline” and combats desire to indefinitely defer seeking follow-up care.

• **Increase saliency** of “Go to next page” by increasing font size, bolding, and adding a red arrow.

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**Page 4: Design Changes**

**What to do after you have completed the HIV self-test**

**If the result of your HIV self-test is positive:**
You need to have a confirmatory HIV test. Call the following toll free number as soon as possible to discuss your results with a trained counselor.

You may also visit your nearest Centre or health facility to have a confirmatory HIV test, receive counseling, and be referred to the appropriate services for HIV care.

**If the result of your HIV self-test is negative:**
We encourage you to seek confirmatory testing in 3 months. For men, we also encourage you to seek male circumcision services. Male circumcision has been shown to reduce the risk of acquiring HIV infection.

Please call this toll-free number to discuss your results with a trained counselor, or to receive more information on post-test HIV services.

**If the result of your HIV self-test is invalid:**
The test did not work properly. You need to repeat the test with a new test kit, or visit your nearest Centre or health facility to have a repeat test. Please call this toll free number to discuss your results, or to receive more information on repeat testing options.

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**INVALID RESULT:**
No “C” line and no “T” line is INVALID.
No “C” line and a red “T” line is also INVALID.

**What to do now:**
The test did not work properly. You need to repeat the test with a new test kit, or visit your nearest Centre or health facility to have a repeat test. Please call this toll free number to discuss your results, or to receive more information on repeat testing options.

**Frequently Asked Questions:**
• Why can you test for HIV using an oral sample? Does this mean I can get HIV through kissing?
  [Answer]
• Other questions...

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**Page 4: Design Changes**

• **Incorporate “What to do after you have completed the HIV self-test”** section into the diagnosis section on page 3 (for negative and positive results) and page 4 (for invalid results)

• **Include FAQ’s section** to address common testing and diagnosis misperceptions. An oral HIV test may create the incorrect mental model that HIV can be spread orally, since clients may assume that viral traces detectable by the test could also infect others.
Bibliography


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