Theory-driven formative research to support development of a pre-exposure prophylaxis (PrEP) demand creation campaign among young women in a South-African township [version 1; peer review: awaiting peer review]

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Abstract

Background: HIV pre-exposure prophylaxis (PrEP) is highly effective and could reduce the persistent high HIV incidence among young South African women. Demand creation is needed to increase PrEP uptake of this novel prevention technology. Theoretically-grounded formative research (FR) could identify factors to include in a demand creation campaign to motivate young South African women to seek PrEP.

Methods: Thirty-four household visits with young women (aged 16–32) were conducted in a township near Cape Town using Behavior Centered Design (BCD), investigating behavior contexts, the social and family environments and psychological processes, using qualitative and interactive tools, such as forced choice dilemmas, ranking games, daily script elicitation and network- and community drawings.

Results: The FR generated findings concerning a wide variety of topic areas and identified a range of opportunities as well as challenges for the successful implementation of PrEP promotion in this population. Potential challenges were young women underestimating the consequences of acquiring HIV; taking medicine to prevent a disease (which was an unfamiliar concept) and young women having few responsibilities, making health care seeking and daily pill-taking with PrEP challenging. Potential opportunities that could be leveraged for PrEP demand creation were young women's desire for trust and emotional closeness in relationships and the limited existing roles for...
young women, which could provide room for creating new aspirational roles that would motivate young women to take PrEP.

**Conclusion:** A theory-based and context-specific approach to FR led to a broad understanding of the lives and influences on young South African women and generated a comprehensive set of opportunities for intervention.

**Keywords**
Pre-exposure prophylaxis, formative research, campaign design, HIV/AIDS prevention, behavior change, behavior-centered design
Introduction

Oral pre-exposure prophylaxis (PrEP)—the use of antiretroviral drugs to prevent HIV transmission before HIV exposure—is a major breakthrough for HIV/AIDS prevention. Young women in Sub-Saharan Africa have persistently high HIV incidence and could benefit from PrEP. Not only are they at the greatest risk for HIV-infection worldwide, with two thirds of new infections among young people, they are also less likely to benefit from other prevention methods, such as condoms, which depend on their partner’s cooperation. The WHO recommends PrEP as part of combination HIV prevention for persons at substantial risk for HIV infection, with 79 countries, including in Sub-Saharan Africa, having regulatory approval for PrEP.

However, despite its promise, there are concerns about the uptake and adherence to PrEP among healthy uninfected women. Although PrEP demonstration projects have indicated high interest in PrEP among young African women at risk for HIV, an implementation challenge has been a relatively high drop-off and moderate adherence. Therefore, additional strategies are needed to stimulate uptake and adherence to a once-daily PrEP pill among young uninfected women. To address this challenge and to identify strategies that might encourage uninfected women to take PrEP daily, a rich and contextual understanding of their lives and their motivations is needed. Here we report the results of a formative research (FR) study intended to gain such a comprehensive understanding of the potential drivers for using PrEP among young uninfected women in a township in Cape Town, South Africa.

Methods

Study background

The formative research was part of a study run by a local NGO aiming to create demand, stimulate uptake and facilitate adherence to once-daily oral PrEP among HIV-uninfected women aged 16–25 in a township in Cape Town, South Africa. The aim of the FR was to gain insight into the lives and behavior of these young women, in order to develop effective and innovative strategies for a PrEP demand creation campaign.

The FR was carried out using the framework of Behavior Centered Design (BCD), an approach to behavior change that is built on the latest insights from evolutionary and environmental psychology, marketing and neuroscience. BCD comprises both a theoretical understanding of human behavior as well as a guided process to design campaigns. The approach has been employed successfully on a range of public health behaviors.

According to BCD, behavior is determined by a set of discrete but simultaneously interacting causes both within the brain and in the environment. The brain-based determinants encompass behavior that is a) under cognitive or executive control which produces planned behavior; b) influenced via the reward system, which produces motivated behavior; and c) behavior that is under automatic or reflexive control which is responsible for habitual behavior. BCD also recognizes that most behavior occurs within ‘behavior settings’, a concept introduced by Roger Barker that acknowledges the power of the environment on human behavior and in which the physical context such as infrastructure and objects interact with (often implicit) scripts, roles and routines to orchestrate behavior. These determinants of behavior are systemically explored in BCD-based FR.

Prior to starting the fieldwork, a desk-review of relevant literature and a two-day ‘framing’ workshop with with experts from previous clinical trials on PrEP, PrEP users and community experts was conducted to identify knowledge gaps and generate starting points for themes to explore during the fieldwork.

Study setting

The FR was conducted in a fast-growing peri-urban township near Cape Town, South Africa. Starting with 400–500 inhabitants in the 1980s, the Township had grown into a densely packed community of 20,000 residents. Many residents were migrants from the rural Eastern Cape area who had come to Cape Town in search of work or educational opportunities. 55% of the population was between the ages of 20–39 years. Residents were largely unskilled laborers, domestic workers, and security guards. Unemployment was 31% overall in the labor force (aged 15–64) and likely to be higher among young people. Eighty-two percent of households had a monthly income of ZAR 3,200 (equivalent to USD 220) or less. Twenty-six percent of the population was HIV-positive, and over 40% of new HIV infections were in youth under the age of 25.

Recruitment and consent

Approval to conduct the study was granted by the London School of Hygiene & Tropical Medicine (LSHTM) Ethical Committee (Ref. 9904) and the Human Research Ethics Committee of Cape Town University.

Informants were recruited and consented by staff from the local NGO that ran the study prior to the household visits. Only those who provided written consent or assent with parental consent if they were younger than 18 were recruited into the study. Informants received a ZAR 70 (approx. USD 5) gift voucher for their participation. Girls and young women of 16–25 years living in the township (i.e., the target group for the demand creation campaign) were recruited as the main informants. Participants were purposively selected to include either informants who had experience taking PrEP in the township because of their prior participation in a PrEP trial run by the same NGO (i.e., PrEP-experienced informants) or informants from the target group who had no prior experience with PrEP (i.e., PrEP-naïve participants). For the latter group, a snowball method was used throughout the first week, resulting in a sample that was familiar with the NGO. After the initial week the 2013 census was used to generate a
randomised list of households with young women within the target age range to generate a more representative sample. Besides age, gender, location and previous PrEP experience, no other formal selection criteria were applied.

In addition to these target respondents, women slightly older than the target population were visited to provide insights into the roles and transitions that lay ahead for the target population. As their responses were insightful for understanding the life history of young women in the township, their information was included in the analysis.

In addition to the female participants, key informants were visited to contextualize the experiences of the target group. These included several men to learn about the views and beliefs of the potential partners of the target group, as well as community leaders, NGO workers, teachers, nurses, social workers, a crèche owner and politicians. To gain more insight into the experience of taking PrEP, women in another township who had taken PrEP on demand for one year were also visited. The responses of the men and the key informants are not systematically presented here unless they highlight a finding.

Household interactions and study tools
Data collection took place during household visits by two teams consisting of a researcher from LSHTM and an NGO worker. Visits lasted 2–3 hours. Demographic and household data was collected, as well as information concerning individuals, their life histories and daily routines. Household visits also included visual inspection of the surroundings and the respondent’s possessions.

Because of its focus on behavior in ‘real-time’, BCD FR relies on a flexible and iterative protocol that evolves to explore new insights that emerge during the research. From an initial set of FR tools the protocol was developed and adapted during the fieldwork to stay as ‘close to the information’ as possible, an approach known as sequential recycling in consumer research\(^1\). A rolling array of tools was employed, some of which were used throughout the FR, some which were adapted or discarded once they no longer produced new insights, and others which were added to accommodate new themes that emerged during the FR process. As a result, sample sizes for each tool varied. Varying tools according to the participants’ levels of interest helped keep respondents engaged. Further, by letting the results guide the process, new areas of interest were discovered that might have been missed using a more prescriptive protocol.

The tools were designed to be as interactive as possible, with respondents engaging in activities or producing outputs (e.g., drawings, rankings) that could be recorded and stored and then analyzed. Besides a standard set of BCD tools that focus on daily behavior such as scripting (to explore daily task sequences), community maps (to understand where in the township specific behaviors tend to happen), and motive prompts (such as the ‘Superpowers Game’ and the ‘Motive Mapping’ Exercise), new tools were developed to address issues of interest, such as forced choice games, or adapted, such as the descriptive and sanctionable norm exercises (e.g., the ‘Facebook Exercise’). Others were based on standard market research techniques, such as Attribute Ranking, (e.g., the ‘Ideal Partner’ exercise). Table 1 gives a brief overview of the purpose, methods and sample for each tool that was used in the FR. More detailed descriptions of the tools can be found at [www.lshtm.ac.uk/bcd](http://www.lshtm.ac.uk/bcd).

Analysis
Quantitative data (e.g., demographics) were entered in Excel during the field work. Qualitative information was noted by hand at the time of interview. Directly afterwards, a profile was made for every household using significant statements as well as findings generated by the specific tools. In regular brainstorm sessions during fieldwork, each team member wrote the anecdotes, patterns or associations that appeared to be significant or surprising on cards. These items were then sorted into the categories of behavioral determinants identified by BCD (as codified in a checklist format) and discussed. When there was agreement, the item became a finding. When the item was contested, it became a question for further exploration. When topic areas in the BCD checklist were underrepresented, they were marked for further investigation and new tools and methods were developed accordingly.

In a second analysis after the fieldwork, the data were combed for reoccurring themes, patterns and associations. Background and demographic information was used to determine characteristics that clustered within informants (e.g., older women tended to be heads of households), while the aggregated findings from particular tools were used to identify particular perspectives (e.g., what major fears in life a person might have). These findings were then organized according to BCD causal categories to see which changes in behavior setting, psychology or the environment could be harnessed for the campaign. The results of the second analysis are presented below.

Results
Sample characteristics
A total of 59 informants participated, of whom 27 were from the PrEP target population (girls between 16–25 years; henceforth called ‘target population’or ‘target group’), and seven were older women (26–32 years old; henceforth called ‘older respondents’).

Among the 27 target population of potential PrEP users, eight respondents were experienced in taking PrEP and 19 were PrEP-naïve. Education levels among the target respondents were relatively high, with the majority (22/27) having finished at least Grade 11. Around half had at least one child (13/27) and almost all lived with their parents or elder family members (23/27). Eleven of 27 were in some form of education (7 in high school, 4 at college or university) and three had unskilled paid employment. One of 27 respondents from the target population was HIV-positive.

The older respondents had quite different characteristics despite being only slightly older than the target group. All of
<table>
<thead>
<tr>
<th>Tool</th>
<th>Purpose</th>
<th>Method</th>
</tr>
</thead>
<tbody>
<tr>
<td>GENERAL</td>
<td></td>
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</tr>
<tr>
<td>Hopes/Dreams</td>
<td>Elicit future ambitions for themselves and their children</td>
<td>Respondents are asked to write down their ambitions for the future, both for themselves and for their children. They are then encouraged to think about how they plan to achieve these goals.</td>
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<tr>
<td>Worry Box</td>
<td>Understand worst personal fears</td>
<td>Respondents are asked to write down all their worries on post-it notes and stick them on a large piece of paper: the ‘worry box’. If they would be granted one wish to make one of their worries go away, which one would they choose? (Repeat until top 3).</td>
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<tr>
<td>Rand Windfall</td>
<td>Elicit desired consumption/savings plans</td>
<td>Respondents are given increasing sums of (play) money and asked how they would spend it.</td>
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<tr>
<td>Superpowers Game</td>
<td>Elicit relative importance of motives to an individual</td>
<td>Respondents bid sums of (play) money to obtain ‘powers’ that enable them to reliably achieve a given motive (e.g., never being hungry, being respected by peers).</td>
</tr>
<tr>
<td>Identity</td>
<td>Elicit primary dimensions of self-description</td>
<td>Ask respondents to list important characteristics, their social relationships and types of regular activity.</td>
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<tr>
<td>Mayor of the Township</td>
<td>Elicit most pressing perceived problems in the community</td>
<td>Ask respondents to list the most pressing problems they perceive in their community. They are then asked what they would do or change if they were the Mayor.</td>
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<tr>
<td>DAILY LIFE</td>
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<tr>
<td>Daily Script</td>
<td>Understand pattern of daily activities/responsibilities, level of time pressure</td>
<td>Through ordering activity cards, participants list and discuss the activities from the previous week, as well as a day from the previous weekend.</td>
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<tr>
<td>Community Map</td>
<td>Learn association between physical places and daily activities</td>
<td>Respondents draw a map of the places they frequent and list the activities that take place there.</td>
</tr>
<tr>
<td>Belongings Inventory</td>
<td>Determine types/sources of personal belongings</td>
<td>Respondents are asked about their personal belongings during the household visit: where did they get it, what do they use it for, how long have they had it?</td>
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<tr>
<td>Photovoice</td>
<td>Respondent-oriented documentation of everyday life</td>
<td>Respondents are given a camera to document a day in their life.</td>
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<tr>
<td>SOCIAL LIFE</td>
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<tr>
<td>Social Network</td>
<td>Understand most important dyadic relationships</td>
<td>The respondent is asked draw herself and then the 5 most important persons in her life on a piece of paper, after which these persons and relationships are explored further.</td>
</tr>
<tr>
<td>Facebook Exercise</td>
<td>Understand worst social fears</td>
<td>The respondent imagines posting a picture of herself on Facebook and receiving a range of possible comments. They are then asked which comment they would be most afraid of getting, which comment they actually had, and what positive comments they would like to get.</td>
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</tbody>
</table>
| Social Norms | Understand expectations on beliefs, sanctions and moral status of a behavior | Respondents are asked to estimate what proportion of people in their village carry out certain behaviors (e.g., get drunk, have children, cheat on their partner etc.). Questions are based on 23 people.
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<tr>
<th>Tool</th>
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<th>Method</th>
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<tbody>
<tr>
<td>Sexual Life History</td>
<td>Understand history of exposure to HIV, nature of sexual relationships, reasons for break-ups</td>
<td>Open-ended questions, generated questions about past relationships and reasons for break-ups</td>
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<tr>
<td>Ideal Partner</td>
<td>Understand most important qualities in romantic partners</td>
<td>Open-ended questions, generated questions about qualities valued in potential partners and their expectations from partners</td>
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<tr>
<td>Social Influence</td>
<td>Understand participants' most important sources of social influence</td>
<td>Both open-ended and prompted parts, respondents indicate sources of influence in various situations</td>
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<tr>
<td>Love and Trust</td>
<td>Understand the definition and importance of love and trust in relationships</td>
<td>Open-ended questions, generated questions about personal views on love and trust in relationships</td>
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<tr>
<td>PrEP</td>
<td>Understand factors associated with uptake and adherence</td>
<td>Uptake: respondents go through steps needed to get PrEP, adherence: respondents detail how they would integrate PrEP into daily life</td>
</tr>
<tr>
<td>PrEP RELATED</td>
<td>Explore what additional value might be attached to taking PrEP</td>
<td>Cards with descriptions of fundamental motives for taking PrEP, respondents rank motives</td>
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<tr>
<td>HIV Dilemma</td>
<td>Elicit degree of stigmatization of HIV status</td>
<td>Respondents make choices between forced disclosure and remaining secret about HIV status</td>
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<tr>
<td>Pill Attributes</td>
<td>Explore what associations are made with pills having different characteristics</td>
<td>Respondents rank different types of pills based on characteristics</td>
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<tr>
<td>Clinic History</td>
<td>Understand factors associated with interaction with health clinics</td>
<td>Asking about past experiences and interactions with clinics</td>
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them ran independent households, *i.e.*, were not living with a parent or other older family member) and all had at least one child (range 1–5). Although not purposively selected, almost all (6/7) older participants reported being HIV-positive.

**Family life

**Household structure.** On average four people lived in a house (range 2–9). Only one respondent lived in her own house, while the rest were living with their parents, other older family members (*e.g.*, cousin) or their partners. The heads of household all had jobs, most commonly as cleaner, domestic help, security guard or as a worker in nearby factories. Although the small houses left few opportunities for privacy, most women had the house to themselves during the day because parents (or partner) were out working; siblings were in school and their children were at the crèche or with grandmother.

**Daily routines and activities.** Very little variation was seen in daily activities. After preparing oneself (and child) for school/crèche in the morning and going to school (if applicable), most of the day was spent socializing in and around the house, on social media, watching television and sleeping. Evenings were spent watching TV communally. The weekends had a different routine, with most of the target group respondents going out and drinking in the evenings at taverns or ‘street bashes’ and sleeping in during the day. Excessive drinking (cider and whiskey) and drug use (eating ragga muffins) was reported by half of the participants. Being able to go out and party was often cited as a reason for not wanting to become pregnant. ‘I don’t want baby yet, I want to have fun first’ [HH#9]. There was also a group among the target respondents who did not drink a lot and who indicated in the Facebook Exercise that they would be embarrassed if people gossiped about them being drunk.

The daily life of the young women was dominated by school, socializing, relationships and going out. Young women are expected to start their own household once they were in their late twenties.

In the daily script exercise, one-third of the sample completing this tool (9 of 27) reported not eating three meals a day and often skipping breakfast and lunch or dinner. While some respondents attributed this to not having an appetite in the morning, several mentioned that they had to skip meals of poverty (which other respondents may have been reluctant to admit).

**Responsibilities and duties.** The target group had few responsibilities and duties in the household. Shopping, cooking and cleaning was generally carried out by the female head of household. The older respondents that were in charge of their own households also reported spending little time on these household duties. Besides doing the dishes and tidying the house in the morning, running a household in the township required a relatively small time investment: most houses are small and have running water, there are shops and convenience food sellers nearby and crèches are available for childcare. This was often also reported to be big advantage of life in the township compared to life in the Eastern Cape: ‘There you have to fetch water at the river, get wood, grow your own food. A trip takes all day. I wouldn’t like that life, I’m not used to it’ [HH#9].

The mothers among the respondents had few childcare responsibilities during the day because the child would either cared for by the grandmother or be at the crèche. At the age of two and one-half years, most children were enrolled in private crèches. Despite the cost (ZAR 170 approximately USD 11 per month), mothers preferred sending their children to crèche because they considered it a safe place for their children. Ensuring that their child would become a successful and healthy person was the most desired power in the Superpowers Game and worries about the future of their child ranked high among mothers in the Worry Box exercise. Daily care and financial responsibility for the children was mostly borne by or shared with others, most often the grandmother of the child. Also, after the young women had left the parental home and started their own household, the grandmother remained heavily involved in their child’s care, often taking in and raising the older children. One respondent said that she could not get pregnant again and send her child to her mother in the Eastern Cape, because ‘My mother is already taking care of 3 babies. It is hard, she is 56’ [HH#8].

**Education and employment.** Seven target respondents were still in high school and all hoped to pass grade 12. Several girls had failed previous grades, and families made efforts to ensure that their daughters would finish high school. The respondents felt under pressure to perform well in school, with failing Grade 12 coming up repeatedly as a concern in the Worry Box Exercise. Not being able to finish school was also one of the two main concerns associated with becoming pregnant. Despite the importance given to finishing high school, there was little knowledge of any possibilities for continuing education. The majority of target respondents did not know which colleges they could go to or how to apply for a place or a bursary.

Of the 16 target respondents who were not in school or college, three currently had a job. Three of the seven older women currently had a job.

**Money and possessions.** Other than a phone, some cosmetics and their clothes, respondents had very few possessions. Most girls relied on their parents and partners to buy them things. A few of the school-girls mentioned braiding hair to generate some income (100 Rand, equivalent to USD 6) and the mothers within the target group received a small government childcare grant. However, the financial burden of childcare was mostly carried by their own (or their partner’s) mother, with the mothers of these respondents paying for the food, clothes and crèche of their grandchildren.
Respondents did not contribute to general household expenditures, with either the mother or the partner doing the household shopping.

When asked how they would spend a 5000 Rand windfall (equivalent to USD 350), the majority (10 of 13) of the target population would first spend it on clothes, followed by giving it to family members (e.g., for illness or financial needs; 5/13); for phones or tablets (3/13), savings (3/13), and leisure (3/13). Only one young mother mentioned using the money to buy things for their children, supporting the observation that the financial burden of childcare was not carried by them.

Social environment

The community. Most respondents thought favorably of the township, citing the friendliness of the people, the crime rates and the job opportunities as being better than in other townships. Nevertheless, they often reported feeling physically unsafe in the township and only feeling safe in group settings, such as school or church. "Only children are safe when they are in school" (HH#16). All respondents attributed the problems with safety and crime in the community to "tik" (metamphetamine) users and dealers. The violent events in the township which led to the ejection of drug pushers during the fieldwork were welcomed by the respondents, who said that the township had now become safer.

Some of the participants who came to the township from the Eastern Cape said that it had a bad influence on people: "They come here to look for a job, but they get distracted and start drinking and forget about finding a job. They want to do what they see other people doing" [HH#20]. Many of the respondents who were originally from the Eastern Cape had sent their children back there, because they thought that it was not a good environment in which to raise a child. "The township is not a good place to raise a child. It is not clean and there are thieves here" [HH#19]. In contrast to these parental concerns, most of the younger (target) respondents preferred living in the township over the Eastern Cape, valuing the facilities and the benefits of modern life that it offered: "If you want to eat chips right now, you can do it here" [HH#9]. Life in Eastern Cape was perceived as slow and boring by respondents from the target population: "I would not want to live there. I’m not a rural girl. The facilities are scarce, there are no streetlights there, there is only electricity in the house"[HH#12].

Interpersonal relationships and social support. Families provided the most support to respondents. More than half of the target respondents mentioned they would go to one of their parents for financial, emotional or health concerns. Siblings and other family members were also mentioned frequently as important people to confide in. Partners were not mentioned as confidants. The older women mostly mentioned other family members such as sisters or mothers-in-law.

Despite a highly social environment in the township, many respondents indicated that they did not have any true friends:

'I do not have close friends, just people I hang out with’ [HH#8]. Very few female respondents mentioned friends and when prompted, almost all mentioned having only one friend. Lack of trust was consistently cited as the reason for not having (m)any friends: 'I don’t need friends, they just gossip, you can’t trust them.’ [HH#16].

Quite a few of the female respondents reported having physical fights with other girls, mostly over boys: 'Girls steal boyfriends and fight over boys. It happens a lot here, there is a shortage of boys. Boys have 2–3 girls.' [HH#10]. If boyfriend to be caught cheating, anger would be directed at the other girl, rather than at the boyfriend: 'I would beat her, burn her' [HH#7].

Romantic relationships. Eight of the 27 target respondents were currently single. The duration of the current relationships in the target population ranged from three months to six years, and only one woman was married.

Young women reported that they were expected to have a boyfriend: ‘No girl has no boyfriend!’ [HH#4], with responses to the descriptive social norms question ‘How many girls your age around here have a boyfriend’ ranging between 95–100%. The number of reported prior relationships among the women ranged from 0 to 4. Except for three, all the mothers in the target group were no longer together with the father of their child. Most pregnancies had started very early in the relationship and the father had left before the child was born. Reasons cited included the girl’s ‘hormones’ or the partner not being sure whether the child was his. This was similar for the older respondents, where all but one was still in a relationship with and living with the father of one of her children.

All female respondents seemed to accept that their partner would cheat as an unavoidable reality. Even if they were sure that their partner was faithful to them now, all respondents believed that this could change at any time. ‘Around here no man is loyal, you can have a guy for six years and he can have a go on the side and you don’t know it’ [HH#7]. Some of the target respondents knew that their partner was seeing other women but did not break up with them because they didn’t want to let the other woman take their partner away. It seemed better to share one’s partner with others than to not have him at all. The female respondents, on the other hand, all claimed to be loyal to their boyfriends and that it was bad for a girl to cheat on her boyfriend; ‘You don’t want every man on every corner saying “I have slept with her”’ [HH#16]).

In their descriptions of previous relationships, several women also included relationships that had not been consummated, suggesting that having sexual intercourse is not a prerequisite for a relationship. Several girls reported having had sexual relationships just for the money: ‘I only slept with him to go to the salon and get clothes’ [HH#19] and relationships with a so-called ‘Minister of Transport’ and ‘Minister of Finance’ were also acknowledged by some female respondents. They talked about these past transactional relationships
as a relationship where they were in charge: ‘They don’t use me, I used them!’ [HH19]. Other target respondents however, talked badly about girls who engaged in transactional sex: ‘They are careless; they sleep with guys from Zim[babwe] or Nigeria as they have more money’ [HH#16]. In the Facebook Exercise, sleeping around for money was most frequently picked by the target respondents as the worst possible rumor they could hear about themselves (4 of 7): ‘Those girls sleep around with navy people in […] They get pregnant and have had abortions. Sleeping around is something I pray not to do whatever situation I am in.’ [HH#3]

When describing their ideal romantic partner, the top attributes for female respondents all related to emotional closeness, with ‘a man who respects me’ ranked most highly. This was followed by ‘knows how to make me happy’, ‘someone I can talk to’, ‘is very loving’, ‘is honest’, ‘is responsible’, ‘is healthy’ and ‘has good morals’. More tangible aspects such as coming from the same background, wearing nice clothes, having money, being experienced in bed and being handsome were seldomly selected in the Ideal Partner Exercise. Women reported that men mostly wanted a partner who was sexy and attractive, followed by ‘healthy’, ‘not sleeping with other men’, and ‘wanting to have children’.

Rumors and secrets. All informants mentioned that gossip and rumors are part and parcel of township life. Frequently mentioned were rumors about pregnancies, HIV status, and girls who like to party and sleep around. The tendency to gossip was also the reason why people did not confide in others: ‘These communities are small, everyone will hear about it’ [HH#7]. The Facebook Exercise gauged what would be the worst thing others could say about the respondent with common concerns being rumors that a woman is sleeping around for money or presents, being drunk, being a thief, and stealing boyfriends. Respondents did not place being labelled as HIV positive amongst the worst rumors about them. Conversely, rumors about their HIV status were frequently feared by the HIV-positive women (2/3), as well as being accused of stealing boyfriends (3/3).

Limited information was shared, even with their close friends. The type of secrets ranged from going out secretly to hiding one’s positive HIV status from one’s partner or hiding one’s pregnancy for 6 months. As the boyfriends were not supposed to come to the girl’s house unless they were married, many relationships were ‘secret’. Perhaps as a consequence, honesty was among the top-ranked characteristics in the Ideal Partner exercise, with honesty being defined as ‘telling each other everything, even bad things, to hear things directly rather than from others’ [HH#21].

Psychological life

Hopes and dreams. When asked what their hopes and dreams were or to describe their lives in five years’ time, many respondents had difficulties coming up with an answer. After prompting, the majority mentioned having a job, preferably an office job at a company or with the government. Half of the target respondents mentioned moving out of the Township. A few mentioned having their own house, living either with a friend, their baby or other family. Marriage or cohabiting with a partner were never mentioned as aspirations.

Respondents found it difficult to identify role models or examples of people they admired. TV personalities were mentioned by the target group because of their clothes and style. The older women mentioned rich and independent women. ‘She is alone, but you don’t notice it’ [HH#19] – or loving and good mothers as people they looked up to.

Pregnancy and parenthood. Attitudes and behavior with respect to pregnancy and motherhood were conflicting. The suggestion of becoming pregnant in the near future elicited strong negative reactions among the target population. While all of them reported wanting to have one or two children, they did not wish to have children until they were in their late twenties or early thirties. Having a child now was seen as interfering with finishing their education (‘I want to study and be someone; if I get pregnant, then what?’ [HH#7]) or interfering with their current carefree and fun life (as one young mother said: ‘I do not have free time, can’t go out, can’t do the things you want to do, like go out with friends. My friends are not jealous of me’ [HH#3]). Nevertheless, half of the target population respondents already had children. The mothers in this sample had their first child between ages 14 and 24. Girls within the target age range estimated that between 50 and 90% of girls their age already had a baby.

Most target respondents reported external pressure to become a mother early, ‘At 18, people think it is odd to not have a child. It shows you can get pregnant; they call you bad things if you can’t’ [HH#7]. Indeed, wanting to have children was seen as an important quality for a good girlfriend by women and men in the Ideal Partner Exercise. Many target respondents reported that their boyfriends put pressure on them to have a child now (‘Boys want babies more than girls, they don’t have to take care of it’ [HH#9]) and several respondents reported that boyfriends had tried to prevent them from taking contraception.

At the same time pregnancies were a topic of gossip: ‘Girls who get pregnant are stupid, because nowadays you can prevent it; guys always leave them after’ [HH#7]. The reactions of others were often feared: ‘They will say I’m careless, that I’m doing older people’s things’ [HH#7]. None of the informant girls reported having had an abortion, although they also estimated that 50-70% of their age-mates had had one. Posters offering abortions could be seen all over the township.

Marriage and partnership. The traditional idea that there is no boyfriend until marriage is maintained and causes elaborate games of pretense, where women sneak out to stay with boyfriends, hiding the situation from parents. Only five of
the target respondents were living with both parents, suggesting that marriage patterns in the township are rapidly diverging from the traditional model.

With one exception, none of the target respondents saw a long-term future with their current partner. The one respondent who did want to settle down with her current partner explicitly did not want to marry him. Almost all girls saw their current partners as good mates and claimed to be in love with them: ‘I’m in love with him … it feels nice. But I don’t see a future with him’ [HH#8]. Also respondents who had been together with their partner for years and already had children with them, viewed themselves as too young to start their own household with their partner; ‘He is a good father and a good boyfriend, I wouldn’t want to live with him though, I am still too young. I want to stay with my mother’ [HH#3].

**Worries and concerns for the future.** The Worry Box exercise indicated that the most common concern was the health and well-being of their parents (reported by 7 of 13), which seemed to stem from a general worry about one’s parent’s mortality and the responsibilities that would fall on their shoulders if their parents were no longer able to provide for them. Other frequently mentioned concerns by target group respondents were getting pregnant (4/13), failing school (4/13), or lack of money (4/13). Among the mothers from the target population, their child’s success, health and future (5 of the 8 mothers from the target group) was the most frequently mentioned concern as well as worries about finding a job (5/8), followed by concerns about health (4/8) and money (3/8). Pregnancy was reported to be a bigger worry than HIV; reported by 4/13 vs 1/13. However, participants realized that they were more at risk for HIV than pregnancy: ‘I’m afraid of HIV more because I am protected against pregnancy with the injection but not against HIV. I have unprotected sex often’ [HH#4]. However, the prospect of HIV was not as frightening as it once was: ‘I am not so worried because people with HIV live a long time. We are not that scared anymore’ [HH#2].

Pregnancy was expected to have a bigger impact on their lives than HIV: ‘There is treatment you can live with it, but a child is a lifetime responsibility’ [HH#31]. Thus, while they realized that they were more at risk for HIV than pregnancy, the consequences of pregnancy were considered to have a bigger impact on their lives than HIV. Several respondents also mentioned being afraid of (other) STIs, as people ‘could smell it on you when you have an STI’ [HH#8]. There was a shift in the type of worries for the older respondents with none of them worrying about their parents, instead reporting concerns about getting a job (3/4) and their (positive) HIV status (3/4).

**General motivation.** The Superpowers Game was used to assess people’s relative evaluation of the 15 fundamental human motives. Participants were given ten bills of 100-valued money each (thus worth 1,000 in total), which they could use to ‘buy’ superpowers (see Table 2). In this population Nurture (‘To ensure that my children will always be happy and...')
HIV and PrEP

PrEP-experienced respondents had been taking PrEP daily from two weeks to two months. About half of them had experienced side effects such as nausea and headaches, which had disappeared after a few days. Five of seven PrEP-experienced participants named a fixed time when they would usually take their PrEP, and used a phone alarm, a household routine, or a TV show to remind them.

All seven PrEP-experienced respondents had disclosed their PrEP use to their parents, other family members, and friends; and their PrEP bottles were stored openly. Five of seven had told their partner about their PrEP use, while two did not dare to because ‘he might say something ugly’ [HH#5]. Several had told their boyfriends that they took PrEP for other reasons: ‘I told him that PrEP protects me from getting HIV from blood from someone I’m helping. I told him: “It is not about you, it is about me”’ [HH#1]. The study nurse also mentioned that girls sometimes did not disclose to their partner, because if the partner knows the girl is taking PrEP, it will be harder to negotiate condom use.

All PrEP-experienced participants replied that they would continue taking PrEP after the study: ‘Taking a pill every day is boring, but it keeps you safe. I will continue to take PrEP, there is too much HIV around here’ [HH#2]; ‘It is easy to get HIV in Cape Town, I will take PrEP as long as I live here’ [HH#8]. However, the study nurse had doubts about whether the girls would continue taking PrEP outside of a trial. Interestingly, a common question among these trial participants was how long PrEP will stay in the body and whether they will be unprotected again after the study ends.

Among the 19 PrEP-naïve target respondents, three could explain what PrEP was for: ‘PrEP is a pill against HIV in America’ [HH#4]. After having been explained the purpose of PrEP most responded favorably. They named various reasons for taking it: ‘HIV is common here’ [HH#14]; ‘Because you might get raped’ [HH#7], or ‘You never know what your boyfriend does behind your back’ [HH#9]. However, when they realized that they would have to take the pill daily, several respondents changed their minds, being apprehensive about the need for taking a pill daily: ‘I would not want to eat it, I don’t have a boyfriend, I don’t have sex’ [HH#23]. Others indicated that they would not take a pill when they were not sick, as an informant expressed after being informed of the potential side effects of PrEP: ‘Why would you take a pill when you are healthy that can make you sick?’ [HH#34].

HIV status and testing.

Of the 21 girls in the target population that were asked about their HIV status, 19 reported they were HIV negative and had tested in the last six months, one had tested negative more than 6 months ago, and one was HIV positive. However, the testing rates and knowledge of one’s HIV status in the current sample may be atypical as the eight PrEP-experienced respondents were required to be HIV-negative and were tested regularly in order to participate in the PrEP study. Six of the seven older respondents were HIV-positive and had found out because they had to get tested during one of their pregnancies.

A considerable number of respondents with a partner in the target population (5 but not all were asked) did not know their partner’s status. They cited various reasons. Some mentioned ‘never asking or talking about it’ [HH#1] and some reported asking their partner but refusing to test. ‘He says that if I am negative then he must be’ [HH#13]; ‘clinics are for women’ [HH#8]. One participant reported not sharing her status with her partner either. They were all aware that their partner could transmit the virus: ‘Of course he can bring HIV. He parties a lot’ [HH#8]. Five respondents reported testing together with their boyfriends ‘Because you never know with boys’ [HH#16], not believing that they would actually attend testing by themselves.

Of the four partners of the HIV-positive women, one was positive, two were negative and one did not know, because he refused to get tested. All of the HIV-positive women were having unprotected sex with their partners.

Disclosure of HIV in the Township.

Three of 27 target respondents knew someone who was HIV-positive, although they did not want to disclose who it was. Given an HIV prevalence of 30% in the township [16–21], disclosure of one’s status appears to be rare. ‘HIV is something you hear about at the [the NGO] but it is not something people openly talk about’ [HH#11]. Despite not knowing people who were HIV-positive, the target group estimated that between 40 and 80% of girls their age in the Township were HIV-positive. However, according to the participants it was hard to judge ‘because you can’t tell by looking’ [HH#11]; ‘you can’t see that they are sick, they look healthy’ [HH#16].

Of the seven HIV-positive older women, three had openly disclosed their status, two had disclosed to their partner but kept it hidden from the rest of the family and one had also not disclosed it to the partner whom she was living and had children with.

Perhaps because of the lack of disclosure, people’s HIV status seemed to the subject of speculation and gossip. One
PrEP naïve respondent said that there were rumors about her status because of the frequent visits of the NGO-members to her house. However, in the Facebook Exercise, the target population did not view a positive HIV status as the worst thing that could be said about them. This was different for the HIV-positive women who had not disclosed; they all worried that others would gossip about their HIV status. ‘People gossip a lot about HIV status here; if you go to the clinic every month or they see you at the HIV room in the clinic, they know’ [HH#25].

Living with HIV. To respondents from the target population, becoming HIV-positive was not expected to have a big impact on one’s life: ‘Treatment is good, you can still live a long time’ [HH#8]; ‘There is no difference between with and without HIV, they look fine, they can do everything’ [HH#9]. When asked explicitly to describe how life with HIV would be different from life without HIV, no major impact on life was expected by the target population; they could only mention relatively small lifestyle changes such as drinking less and adjusting one’s eating habits: ‘With HIV you can’t drink a lot. I like to get drunk, but with HIV I could not drink whisky, I would drink wine. With HIV you cannot eat junk food, I would need to eat vegetables to stay healthy. There are no other differences in life with and without HIV: I can still see friends, socialize, and work. I do not have to stay hidden inside my house if I’m HIV-positive’ [HH#16].

While the HIV-positive women confirmed that life with HIV meant that they had to adjust their lifestyle with regard to their drinking and eating habits and that there were no other big changes in their life after HIV, their responses to the ‘Worry Box’ and ‘Facebook’ exercises also indicated that their status and rumors about their status were a great source of concern for them (unlike those who are HIV-negative). HIV may thus not have a visible impact on one’s life, but it can have a significant psychological impact.

People with HIV and stigma. In the Social Norms exercise, all respondents indicated that being HIV-positive was not accepted by the community. Many respondents from the target population associated HIV with being careless and sleeping around: ‘They don’t take life seriously, they go and drink and sleep with men’ [HH#19]. Some girls did not see themselves as being at risk of HIV because they did not identify with the type of people who can get HIV. As one respondent explained: ‘I’m not worried about HIV, I’m not that type of girl. One who walks down the street and has one-night stands and that kind of thing. They get drunk and smoke weed and don’t use a condom and know they will get the disease. People say ugly things about these girls. They don’t get money for it, they are free for all’ [HH#5]. At the same time most target respondents were also aware that they themselves were also at risk because of their boyfriend’s promiscuous behavior. Some reported that ‘HIV is everywhere’ and so can impact anyone (almost independently of their objectively risky practices).

Some respondents did not judge people with HIV badly, as long as they took their treatment: ‘They must accept it and take the pills, there is no difference if they accept it’ [HH#37]. Conversely, HIV-positive people who did not take their ARVs were also seen as careless ‘Those are people who go out to drink, they do not take their lives seriously. They do not care about their families and others’ [HH#19].

Medication experience and adherence. All but two of the target respondents used contraception, with injections being the favored method9, followed by implants4, ‘because pills you forget’ [HH#8]. However, the two respondents using oral contraceptives, reported that they had no trouble remembering to take it daily. All respondents were knowledgeable and assertive about their contraceptive use, knowing the brand names and side effects and knowing to ask for a different type if they were not happy with their current one. Condom use varied. Two participants reported using condoms during menses because: ‘Injections may not be 100% effective, so I might get pregnant during menstruation’ [HH6].

Most women were familiar with pill taking, as evidenced by knowing the names of brands of various painkillers, antibiotics and contraceptives. Several respondents had experience with taking a course of medicine, such as painkillers, iron tablets, anti-depressants or thyroid medicine. They reported having no trouble with adherence and took medicines as advised by the clinic.

Although knowledge and use of treatment-based medicine was common, medications for disease prevention was largely a foreign concept other than contraception. Many respondents had never heard of multivitamins and the idea of taking a pill daily when one did not have symptoms was seen as an odd idea. Medications were seen for treatment rather than prevention: ‘I don’t think so, if you are not 100% sure you are sick, why are you taking medicine?’ [HH#19]. While respondents agreed that it was a good idea to be able to prevent HIV, they were skeptical about taking a daily pill.

Motives: PrEP-related. In the Motive Mapping exercise, potential motives for taking PrEP were explored. Positive associations with PrEP were related to taking good care of yourself. This could ‘earn’ you various other motives: ‘Love’ (others love you for taking good care of yourself); ‘Justice’ (doing the right thing for yourself); ‘Affiliation’ (others like and accept you because you are taking care of yourself); or ‘Status’ (being a good role model for taking care of yourself). Especially being among the first to take PrEP was seen as having the potential to enhance one’s ‘Status’: by showing others that PrEP works, they could inspire others. The subject of being a role model also came up frequently in the interviews; ‘I would like to be an example, so my friends will copy me, especially if I’m doing the right thing’[HH#13].

‘Love’ was frequently associated with PrEP use, both positively, where others would love one more for taking
good care of yourself, and negatively, where it could mean that one cannot be trusted or did not trust her partner. Another negative association that came up frequently was Disgust, as taking the pill was expected to be unpleasant.

**Discussion**

The aim of this study was to gain a comprehensive understanding of the lives of young women in a Cape Town township in order to identify feasible, effective and innovative strategies for a PrEP demand creation campaign. Using a theory-based approach and interactive tools brought a broad range of insights important for the implementation of a PrEP campaign in this population. Next we discuss these insights and the implications they have for the campaign design.

**Insight: the township is a community in transition that is still defining its rules**

This urban township is adapting to the changes imposed by modernization. Many old routines and customs that were important to rural life and the social fabric in the Eastern Cape, no longer have a place. As a result residents are still working out how best to do things and the rules and norms of this new community are not yet clearly defined.

In the township, compared to the Eastern Cape where many respondents had lived and still had family, household duties take less time, childcare can be outsourced and traditional household structures are disappearing. This transition is having a major impact on the roles and position of young women. For example, the education of girls is highly valued—they are more educated than their mothers and their male peers—but education does not offer much advantage to their employment prospects. Likewise, girls can go out, drink and have sex, yet this behavior is also associated with the stigma of being careless and promiscuous. Life in an urban township thus allows young women to develop and emancipate themselves yet provides little opportunity for them to fully make use of these possibilities. At the same time, young women do not want to go back to traditional customs: they don’t want to get married, live with a husband or partner or have babies at the expected age. Traditional roles are no longer relevant to these young women, but have not yet been replaced by new ones, hence young women are left without a clearly defined position and roles to fulfil.

The transition in the township also has an impact on relationships; with the loss of traditional family structures, new rules and norms of a romantic partnership are being established. Life in the Township was characterised by high levels of uncertainty, with perpetual concern about money, security of oneself, loved ones and possessions.

**Implications:** It is a challenging context into which to build the responsibility of taking a pill. However, the lack of clearly defined roles, positions and expectations of women could be leveraged to create new aspirational roles that could motivate women to take PrEP. Likewise, current uncertainty about the norms and expectations for courtship, partnership and parenthood could be used to create new relationship ‘settings’ into which PrEP use can be built. An intervention should take into account the tenuousness, violence and uncertainty of everyday life in a township. However, the community also has a palpable and effective ability to organize itself and deal with perceived problems, a strength that could be tapped into.

**Insight: Young women lack duties and responsibilities**

Young women between girlhood and full womanhood are in a liminal state with few daily duties and few responsibilities. Most household duties and responsibilities are borne by their mothers, who provide the household income, run the household and take over their grandchild’s care. It is not until they can no longer do these things because of old age—a time that is often feared by their daughters—that the young women take on more responsibilities.

**Implications:** Young women who have limited responsibility for their lives seem to have a low motivation to take control over their health. Moreover, since they don’t have very much to do, young women don’t have many set routines during the day. They can wake up when they want, and do different things on different days in different orders. This provides little structural ‘backbone’ on which to insert a new pill-taking routine.

**Insight: Honesty and trust are highly valued but rare commodities in social relationships**

Both sexes were looking to relationships to provide emotional closeness, but because of the perceived lack of trust, were usually not experiencing such benefits from their relationships. Young women expressed a desire for honesty and trust in relationships and friendships. They also described the perception that others could not be trusted, leading to a culture of secrets, non-disclosure, rumors and speculation that adds yet another source of insecurity to life in the township. Because of this lack of trust, young women lacked close friends and confidants, though they have many social contacts. Infidelity from boyfriends on the other hand, was expected and—because there was considerable social pressure to have a boyfriend, infidelity was a necessary evil. Girls stayed with their partners, partly from love, partly so as not to be seen as deficient, despite the men not providing many material or practical benefits (which are mostly provided by their mothers). The necessity of having a boyfriend also created competition and animosity between girls. As such, many close relationships, rather than being a source of support, often created stress and uncertainty.

**Implications:** PrEP could be promoted as an aid to trusting relationships, where partners care for and confide in each other.

**Insight: HIV is perceived as a risk but not as scary**

Young women in the township were aware of the high prevalence of HIV in their community and that they are at risk for the disease (indeed, they overestimated it). However, the possible impact of infection on their lives did not frighten...
them enough to prevent them from having sex or into consistent condom use. The awareness that there are many people living with HIV in the community, but not knowing who they are, fuels the idea that—except for a few lifestyle changes—one can keep on living one’s life with HIV. As a result, young women underestimate the ‘invisible’ social and psychological consequences of HIV, such as not being able to disclose their status for fear of being stigmatized, constant concerns about one’s health, the consequences for the future of one’s child, and one’s employment possibilities – all factors felt by those who are HIV-positive. So those who are HIV-negative and -positive have very different conceptions about what being HIV-positive means to one’s life. Conversely, pregnancy is seen as having major consequences for one’s quality of life and consequently contraceptive use is very high among young women, suggesting that when the consequences are feared, young women will take precautions.

**Implications:** For young women in this urban township, infection with HIV does not seem to have a significant impact on life, and given their awareness of highly effective treatment, there is little incentive to take precautions to prevent infection. However, most young women reported using contraception, indicating their willingness and ability to take precautions for a condition they want to avoid. As women are already aware of their risks of infection, emphasizing the risk of acquiring HIV is less likely to motivate women than emphasizing the consequences of HIV. An emphasis on the risk is not new or surprising enough to capture attention and may contribute to ‘HIV information fatigue’. However, the psychological and social consequences are underestimated among persons without HIV. The challenge is how to make young women more aware of the ‘invisible’ consequences of a positive HIV diagnosis and the impact it can have on one’s life, yet not adding more stigma to HIV.

**Insight:** Taking pills daily for a prolonged period of time is not an existing behavior in the Township

Taking medicine to prevent disease is uncommon in the township. Contraception is mostly ‘outsourced’ to long-term solutions such as using injections or an implant; pill-use is typically short-term and symptom-based. In combination with the perceived lack of impact of HIV on one’s life, there seems little proclivity among young women to take a ‘strong medicine’ daily if one is not ill. Against expectations, potential side-effects and issues with disclosure of PrEP taking status seem less of a problem for uptake and adherence of PrEP.

**Implications:** The challenge is therefore to get young women to take a pill every day to prevent a condition they are not particularly afraid of (getting HIV). A potential advantage is that PrEP is relatively unknown in the community and therefore does not have any existing negative associations. This unfamiliarity and lack of connotations provides leeway in the framing and promotion of PrEP and the concept of taking a pill for prevention. However, the use of pills is strongly associated with treatment, and PrEP’s association with HIV may lead to misunderstandings in the community about the purpose of PrEP. Therefore, care should be taken in communication about PrEP to avoid stigma of being perceived as HIV infected due to antiretrovirals rather than for HIV prevention.

**Limitations**

Due to the methodological approach used in the FR with sequential recycling of data collections tools, sample sizes varied and were small for the individual tools. However, the main themes and insights were not identified based on the result of a single tool but on their recurrence across methods and respondents. Further, many respondents were from a study-experienced population and many were familiar with studies about sexual health through a local NGO. Finally, the findings are context-specific and therefore may be difficult to generalize to other settings.

**Conclusion**

This ethnographic and interactive formative research covered a wide variety of topic areas, ranging from the behavioral (e.g., daily routines, past experiences with medicines and contraceptives, drinking/drug-taking), to the psychological (e.g., long-term ambitions, love and relationships, sources of anxiety about urban life), to the physical (e.g., the characteristics of the pill), to the social (e.g., experiences in sexual relationships and friendships with other women).

Acquiring a broader understanding of the lives and influences of these young women uncovered a wide range of opportunities for intervention and uncovered potential pitfalls that might have been overlooked if the study had focused solely on the desired target behavior. For example, the results of the Superpowers Game suggest that it may be more effective in this population to associate PrEP use with the Nurture-motive than with the Lust-motive or Love-motive, although at first glance the latter two would have seemed the more obvious options.

In addition to these ‘new’ insights, the findings generated by this FR suggest that concerns frequently described in the literature and that were also raised during the framing workshop, may not form a significant barrier for PrEP-use in this population. These included young women not perceiving themselves to be at risk for HIV, being dependent on their boyfriends because they provide practical and financial benefits, the side-effects of PrEP, that HIV is no longer stigmatized and accepted as normal, and the challenges in storing PrEP and keeping it private. In addition, sex and female sexuality were considered to be taboo subjects that would be difficult to address in a demand creation campaign for an HIV prevention method. From the FR it appears that these concerns are not particularly relevant in this population.

Together these insights underline the importance of theory-based FR for the development of context-appropriate campaign, including for PrEP demand creation. As the present findings highlight, behavior is highly situational so relying on existing literature based on findings from other contexts or on generalized assumptions may not lead to finding the most
effective levers for change. Furthermore, using a theory-based and systematic approach such as BCD for FR will lead to a more comprehensive set of options that can be leveraged in the subsequent campaign. Since human behavior is complex and rarely the result of single determinants, FR that acknowledges this complexity is more likely to result in successful campaigns.

**Data availability**

**Underlying data**

Full qualitative transcripts of the household visits are not available for ethical reasons because even after removing directly identifiable information such as names and age participant identity may remain potentially identifiable in the small township where the data was collected, presenting a risk of deductive disclosure. Therefore, to preserve participant confidentiality, these data have not been made publicly available. Relevant excerpts of transcripts (including the transcribed results of hands-on tools that we used during the household visits, such as the community map, superpowers game and network and community drawings; i.e., the transcripts specify what the participants named or chose or drew and in what order) are available from the authors on reasonable request. Requests should be sent to the corresponding author at jessiedwh@gmail.com. Access may be granted to those wishing to use the data for research purposes.

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