

**Multiple Perspectives on Safer Conception for Women Living with HIV in Botswana:
Implications for Service Delivery**

by

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DEDICATION

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ABSTRACT

HIV-affected couples in sub-Saharan Africa continue to desire childbearing. With high repeat pregnancy rates among women living with HIV and HIV sero-discordance rates close to 50% among couples in sub-Saharan Africa, it is imperative to address the reproductive needs of women living with HIV. Low-cost safer conception (SC) methods to limit HIV transmission risks within HIV sero-discordant couples can be made available in resource-constrained settings. However, SC services are underutilized in many high HIV prevalence countries, including Botswana. In order to develop culturally appropriate programs, research is needed that identifies feasible and acceptable targets for SC interventions. Therefore, this dissertation explores issues around childbearing and pregnancy planning, perceptions of different SC methods, and the correlates of SC information, motivation, behavioral skills, and self-efficacy. The research for this dissertation was conducted in collaboration with local Botswana HIV activists, community-based organizations, and women living with HIV. In addition, the in-country research team was composed of Botswana women who collected data in the local language. Our team first conducted individual in-depth interviews with HIV healthcare providers (n=10) and women living with HIV (n=10) to develop a deeper understanding of attitudes surrounding childbearing and pregnancy planning. Interviews were qualitatively analyzed using an interpretive phenomenological approach. Providers reported it was a human right and normative for women living with HIV to have children but also expressed hesitancy about women living with HIV having children. Although providers believed pregnancies amongst women living with HIV were unplanned, women described discussing pregnancy desires with sexual partners. Participants

shared that women living with HIV anticipated stigma from providers regarding childbearing. Following that study, our team conducted eight focus group discussions with women living with HIV (n=45) to gain an in-depth understanding of their perceptions regarding different SC methods, including perceived benefits and challenges of each. These qualitative data were analyzed using an interpretive phenomenological approach. Key factors influencing method perceptions reflected issues at the individual (knowledge of methods, personal motivation to protect partners from HIV transmission, and risks), interpersonal (partner support and communication, relationship intimacy, reducing partner transmission risks, provider stigma), health systems (access and availability, cost of methods, human resource shortages), policy (Ministry of Health policies), and socio-cultural levels (cultural acceptability of methods, norms of masculinity). Although a lack of prior SC knowledge and counseling was a noted challenge to uptake, women were interested in pre-exposure prophylaxis (PrEP) and vaginal insemination techniques for SC. Finally, our team conducted cross-sectional surveys amongst women living with HIV (n=356) to identify areas to target in SC interventions. We estimated four multiple linear regression models to examine factors associated with SC information, motivation, behavioral skills, and self-efficacy. The analyses revealed that while male circumcision was a SC method that was well known (83%), and the use of ART for viral suppression was known by 64% of participants. Most other methods, including vaginal insemination, PrEP, timed unprotected intercourse, and sperm washing were known by 40% of participants or less. In addition, we found that relationship and partner factors, reproductive autonomy, elements of stigma, and provider factors affect SC information, motivation, behavioral skills, and self-efficacy. These are the first SC studies in Botswana and the results highlight factors at multiple

levels that need to be addressed to successfully offer SC in Botswana and similar contexts. Implications and future directions for this work are discussed.

CHAPTER 1

Introduction

The vast majority of the 36.9 million people living with the human immuno-deficiency virus (HIV) worldwide are in their reproductive years (UNAIDS, 2018a). Data from various sub-Saharan African countries suggests that despite HIV infection, the desire for children in couples where one or both partners is living with HIV often remains (Gutin, Namusoke, Shade, & Mirembe, 2014; Kawale, Mindry, Phoya, Jansen, & Hoffman, 2015; Keogh et al., 2012; Tesfaye, Admassu, Getachew, & Sharma, 2012; Wanyenze et al., 2011). While prevention of mother-to-child transmission (PMTCT) interventions have been very successful, safer conception (SC) interventions, which protect partners from HIV infection during conception, are underutilized. However, with appropriate interventions it is possible for women living with HIV to bear children with minimal risks to themselves and their developing fetus and neonate while also greatly reducing or eliminating the risk of transmission to HIV-negative partners (M. S. Cohen et al., 2011; MacCarthy, Laher, Nduna, Farlane, & Kaida, 2009; Rodger et al., 2016; WHO, 2010).

In sub-Saharan Africa where sero-discordance rates are reported to be close to 50% (Eyawo et al., 2010), many new HIV infections occur in long-term sero-discordant relationships (Dunkle et al., 2008; Matovu, 2010). Intended conception likely contributes to some of these incident cases of HIV (Beyeza-Kashesya et al., 2010, 2009; World Health Organization, 2012). In this context, acceptable and effective SC techniques that can offer opportunities to reduce the risk of horizontal transmission to partners are especially important to stemming HIV transmissions.

SC involves the use of both behavioral and pharmacologic reproductive strategies and includes methods that are conception specific, such as timed unprotected intercourse and vaginal insemination, and non-conception specific methods, such as male circumcision, viral suppression using antiretroviral therapy (ART), and pre-exposure prophylaxis (PrEP) (Auvert et al., 2005; Baeten et al., 2012; M. S. Cohen et al., 2011; Donnell et al., 2010; Gray et al., 2007; Karim et al., 2010; Mmeje, Cohen, & Cohan, 2012; Rodger et al., 2016; Vernazza, Graf, Sonnenberg-Schwan, Geit, & Meurer, 2011). Despite these various options, the benefits of SC are not being realized in many HIV-endemic countries, including Botswana.

Botswana has one of the highest HIV rates in the world with an estimated prevalence of 23% among adults aged 15-49 years (UNAIDS, 2017). Women of reproductive age comprise the largest group of people living with HIV in Botswana with 27.4% of women aged 15 to 49 years living with HIV (UNAIDS, 2017). While Botswana has exhibited strong political support to treat HIV and is already on track to reach UNAIDS 90-90-90 targets by 2020, the country has struggled to control new HIV infections (Gaolathe et al., 2017). Botswana has seen a 4% increase in new HIV infections from 2010 to 2017 and it seems plausible that some of these new infections are among reproductive-aged sero-discordant couples who desire childbearing (UNAIDS, 2018b). This highlights the need to promote SC approaches among HIV-affected couples who would like to become pregnant. Despite having high HIV treatment coverage and a healthcare system where access to primary care is not a limitation (National AIDS Coordinating Agency, 2014), Ministry of Health (MOH) policies have provided little guidance on offering SC for people living with HIV (Botswana MOH & Masa, 2016).

Botswana suffers from insufficient targeting of prevention interventions to the needs of groups at high risk for HIV and the limited generation of appropriate socio-cultural research to

inform the development of prevention interventions. Currently, no studies in Botswana have explored issues related to SC among women living with HIV and data from the region is limited (Goggin et al., 2015; Matthews et al., 2013; Ngure et al., 2014). As SC services are not yet routinely offered in Botswana, there are many areas that need exploration and assumptions that need to be challenged before interventions can be proposed.

For example, inherent in SC interventions is the idea that women living with HIV plan their pregnancies and will actively seek advice and care from healthcare providers when they desire childbearing. However, these assumptions may not be correct in HIV-endemic countries, such as Botswana. There may be many reasons why women living with HIV would not seek SC services including a lack of pregnancy planning, stigma, or limited knowledge of SC. Research suggests that the concept of planned pregnancies may not be relevant for some women in strongly patrilineal cultures, such as many in Africa (Schaan, Taylor, Gungqisa, & Marlink, 2016). In addition, there is often strong community disapproval of reproduction among people living with HIV which may cause some women to avoid overt planning (Beyeza-Kashesya et al., 2009). Current research does not sufficiently consider the effect of this stigma and how this might affect fertility desires.

Evidence also suggests that women living with HIV rarely discuss their reproductive intentions with their healthcare providers due to a counseling environment that is unsupportive of childbearing for HIV-affected couples (Gourlay et al., 2014). Women living with HIV often face anticipated, perceived, and/or enacted stigma when trying to exercise their reproductive rights. It is unclear if this is happening in sexual and reproductive health services in Botswana, but pervasive stigma has been reported in Botswana for the last 10 years and found to impact HIV testing, disclosure, ART uptake, and adherence (Bene & Darkoh, 2014; Ehlers & Tshisuyi, 2015;

Kip, Ehlers, & Van Der Wal, 2009; Nam et al., 2008; Nthomang et al., 2009). However, research suggests provider attitudes about childbearing vary with some respecting the reproductive rights of people living with HIV (West et al., 2016).

Women living with HIV may also not seek SC services because they are unaware such services exist. Studies suggest that women living with HIV in sub-Saharan Africa generally have low information about SC strategies, thus limiting their uptake (Kaida et al., 2014; Matthews et al., 2013; Ngure et al., 2014; Schwartz et al., 2017; Wagner et al., 2016). Understanding why women living with HIV do not often seek SC services can help to develop targeted interventions for women living with HIV as a means of fulfilling their reproductive goals and decreasing the risk of HIV transmission.

The use of SC methods may also be affected by partner dynamics. Data from various sub-Saharan African countries has highlighted the important influence of partners on fertility desires and on SC method uptake with male partners acting as both a facilitator and barrier to greater uptake (Bekker et al., 2011; Beyeza-Kashesya et al., 2010; Gutin et al., 2014; Matthews et al., 2013; Ngure et al., 2014; Schwartz et al., 2017; Wagner et al., 2016). While male involvement in SC has been low in existing SC programs (Schwartz et al., 2017), some studies have found that men report a willingness to attend clinics with female partners for SC services (West et al., 2016). Having support from one's intimate partner to use a SC method is critical and the perceived willingness of partners to use SC methods has been linked to greater motivation to use SC (Wagner et al., 2016). Teasing apart partner-related factors that can be targeted in interventions for women living with HIV and their sero-discordant male partners would likely help to improve SC method uptake.

By addressing the SC needs of women living with HIV, it may be possible to improve the overall health of women living with HIV while also reducing the spread of HIV to sero-discordant partners and infants. In order to develop culturally appropriate Botswana-specific programs, research is needed that identifies feasible and acceptable targets for SC interventions, as no SC studies have been conducted in this context. Therefore, this research seeks to explore issues around childbearing and pregnancy planning, perceptions of different SC methods, and the correlates of SC information, motivation, behavioral skills, and self-efficacy.

The Botswana Context

To have an appropriate grounding for this research, it is critical to understand the history, demographic profile, and cultural context of Botswana. Botswana is an arid, landlocked country about the size of Texas that is located in Southern Africa (see map below). The main ethnic group is the Tswana (79%, singular Motswana, plural Batswana) who speak the Setswana language. The country is predominantly Christian (79%). With a population of 2.3 million in 2016, Botswana has a relatively small population (World Health Organization, 2016) and with a median age of 23 years, the population skews fairly young (Central Intelligence Agency, 2016). When Botswana achieved independence from Great Britain in 1966, its population was predominantly rural. However, Botswana is rapidly transforming into a more urbanized country due to internal migration. In 2018, 69% of the population was residing in urban areas (United Nations Department of Economic and Social Affairs/ Population Division, 2018). Botswana has had the distinction of being one of Africa's most stable countries both politically and economically. Botswana's economic success is due mostly to the country's considerable mineral wealth (mostly diamond mining). This wealth combined with the country's relatively small

population has helped make Botswana an upper middle-income country (United Nations, Department of Economic and Social Affairs, & Population Division, 2015a). However, unemployment, especially among younger adults, is a growing problem with a 20% unemployment rate among people over 18 (Statistics Botswana, 2013).



Figure 1-1: Map of Botswana

Over the past 65 years, Botswana has experienced considerable development and economic success and has seen progress on many health and social indicators. The country has experienced huge improvements in terms of reductions in infant and child mortality, greater access to education for all, and has developed a well-functioning health system. From 1970 until about 1990, Botswana's population size was increasing due to high fertility and improvements in mortality, particularly maternal and under-five mortality. In particular, the infant mortality rate has improved from 9% in 1970 to 3.2% of babies dying before their first birthday in 2015 (United Nations, Department of Economic and Social Affairs, & Population Division, 2015b). However, starting in about 1990, the growth rate slowed and life expectancy precipitously dropped from a high of 63 years in 1990 to 49 years in 2005 (United Nations et al., 2015b).

Although life expectancy has rebounded recently (estimated at 64 years in 2015), the decline in growth rate was due to the combined effects of lower fertility and excessive death due to malaria, tuberculosis, and most notably, HIV/AIDS.

Botswana was hit particularly hard by HIV/AIDS starting in the 1990's with the first reported case of HIV in 1985 (National Council on Population and Development, Ministry of Finance and Development Planning, & UNFPA, 2010). Today, Botswana suffers from one of the highest HIV rates in the world with an estimated adult prevalence (15-49 years) of 22.8% (UNAIDS, 2017). However, Botswana has also made significant investments in health infrastructure and addressing HIV through comprehensive HIV prevention, care, and treatment (National Council on Population and Development et al., 2010). Treatment for PMTCT became available in Botswana in 1999 and there has been great success rolling out this program. Currently, about 90% of pregnant women living with HIV access antiretroviral therapy (ART) for the prevention of HIV to infants (UNAIDS, 2017).

Voluntary HIV counseling and testing centers were opened in 2000 and by 2003, 80% of the population was living within 50-kilometers of an HIV testing center (National Council on Population and Development et al., 2010). The Government of Botswana began to roll-out their national ART program in January 2002 (Wolfe et al., 2006). This service is free of charge in public sector health services and by the end of 2017, about 318,000 people living with HIV, or 84% of those in need of treatment, were accessing ART through the national ART program (UNAIDS, 2017). More women (94%) access treatment than men (72%) and between 74 to 88% of people living with HIV are virally suppressed (UNAIDS, 2017). In 2016, Botswana adopted a universal test-and-treat approach with the aim of reaching the ambitious UNAIDS 90-90-90 targets (90% HIV counseling and testing, 90% ART initiation, 90% viral load suppression)

(WHO, 2015). The country has had great success and has already reported that they are on track to reach UNAIDS 90-90-90 targets sooner than 2020, but the HIV incidence rate in the country, which has risen 4% between 2010 to 2017, indicates substantial ongoing transmissions (Gaolathe et al., 2017). The government of Botswana does not report on the number of people who are in sero-discordant or unknown status relationships. A review of the literature yielded only one study that reported on sero-discordance in Botswana with a rate of 20% in 2008 (Lingappa et al., 2008). In particular, couples who are in sero-discordant relationships would be key targets for SC interventions but estimates of this population are generally lacking.

Most of Botswana's demographic indicators show the scars of HIV. For example, from 1950 to 2015, Botswana's total fertility rate (TFR) tells the story of a country that experienced a rapid decline in fertility. The TFR is the number of children who would be born to a woman if the current age-specific fertility rates remained constant and the woman survives through her childbearing years. The drop in TFR that Botswana experienced is one of the fastest declines in all of sub-Saharan Africa (Central Intelligence Agency, 2016). The TFR has fallen from a high of 6.7 children in 1970 to 2.9 children in 2015. Botswana's TFR is expected to decrease further in the future (United Nations Department of Economic and Social Affairs/ Population Division, 2015). This rapid fertility reduction that began in the 1990's has been attributed, among other factors, to lower teenage pregnancy levels, increasing female education, greater use of modern methods of family planning, and the HIV epidemic (National Council on Population and Development et al., 2010).

Knowledge of family planning methods is high and use of modern methods of family planning has increased in Botswana over the past three decades (from 16% in 1984 to 51% in 2007) (Letamo & Navaneetham, 2015). The most commonly used methods of family planning in

Botswana are mostly short-acting methods (such as condoms, oral contraceptive pills, and injectable contraceptives) (Mayondi et al., 2016). The HIV epidemic has affected the TFR mostly through reduced fertility. First, those who are very ill are less fecund and so less likely to become pregnant. Also, greater condom usage prevents both the spread of HIV and pregnancies. In addition, starting in the 1990's, women living with HIV were discouraged from becoming pregnant due to the risks of maternal to child transmission of HIV (Mayondi et al., 2016). Discouraging pregnancy among women living with HIV was commonplace until very recently but in order to truly understand current challenges to offering SC services in Botswana, it is necessary to appreciate the structural forces that reflect the socio-cultural environment of Botswana. In particular, a discussion of gender norms, SES, and HIV stigma, is needed.

Gender Norms

Structural gender norms that encourage childbearing and view parenthood as central to male and female identity motivate a desire for pregnancies and subsequently, SC for those living with HIV because of a desire among men and women to fulfill their gendered roles (Evens et al., 2015; Nattabi, Li, Thompson, Orach, & Earnest, 2012; Schaan et al., 2016; Taylor, Mantell, Nywagi, Cishe, & Cooper, 2013; Upton & Dolan, 2011). In Botswana, childbearing is intimately intertwined with the construction of masculinity and femininity, such that womanhood or manhood is closely linked with parenthood (Schaan et al., 2016; Upton & Dolan, 2011). For women, the ability to bear children affects one's social standing as well as a personal sense of self-worth. As a result, women often feel a personal desire for children as well as social pressure to have children (Beyeza-Kashesya et al., 2010, 2009; Evens et al., 2015; Keogh et al., 2012; Upton & Dolan, 2011). For men, having children creates a sense of pride, provides an outward

sign of virility, and enhances social status (Taylor et al., 2013). In many ways, the need to be mothers and fathers and seen as full members of Tswana society puts women and men in situations where there is risk for contracting HIV through condomless sex.

Gender norms and SES

The use of SC strategies must be understood within a cultural context that takes gender relations and the complicated interplay of gender norms and SES into consideration. Girls and women are vulnerable to HIV and disproportionately affected by it because of a combination of physiological factors and gender-based inequalities, particularly in cultures that limit their access to information (WHO, 2009). In Botswana, women have a higher prevalence of HIV than men (27.4% compared to 18.4%) and become infected at younger ages than men (National AIDS Coordinating Agency, 2014; UNAIDS, 2017). In part, this is due to patriarchal ideologies that expect women to be submissive, especially in sexual interactions (Schaan et al., 2016). The resulting unequal power relations cause many young women to engage in sexual activity with older, more sexually experienced men who are more likely to be living with HIV because many women depend on men for their livelihoods (WHO, 2009).

Traditional practices such as paying a bride price, or *lobola*, further perpetuate the idea that a woman is a man's property and disempower her with regard to sexual and reproductive decision-making (Schaan et al., 2016). There is also cultural acceptance of men having multiple concurrent sexual partnerships that are seen as central to the construction of male gender identity (Stephenson, 2010). Perhaps because of these gender inequalities, almost 70% of women over age 18 in Botswana report having experienced at least one episode of sexual violence in their lifetime (Machisa & van Dorp, 2012). These culturally ingrained gender inequities in social

power emphasize male control in relationships and render many women powerless to protect themselves from increased risks for exposure to HIV because men often hold the power in relationships (Stephenson, 2010).

In many sub-Saharan African contexts, decisions surrounding childbearing may be complex given that for many poor, uneducated women, their livelihood is effectively tied to their ability to have children (Cooper, Harries, Myer, Orner, & Bracken, 2007; Nattabi et al., 2012; Schaan et al., 2016). Traditional gender norms prescribe greater autonomy to men and expect women to be financially dependent (Stephenson, 2010). In addition, lower education levels for women in patrilineal societies means that women often lack the education and ability to make decisions about their reproductive lives. In such situations, gender inequalities in SES are an important influence on fertility desires as childbearing may be one way for women to ensure that their financial needs are met (Evens et al., 2015; WHO, 2009).

In recent years, the marital status of the population of Botswana has seen major shifts, indicating significant changes in family structures in the country. National statistics suggest that the number of marriages is declining and the number of never married men and women is increasing (National Council on Population and Development et al., 2010). However, while marriage rates are decreasing, cohabitation is becoming more common. In Botswana, where womanhood and manhood is linked with parenthood, both women and men may feel the need to have children and prove their fertility in order to get married and stay married (Upton & Dolan, 2011). Therefore, despite the changes in relationship status in Botswana, abstaining from childbearing is not an option for many women and men as fertility is intricately intertwined with gender identity, cultural norms, and SES.

Gender norms and childbearing amongst people living with HIV

For women living with HIV, the need for childbearing and the inherent HIV transmission risks for partners and infants that result, come into direct conflict. Despite cultural gendered norms around the importance of parenthood, studies have reported strongly perceived HIV stigma associated with childbearing among people living with HIV and pressure on women living with HIV not to have repeat pregnancies (Beyeza-Kashesya et al., 2010, 2009; Ddumba-nyanzi, Kaawa-ma, & Johannessen, 2016; Myer, Morroni, & Cooper, 2006). This creates a conundrum for women living with HIV who wish to fulfill cultural or gender roles but feel constrained by stigma and disapproval of their reproductive desires (Upton & Dolan, 2011). In addition, research suggests having HIV may be less stigmatizing than being without children (Upton & Dolan, 2011). Individuals therefore weigh the perceived risks of HIV infection against the stigma of not having children, making SC options especially salient (Upton & Dolan, 2011). Therefore, there is stigma related to childlessness, HIV, and living with HIV and having children.

HIV stigma

Stigma was defined by Erving Goffman as “a deeply discrediting attribute” that is socially constructed and relational in that it is applied by society at the structural level through rules and sanctions that deem some to have a “spoiled identity” (Goffman, 1963). Structural and individual level stigma reinforces differences in status and can be linked to existing forms of social power that marginalizes certain groups (Deacon, 2006; Parker & Aggleton, 2003). It is then not surprising that HIV most heavily affects those who are most vulnerable in their society. It is well established that HIV disproportionately affects women and those with lower SES in

Botswana (National AIDS Coordinating Agency, 2014). Therefore, differential power relationships that marginalize certain groups and reproduce inequalities of class and gender, create and perpetuate stigma (Cuca, Onono, Bukusi, & Turan, 2012; Parker & Aggleton, 2003).

Stigma surrounding childbearing among people living with HIV can be traced to the start of the HIV epidemic when HIV was a death sentence for infants and accelerated mortality for the mother (CDC, 1985). Prior to evidence that ART could improve health, prolong life, and reduce mother-to-child transmission (MTCT), many countries discouraged childbearing among people living with HIV due to legitimate concerns about HIV transmission risks to partners and infants (CDC, 1985; Steiner, Finocchario-Kessler, & Dariotis, 2013). In the pre-ART era, the public health response was to ignore the reproductive needs of people living with HIV, a move that effectively denied that people living with HIV had reproductive rights and stigmatized their childbearing (Steiner, Finocchario-Kessler, et al., 2013). However, in recent years as ART has improved and the risk of perinatal HIV transmission has been significantly reduced, stigma surrounding childbearing has persisted despite updated policies that are supportive of pregnancy among people living with HIV (Bekker et al., 2011; WHO, 2015).

An important component of stigma is that certain groups are devalued. This differential valuing also pertains to the reproduction of the stigmatized group so that their fertility is devalued compared to other women by those with social and political power (Harris & Wolfe, 2014). This process, termed stratified reproduction, considers how social, economic, and political hierarchies based on race, ethnicity, class, and gender, structure and shape how reproduction is differentially valued (Colen, 1995). In the case of HIV, women were discouraged from childbearing and their reproduction was deemed a public health threat (Steiner, Finocchario-Kessler, et al., 2013). This history of stratified reproduction means that women living with HIV

understand that their reproduction is not equally valued by their society. To date, most studies that report on HIV stigma that is experienced during sexual and reproductive health services are qualitative in nature and survey data to test associations has been lacking.

In Botswana, pervasive stigma has been reported for the last 10 years and found to impact HIV testing, disclosure, ART uptake, and adherence (Bene & Darkoh, 2014; Ehlers & Tshisuyi, 2015; Kip et al., 2009; Nam et al., 2008; Nthomang et al., 2009). HIV-related stigma has negative health outcomes for women living with HIV, their partners, and infants. Stigma however can take many forms, including internalized, anticipated, or enacted stigma, and it is not clear which types of stigma may be most prevalent in Botswana (Earnshaw & Chaudoir, 2009). Internalized HIV stigma refers to applying negative feelings and beliefs about HIV to ones' self and is associated with low implementation of HIV-related behaviors (Earnshaw, Smith, Chaudoir, Amico, & Copenhaver, 2013). Anticipated HIV stigma involves the expectation of poor treatment, prejudice, or stereotyping from people in the future and is associated with the avoidance of interactions where people living with HIV expect to be mistreated because of their status (Earnshaw et al., 2013). Enacted HIV stigma involves experiencing HIV-related prejudice or discrimination and is associated with indicators of poor physical health and wellbeing (Earnshaw et al., 2013). More nuanced research that can tease apart the different stigma mechanisms that affect the use of SC methods are needed as most studies of HIV stigma experienced during sexual and reproductive health services have been small scale in nature.

Description of Safer Conception

SC encompasses a series of interventions that address HIV care, treatment, and prevention for individuals and couples (where either one of both parties is living with HIV) who

desire future childbearing (Bekker et al., 2011). SC includes the use of both behavioral and pharmacologic reproductive strategies to reduce the risk of HIV transmission to partners during conception while also supporting the reproductive rights of people living with HIV. In this way, SC is primary HIV prevention for sexual partners and secondary prevention for people living with HIV. A number of proven methods exist although the acceptability and feasibility of using methods may vary in different contexts. For example, studies have shown that ART to reduce the infectiousness of the HIV-positive partner (M. S. Cohen et al., 2011; Donnell et al., 2010; Rodger et al., 2016) and condomless sex limited to the time of peak fertility (Vernazza et al., 2011) are options that can minimize conception transmission risks. Another option is the use of pre-exposure prophylaxis (PrEP) for uninfected partners (Baeten et al., 2012; Grant et al., 2010; Karim et al., 2010). To use PrEP, uninfected partners take a daily dose of ART prophylactically in order to reduce the chance of HIV infection even if exposed. Artificial insemination, manual self-insemination (Bekker et al., 2011; Mmeje et al., 2012), and medical male circumcision for HIV uninfected male partners (Auvert et al., 2005; Gray et al., 2007) as well as sperm washing (Bujan et al., 2007; Zafer et al., 2016) may also reduce transmission. These technologies can make conception, pregnancy, and childbirth safer but they are impacted by cultural and structural barriers, including the cost and availability of such technologies to people living with HIV in resource-constrained countries (Hayford & Agadjanian, 2010; Matthews & Mukherjee, 2009).

Guiding theory: Information - Motivation - Behavioral Skills (IMB) model

The theory that has guided and helped organize this work is the Information – Motivation - Behavioral Skills (IMB) model. First set out by Fisher and Fisher in 1992, the IMB model is a meditational model that conceptualizes the psychological determinants of HIV preventive

behavior and provides a framework for understanding preventive behaviors across populations (Fisher & Fisher, 1992, 2000). Drawn from research in HIV prevention and social psychology, the model has been widely utilized for various HIV-preventive behaviors and in high HIV prevalence settings internationally (Cornman et al., 2011, 2008; Fisher, Fisher, & Shuper, 2009; Woldetsadik, Goggin, Staggs, Wanyenze, & Deborah, 2016). In addition, the model has been used to explain engagement in HIV care services (L. R. Smith et al., 2013). The IMB model asserts that information as well as motivation are fundamental prerequisites, although not usually sufficient, for changing complex behaviors and lead to behavioral skills which are critical determinants and independent of behavior change (Fisher & Fisher, 1992). To the extent that individuals are well-informed, motivated to act, and possess the behavioral skills needed to act, the IMB model suggests they will likely begin and maintain patterns of preventive behavior (Fisher & Fisher, 2000).

In this work, IMB has guided the understanding of SC method use by women living with HIV. In order to make the model as precise as possible, all constructs should contain content that is specific to a particular preventive behavior and target population (Fisher & Fisher, 1992). Therefore, HIV information should include relevant facts and functional knowledge about HIV transmission and specific preventive behaviors. Motivation refers to personal attitudes and beliefs toward a preventive behavior (personal motivation), perceived social support and prevention relevant social norms (social motivation), and perceptions of personal vulnerability for such behaviors. Motivation influences whether informed individuals will be inclined to act on the knowledge they have. Behavioral skills are an additional prerequisite to preventive behavior. This construct is composed of an individual's objective ability or skills and perceived self-

efficacy concerning performance of the behavior. This construct suggests that one needs to possess the preventive skills and have the belief that one is able to use them.

The IMB model is most useful for understanding individual, micro-level constructs but has been criticized for having limited capacity to tease out moderating and structural/societal factors that affect behavior. In the proposed model, structural and societal factors that likely moderate IMB for the use of SC methods in Botswana and help place IMB in context are listed (see Figure 1-2 below). This allows for attention to the larger systems, culture, situations, barriers, and layered frameworks in which SC is negotiated. This model also has the benefit of clearly identifying areas for intervention.

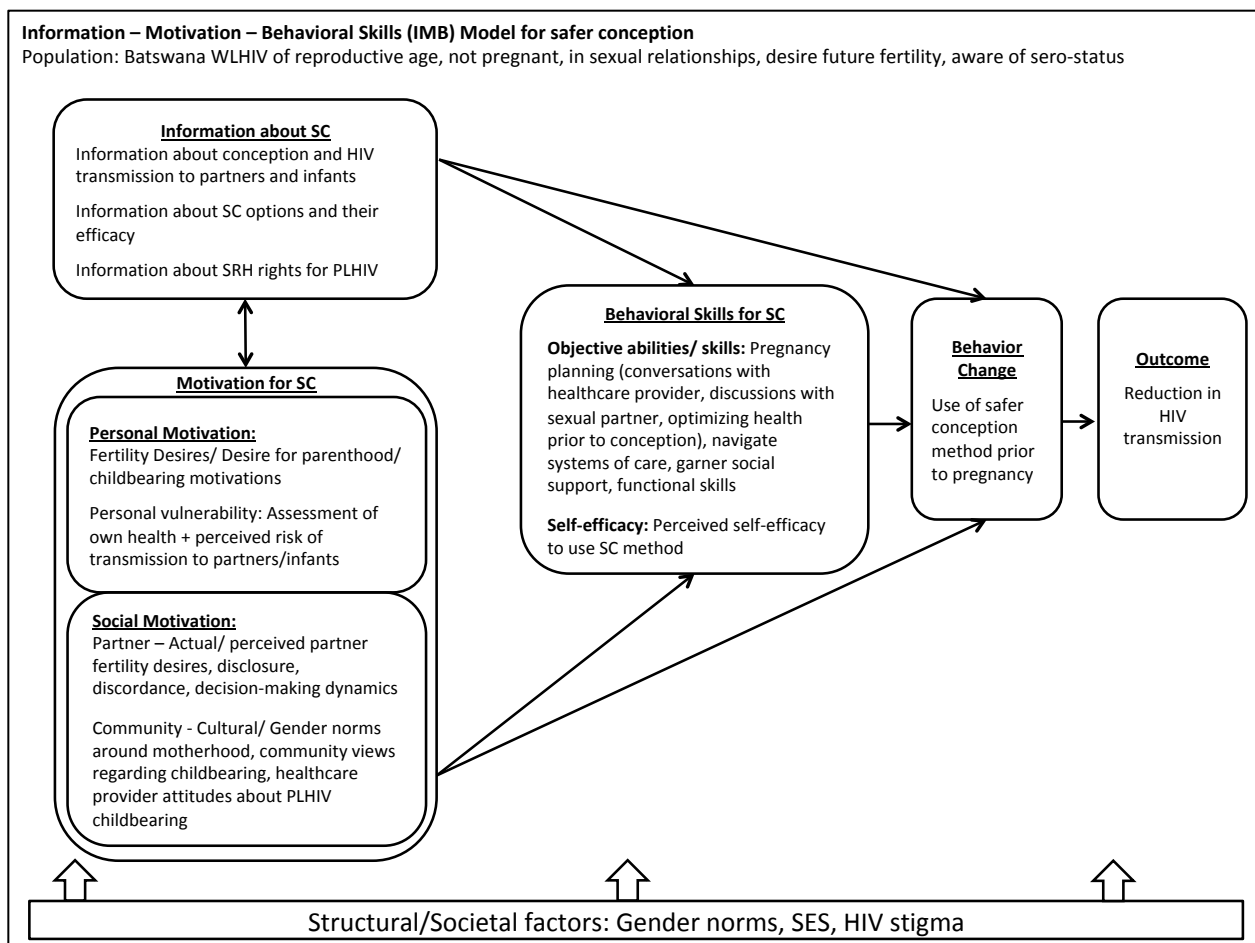


Figure 1-2: Conceptual model – IMB for Safer Conception

Information about Safer Conception

The construct of information is central to achieving behavior change but the IMB model stipulates the information needs to be directly relevant to the preventive behavior (Fisher & Fisher, 1992). As it relates to the behavior of using SC methods, women living with HIV need basic information about conception as well as HIV transmission to partners and infants, specific information about SC options and their efficacy for preventing transmission to infants and partners, and their sexual and reproductive rights as a prerequisite for use. The family planning literature also suggests that sufficient information about methods, in this case, SC methods, is a fundamental component of quality care (Bertrand, Hardee, Magnani, & Angle, 1995; Pilgrim, Cardona, Pinder, & Sonenstein, 2014).

Information About Conception and HIV Transmission to Partners and Infants

Knowledge About Conception. In order to use a SC method, women living with HIV need to have an understanding of fertility and conception. A review of the literature yielded only one study that reported on life skills/ HIV/AIDS education in schools and none that addressed comprehensive sexual education (CSE) in Botswana (Pattman & Chege, 2003). UNFPA Botswana recently noted that CSE is not integrated in primary and secondary school curricula, and is specifically targeting improved guidelines and standards for the design and implementation of community and school-based CSE programs over the coming years (UNFPA & Government of Botswana, 2017). Research has found however that open discussions about sexuality in Botswana are generally taboo and that young people may feel uncomfortable discussing such topics with parents or teachers (Pattman & Chege, 2003; UNFPA & Government of Botswana, 2017). If contraceptive prevalence is used as a proxy for knowledge about fertility

and conception, then it appears that understanding about conception is moderate since about 51% of reproductive aged women use modern methods of family planning (Mayondi et al., 2016). Also, a study among university students in Botswana found that levels of awareness about the effectiveness of contraceptives to prevent pregnancy were high (Hoque, Ntsipe, & Mokgatle-Nthabu, 2013). However, a study from Kenya looking at uptake of SC methods reported that there was limited knowledge of peak fertility in a sample of discordant couples, suggesting that the menstrual cycle may not be well understood (Ngure et al., 2017). Basic knowledge about fertility and conception may be a gap that needs to be addressed in order to facilitate optimal uptake of SC methods.

HIV Transmission to Partners. Having basic knowledge about HIV transmission is also fundamental to SC for women living with HIV. Studies in Botswana have reported various levels of basic HIV knowledge. Some studies in Botswana have reported high levels of basic HIV/AIDS knowledge as well as an understanding that HIV can be transmitted through condomless sexual intercourse (National AIDS Coordinating Agency & Central Statistics Office, 2009; Upton & Dolan, 2011). However, functional knowledge about HIV has been found to be low among Botswana young men and women (aged 15-24) with just 48% correctly able to identify ways to prevent sexual transmission of HIV and rejecting major misconceptions about HIV transmission and prevention (Statistics Botswana, 2013). Overall, young men score more poorly than young women on these indicators. Given this low level of basic knowledge, it is perhaps not surprising that reported condom use is also going down in Botswana from 90% in 2012 to 82% in 2013 (National AIDS Coordinating Agency, 2014).

HIV Transmission to Infants. For a woman living with HIV not taking ART, the chance of passing HIV to her child ranges from 13 to 42%, with late post-natal transmissions due to breastfeeding contributing at least 24% of the overall mother-to-child transmissions of HIV (Coutsoudis et al., 2004; Read, 2003). However, current PMTCT interventions have been very successful and can reduce the risk of MTCT to between 1-5% even in low income countries (De Vincenzi & The Kesho Bora Study Group, 2011; Shapiro et al., 2013). In general, information about the effectiveness of PMTCT is well known (Matthews et al., 2015), as HIV testing and PMTCT are a routine part of antenatal care (ANC) in sub-Saharan African countries, including Botswana (WHO Regional Office for Africa, 2014). The WHO recommends that all pregnant and breastfeeding women living with HIV should initiate an ART regimen and remain on it for life (this strategy is known as Option B+) (WHO, 2015). There are many benefits to lifelong treatment for all pregnant and breastfeeding women, including increased ART coverage among those needing treatment for their own health, a reduced risk of infecting a discordant partner, early protection against MTCT in future pregnancies, and fewer women living with HIV stopping and starting ART during repeat pregnancies (WHO, 2013). In this way, ART adherence is a key SC technique.

Information about Safer Conception Options and their Efficacy

SC encompasses a series of interventions that address HIV care, treatment, and prevention for individuals and couples (where either one of both parties is living with HIV) who desire future childbearing (Bekker et al., 2011). SC includes the use of both behavioral and pharmacologic reproductive strategies to reduce the risk of HIV transmission to HIV sero-discordant partners during conception. Although there are many options that can make

conception safer, research suggests that people living with HIV generally have low knowledge about SC strategies, thus limiting their uptake (Kaida et al., 2014; Matthews et al., 2013, 2015; Ngure et al., 2014; Schwartz et al., 2017, 2014; Wagner et al., 2016; West et al., 2016). Studies have shown varying levels of understanding about SC methods. A recent study in Kenya found an understanding among people living with HIV of ART-based methods, sperm washing, and self-insemination, but limited knowledge about timed intercourse (Ngure et al., 2017). However, studies in South Africa have reported some understanding of sperm washing (Schwartz et al., 2014) but low knowledge of ART adherence, PrEP, self insemination, or timed unprotected intercourse as SC options (Matthews et al., 2015; Schwartz et al., 2014). Until fairly recently, there were no quantitative measures of SC information in sub-Saharan Africa among people living with HIV (Goggin et al., 2015; Woldetsadik et al., 2016). To date, no qualitative or quantitative studies have reported on SC information in Botswana.

Non-conception specific SC Techniques. Some SC methods are effective at reducing HIV transmission risks but are not specific to only conception. For example, studies in heterosexual populations have shown that ART adherence for the primary prevention of HIV to negative partners, a concept known as treatment as prevention (TasP), can eliminate the risk of transmission to uninfected partners (M. S. Cohen et al., 2011; Donnell et al., 2010; Grant et al., 2010; Rodger et al., 2016). These studies prompted UNAIDS and other leading scientific and medical organizations to launch the Undetectable = Untransmittable (U = U) campaign in 2016 (UNAIDS, 2018c). However, to reduce the infectiousness of the HIV-positive partner, it is critical that people living with HIV are virally suppressed through a combination of access and adherence to ART (Mills, Nachega, Bangsberg, et al., 2006; Mills, Nachega, Buchan, et al.,

2006). However, the effects of ART adherence for the primary prevention of HIV to sexual partners is often not well understood by people living with HIV or HIV care providers (Matthews et al., 2013, 2014; Ngure et al., 2014; Schwartz et al., 2014). Therefore, although ART is effective at restoring health among people living with HIV (WHO, 2015), having information about these medications can be critical to using them. Studies suggest poor ART knowledge is associated with not taking ART in order to treat and prevent the spread of HIV (Gourlay, Birdthistle, Mburu, Iorpenda, & Wringe, 2013; Kip et al., 2009).

PrEP and medical male circumcision are two additional non-conception specific options for reducing the risks of HIV transmission during conception. PrEP for uninfected heterosexual partners has been shown to reduce the risk of HIV transmission to negative partners with a relative reduction of up to 73% in the incidence of HIV (Baeten et al., 2012; Thigpen et al., 2012). Again, in order to use PrEP for conception (known as “PrEPception”), adherence is of critical importance to prevent the spread of HIV. Medical male circumcision is a method that can be used by uninfected male partners to reduce HIV acquisition and has been found to decrease risk among men by 50 to 60% (Auvert et al., 2005; Gray et al., 2007). However, uptake of medical male circumcision remains low and with just 25.4% of males 15-49 being circumcised (National AIDS Coordinating Agency, 2014), Botswana is not currently meeting annual targets (National AIDS Coordinating Agency, 2013).

Conception-specific SC Techniques. While ART adherence, PrEP, and medical male circumcision are methods that are not specific to conception, sperm washing, timed unprotected intercourse, and artificial insemination are methods focused specifically on reducing conception transmission risks. Sperm washing has been found to significantly reduce the risk of HIV

transmission in discordant relationships where the male partner is living with HIV. In a recent meta-analysis, there were no cases of sero-conversion among HIV-negative women inseminated with washed semen, regardless of whether the male partner had a detectable viral load (Zafer et al., 2016). Timed unprotected intercourse requires that couples understand the menstrual cycle, the fertile period, and how to time intercourse to the peri-ovulatory window (Bekker et al., 2011). When attempting to use this approach, couples should be advised to combine this method with another strategy, such as viral suppression in the positive partner, and also be cautioned about the risks of transmission (Bekker et al., 2011). Artificial vaginal insemination may be another option to reduce the sexual transmission of HIV in couples where the woman is living with HIV and the man is not living with HIV. Artificial vaginal insemination involves collecting a semen sample in a clean container or condom, transferring the recently ejaculated semen to a syringe, and then depositing the sample into the woman's vagina during the fertile days of her menstrual cycle (Mmeje et al., 2012). Artificial vaginal insemination can be preformed at home by one's partner and is generally a low cost, low technology option.

Information about sexual and reproductive health and rights for people living with HIV

Although reproductive rights are enshrined in various UN conventions as essential human rights (International Conference on Population and Development, 1994; UN General Assembly, 1979), sexual and reproductive health guidelines in many HIV endemic countries have not been proactive in supporting people living with HIV to have children, even though fertility is highly valued. In an environment where many women living with HIV face stigma from providers (Clouse et al., 2014; Gourlay et al., 2013, 2014) and their communities (Kohler et al., 2014; Nattabi et al., 2012) with regards to childbearing, understanding one's sexual and reproductive health and rights is critical. Many countries lack formal SC guidelines, effectively ignoring the

needs and reproductive rights of women living with HIV (Mantell, Smit, & Stein, 2009). In Botswana, current guidelines assert that people living with HIV have the same reproductive rights as those who are not living with HIV and that achieving pregnancy safely should be supported, but little guidance has been offered on counseling couples to use SC techniques (Botswana MOH & Masa, 2016). The family planning literature suggests that such a lack of guidelines can act as an unnecessary barrier to quality care and services (Bertrand et al., 1995).

In a number of HIV-endemic countries in sub-Saharan Africa, it is also uncommon for providers to initiate conversations about fertility desires with people living with HIV of reproductive age (Goggin et al., 2015; Kawale et al., 2015; Matthews et al., 2015; West et al., 2016). In such a context, knowledge among people living with HIV about sexual and reproductive rights is needed but healthcare providers can also facilitate sexual and reproductive rights by destigmatizing childbearing for people living with HIV through routine initiation of fertility desire discussions (Davies, Matthews, Crankshaw, Cooper, & Schwartz, 2017; Goggin et al., 2015; Matthews et al., 2012). Ignoring the sexual and reproductive rights of people living with HIV does not mean that they will stop having children, but rather that they may risk HIV transmission when SC services are not offered (Goggin et al., 2015; Kaida et al., 2014; Mantell et al., 2009; Schwartz, Mehta, et al., 2012; West et al., 2016).

Motivation to Use Safer Conception

IMB hypothesizes that motivation influences whether informed individuals will be inclined to act on what they know. The motivation construct includes personal motivation (attitudes and beliefs) to practice a behavior, perceptions of personal vulnerability, and social motivation (the perception of social support for such acts from important others) (Fisher &

Fisher, 1992). Motivation can be influenced by factors at multiple levels including the intra- and inter-personal systems in which women living with HIV negotiate SC. Since women living with HIV are embedded within layered systems, the focus here is on factors that impact individual personal motivation including social motivation from partners and the wider community.

Personal Motivation

Personal motivation to practice SC preventive behaviors are driven by one's fertility desires or desire for parenthood. As already established, being a parent and childbearing are central to the construction of female identity in this context. Therefore, the desire to fulfill normative cultural and gender roles can drive childbearing amongst women living with HIV and thus, SC, in order to optimize the health of the mother and protect male partners and infants from HIV infection. In addition, personal motivation involves a calculation about personal vulnerability. This includes the risks to one's own health during a pregnancy as well as the risk of infecting a partner or child. The family planning literature also suggests that motivation to continue using SC methods will be affected by the quality of care that clients receive (Bertrand et al., 1995).

Fertility desires amongst women living with HIV. Fertility desires have been defined as the wish for a child in the future (Hayford & Agadjanian, 2012) and are imperative to consider in this context as they can be closely tied to the importance of parenthood. The importance of parenthood is a key aspect of SC motivation at the individual level and drives HIV risk behaviors related to conception due to the importance of childbearing for the construction of one's gender identity (Crankshaw et al., 2012; Upton & Dolan, 2011). The personal desire for childbearing

among women living with HIV in sub-Saharan Africa, where the epidemic is fueled by heterosexual contact, is well established. Data from various countries shows that many women living with HIV desire children (Beyeza-Kashesya et al., 2010; Gutin et al., 2014; Kaida et al., 2011; Kawale et al., 2015; Keogh et al., 2012; Tesfaye et al., 2012; Wanyenze et al., 2011). Women may also change their fertility preferences over time because of shifting circumstances such as their financial situation, the death of a child, their relationship status, or the desire to solidify a relationship with a new partner (Evens et al., 2015; Hayford & Agadjanian, 2012). Therefore, fertility desires are an important component of motivation to use SC methods as the use of such methods can protect partners from HIV transmission during conception and infants from HIV transmission during pregnancy, birth, and the post-partum period.

Personal vulnerability. When women living with HIV make childbearing decisions, such determinations include a calculation about personal vulnerability. This is a complex situation because not only must women living with HIV consider their own health, but also consider the risks for vertical transmission from mother to child and horizontal transmission to a negative partner. That said, many women living with HIV are aware of their HIV status when they become pregnant (Beyeza-Kashesya et al., 2010; Mayondi et al., 2016). Studies in Botswana have suggested that between 60 to 70% of women know they are living with HIV before becoming pregnant (Government of Botswana, 2011; Mayondi et al., 2016). Since many know their HIV status when they conceive, they have concerns about their health worsening as a result of carrying a child (Schaan et al., 2016). It is therefore critical to optimize pre-conception wellness among women living with HIV prior to pregnancy (Frayne et al., 2016). Improving the health status of women living with HIV before pregnancy can decrease health risks during

pregnancy, improve birth outcomes, and should be part of a holistic SC approach (Frayne et al., 2016). In addition, many women living with HIV fear they will infect a partner or infant (Carlsson-Lalloo, Rusner, & Mellgren, 2016; Cooper et al., 2007; Ngure et al., 2014; Schaan et al., 2016), making SC especially relevant because it can help reduce HIV transmission risks. It is also common for women to be blamed for infecting partners or infants, again, raising the need for, and importance of, SC in order to bear children without the personal and social stigma of spreading HIV (Upton & Dolan, 2011).

Social Motivation

In addition to personal motivation, women may feel social pressure from their partners or community to have children. It is often assumed that behaviors such as engaging in sex or childbearing are under an individual's autonomous control. However, in strongly patrilineal societies, such as many in sub-Saharan Africa, this may not be the case as these behaviors are deeply woven into social and cultural frameworks that place men and women in gendered spheres. In many sub-Saharan African contexts, decisions surrounding childbearing may be complex given that for some women, their status within a family or social structure is associated with fertility (Cooper et al., 2007; Nattabi et al., 2012). For these women, although they may wish to delay a pregnancy, childbearing may include a larger calculation that involves personal desires, the desires of one's partner, and the wider family or community (Evens et al., 2015). This creates a situation in which one's personal desires may be in conflict with expected social roles or community norms.

The role of relationship/sexual partners. Partners are a crucial influence in sexual and reproductive health/HIV care. Gendered inequalities affect heterosexual reproductive decision-making so that women are often disempowered and many studies have highlighted the important role that partners play in future fertility desires (Beyeza-Kashesya et al., 2010; Cooper et al., 2007, 2009; Gutin et al., 2014; Matthews et al., 2013; Nattabi et al., 2012). Women living with HIV with sero-negative partners who desire childbearing, as well as those who believe their partner desires childbearing, are more likely to report desired fertility (Beyeza-Kashesya et al., 2010; Gutin et al., 2014; Tesfaye et al., 2012). In this way, partner desires can impact personal motivation. In addition, male partners are at least as likely and often more likely than women to desire additional children (Cooper et al., 2009; Mantell et al., 2014; Myer, Morroni, & Rebe, 2007; Nakayiwa et al., 2006; Pollard & Saleem, 2019). Therefore, partners play a dominant role in pregnancy decisions and women's use of SC methods because of gendered power dynamics within relationships. Much of the scientific literature highlights situations where it is women who are living with HIV while their partners are not living with HIV or are of unknown HIV status. However, research on the feasibility, acceptability, and use of SC methods when the male partner is the HIV-affected partner is available from sub-Saharan African contexts (Khidir et al., 2018; Mmeje et al., 2015; Schwartz et al., 2017).

Disclosure and discordancy in relationships. Another aspect of the interpersonal partner relationship relates to whether a woman has disclosed her HIV status and whether the couple has discordant HIV statuses. The literature is mixed on the effect of disclosure with studies reporting that pregnancy and fertility desires have been associated with both partner disclosure and non-disclosure (Kaida et al., 2013; Oladapo, Daniel, & Odusoga, 2005). In addition, a recent study in

Uganda found that disclosure status was associated with greater motivation to use a SC method (Wagner et al., 2016). Discordancy however, which affects up to 50% of people living with HIV in ongoing relationships (Chemaitelly, Cremin, Shelton, Hallett, & Abu-Raddad, 2012), has been associated with increased fertility desires (Maier et al., 2009; Wagner, Linnemayr, Kityo, & Mugenyi, 2012). Since HIV acquisition and transmission to discordant partners may increase before, during, or shortly after pregnancy (Brubaker et al., 2011; Moodley, Esterhuizen, Pather, Chetty, & Ngaleka, 2009; Mugo et al., 2011), this group represents a key target for SC interventions as it may be possible to reduce new HIV infections to discordant partners.

The role of community expectations. In addition to the importance of partners, data also suggests there are strong family and community expectations to have children (Beyeza-Kashesya et al., 2010, 2009; Evens et al., 2015; Harries et al., 2007; Keogh et al., 2012) and this influences fertility desires among both men and women because they wish to fulfill their traditional societal roles (Cooper et al., 2007; Upton & Dolan, 2011). However, despite cultural gendered norms around the importance of motherhood, studies have also reported strongly perceived community disapproval associated with HIV and reproduction and community pressure on women living with HIV not to have children (Beyeza-Kashesya et al., 2010, 2009; Cooper et al., 2007; Myer et al., 2006). Women living with HIV report being insulted, gossiped about, or experiencing overt hostility in their communities with regard to childbearing (Kohler et al., 2014; Nattabi et al., 2012). This creates a conundrum for women living with HIV who wish to fulfill cultural or gender roles but feel constrained by community disapproval of their reproductive desires (Upton & Dolan, 2011). Therefore, personal and social considerations may impact childbearing motivations. In a study in Botswana, 20% of respondents were concerned about community-level

stigma (Ehlers & Tshisuyi, 2015) while another Botswana study reported that 94% of people living with HIV kept their status secret because of community-level stigma concerns (Wolfe et al., 2006).

Provider attitudes about childbearing amongst people living with HIV. Providers are embedded within communities and are not immune to wider societal norms that stigmatize childbearing amongst people living with HIV. However, research suggests provider counseling and attitudes about childbearing vary. While providers are generally understanding about pregnancies among women who find out they have HIV when already pregnant, qualitative studies have found that providers often hold negative attitudes about childbearing among women living with HIV who experience repeat pregnancies (Colvin et al., 2014; Ddumba-nyanzi et al., 2016; Goggin et al., 2014; Steiner, Dariotis, Anderson, & Finocchiaro-Kessler, 2013). Some providers encourage women living with HIV to cease childbearing (Hayford & Agadjanian, 2010; Hilliard, Gutin, & Dawson Rose, 2014; Kawale et al., 2015) even though this may not be acceptable or feasible. Women living with HIV commonly report negative and discriminatory staff attitudes with regard to childbearing (Clouse et al., 2014; Cooper et al., 2007; Gourlay et al., 2013, 2014). Such provider attitudes can exacerbate stigma and inhibit communication about fertility desires because women fear provider stigma and discrimination (Clouse et al., 2014; Goggin et al., 2015; Matthews & Mukherjee, 2009; Ong, DeHaes, Hoos, & Lammes, 1995; Steiner, Dariotis, et al., 2013). In addition, the family planning literature suggests that access to methods is impacted by psychosocial accessibility that includes the extent to which potential clients are unconstrained by psychological and social factors, such as stigma (Bertrand et al., 1995). Respectful client and staff interactions are also a key component of quality care in family

planning settings and clients concentrate on how care is delivered by healthcare providers (Pilgrim et al., 2014). If clients anticipate stigma from healthcare providers and are unsatisfied with the quality of care, this might affect whether they accept SC methods (Bertrand et al., 1995; Pilgrim et al., 2014).

Alternatively, some providers support and respect the reproductive rights of women living with HIV, appreciate the cultural gender norms that place a central importance on motherhood, and as a result do not express stigmatizing attitudes towards women living with HIV desiring children (Kawale et al., 2015; Matthews et al., 2014; Newmann et al., 2013; West et al., 2016). When this is the case, provider attitudes can promote open client-provider communication within a supportive environment. The family planning literature suggests that motivation to adopt and effectively use SC methods, satisfaction with care, and the likelihood of returning for services will be affected by the client's perception of the quality of care and their interactions with providers (Bertrand et al., 1995; Hutchinson, Do, & Agha, 2011; Pilgrim et al., 2014). For example, a Ugandan study reported that those who did not report provider hostility as a result of decisions to have children were more likely to have positive attitudes toward participation in health services (Nattabi et al., 2012). This highlights the importance of the provider-client interaction. However, providers who report a rights-based approach to childbearing amongst women living with HIV may be exhibiting social desirability bias and may not put this into practice. Therefore, patient reports of attitudes displayed by providers would be useful.

Relationship between information, motivation, and behavior change

Theoretically, information and motivation are generally seen as independent constructs in the IMB model such that there may not be a strong relationship between level of information and level of motivation (Fisher & Fisher, 1992). However, the two constructs are expected to covary (Fisher et al., 2009). For example, the information an individual has can increase or decrease motivation to perform a behavior and vice versa. In the case of information about SC options, knowledge of SC services may motivate women living with HIV to use SC services (West et al., 2016).

Behavioral skills

The IMB model theorizes that to enact most behaviors, individuals will require specific skills and objective abilities and when the behavior is difficult to implement, the individual will need high perceived self-efficacy to enact skills (Bandura, 1978, 1990; Fisher, Fisher, Amico, & Harman, 2006). IMB specifies that the effect of information and motivation on behaviors is primarily mediated through behavioral skills, particularly when the behavior is complex (Fisher et al., 2006). In this model, behavioral skills are an additional prerequisite to using a SC method (Fisher et al., 2006).

Objective Abilities and Skills

In this context, behavioral skills include a number of objective abilities and skills. One of the most important abilities is being able to take steps to prepare for or plan a pregnancy. Pregnancy planning can be seen as an ability that is associated with having certain specific skills. Although research is needed to elucidate what constitutes pregnancy planning for women living with HIV in Botswana, prior research suggests a number of areas that may be important. Some of

these skills would include talking with one's healthcare provider about fertility desires or SC strategies, discussions with one's partner about SC, and optimizing one's health prior to conception.

Pregnancy Planning. In many developed countries, the dominant ideology around childbearing suggests that pregnancies should be planned and that unplanned or unintended pregnancies are undesirable. This thinking has been applied in many developed countries where birth rates are relatively low and childbearing is seen as the product of individual decision-making (Hayford & Agadjanian, 2012). However, this assumes that individual choice is the most important factor at play and fails to recognize the complicated and inter-related social, economic, and cultural factors that constrain women's childbearing decisions. In addition, research suggests that not all fertility decisions are the result of conscious action or rational choice (Evens et al., 2015) and that the concept of planned pregnancies may not be culturally salient for some women (Evens et al., 2015; Hayford & Agadjanian, 2012; Schaan et al., 2016; Wise, 2013, 2015). For example, disadvantaged women may find it less relevant or have little reason to anticipate or delay childbearing (Barrett & Wellings, 2002). Little evidence is available from sub-Saharan African settings about whether these concepts transfer or make sense culturally (Hayford & Agadjanian, 2012). In addition, qualitative data suggests that some unintended pregnancies are still desired, even though they are not explicitly planned (Matthews et al., 2013).

In many resource-constrained settings, women's fertility behaviors do not conform to their stated preferences. For example, some women who report not desiring a pregnancy take no steps to prevent pregnancy (Harrison & O'Sullivan, 2010; Homsy et al., 2009; Mayondi et al., 2016). This gap between intention and fertility behavior may be due to structural factors that limit women's autonomy to make reproductive decisions or may also be due to ambivalence

about pregnancy. In addition, the history of HIV stigma and stratified reproduction among people living with HIV means that over time, the fertility of people living with HIV has been seen as undesirable. This differential valuing could affect the fertility desires of people living with HIV or the way people living with HIV report childbearing desires. For example, women living with HIV may be more likely to report their pregnancies as unintended because of their stigmatized identity or fears that their childbearing intentions will be criticized. Many measures of fertility desire or planning may be confounded by the knowledge among HIV-affected populations that their reproduction is not valued by their society.

Measuring pregnancy planning. Given the central importance of pregnancy planning to SC, the problems that stigma may introduce into measuring pregnancy planning, and that the concept of planning may not be salient in Botswana, it is necessary to examine the measurement of pregnancy planning in greater depth. Whether pregnancies are “planned” and how this construct is measured is a topic that has garnered much debate. It is recognized that pregnancy intentions encompass affective, cognitive, cultural, and contextual factors (J. S. Santelli, Lindberg, Orr, Finer, & Speizer, 2009). A growing number of researchers have questioned the utility of conventional measures of pregnancy intention and whether they capture the many factors affecting a woman’s pregnancy related attitudes and behaviors (J. S. Santelli et al., 2009). In sub-Saharan African contexts with high HIV prevalence and high reported rates of unintended pregnancy (Mayondi et al., 2016), the way fertility desire questions have traditionally been asked on surveys are too simplistic and one-dimensional (Hall et al., 2013; Speizer, Santelli, Afable-Munsuz, & Kendall, 2004). Current estimates of unplanned pregnancy in developing countries are often derived from one question used in the Demographic and Health Survey (DHS). The

limitations of using one question for measuring a multidimensional phenomenon has been discussed in the literature and there have been calls for the development of more nuanced measures that more deeply consider the various aspects of “planning” (Klerman, 2000; J. Santelli et al., 1999; J. S. Santelli et al., 2009; Speizer et al., 2004; Stanford, Hobbs, Jameson, DeWitt, & Fischer, 2000).

In order to provide targeted SC services that best meet the needs of women and couples in Botswana and similar contexts, a better understanding of pregnancy planning attitudes and behaviors is necessary. More deeply appreciating the aspects of pregnancy planning that are most meaningful for women will help program planners design relevant interventions that better help women living with HIV meet their fertility goals. There is high clinical and public health relevance to understanding fertility-related behaviors among women living with HIV as reducing unplanned pregnancies among women living with HIV has implications for reducing HIV transmissions among partners and infants. A more nuanced understanding of the relationship of these concepts to women’s and couples’ choices can help build strong HIV prevention programs that do not deny the desires of women living with HIV but instead recognize and support their right to have children as safely as possible.

Conversation with a healthcare provider. SC strategies require communication between people living with HIV and their healthcare providers about fertility desires, pre-conception risks, and SC options. Healthcare providers often act as a main source of health information for people living with HIV in sub-Saharan Africa (Matthews et al., 2015). Negotiating such conversations may be difficult as sub-Saharan African data suggests the client-provider relationship is highly unequal in terms of social power with providers wielding more

control, as it is presumed that providers know more than clients and because they act as gatekeepers to services (Gourlay et al., 2014; Kawale et al., 2015; Shelton, 2001). This is especially true of the client/nurse relationship which is reported as particularly disempowering (Colvin et al., 2014). These power differentials that originate at the structural level can hinder open communication (Cuca & Dawson Rose, 2015).

Since power differentials between clients and providers exist in many sub-Saharan African contexts, people living with HIV would benefit from routine provider-initiated conversations about fertility desires that place the onus for starting fertility discussions on providers (Davies et al., 2017; Goggin et al., 2015; Matthews et al., 2012). However, studies suggest providers do not routinely discuss fertility desires or initiate SC counseling with women living with HIV of reproductive age, thus reinforcing stigmatizing views that suggest women living with HIV should not have children (Goggin et al., 2015, 2014; Kawale et al., 2015; Matthews et al., 2014, 2015; West et al., 2016). As a result, communication about SC is hindered because women living with HIV do not often seek SC counseling (Goggin et al., 2014; Matthews et al., 2012). The family planning literature also suggests that if clients are unsatisfied with the quality of care, this might affect whether they return to clinics for services or follow-up (Pilgrim et al., 2014). However, despite the general lack of SC information during consultations, research has shown that women living with HIV are receptive to discussions with their providers about SC options (Kaida et al., 2014; Matthews et al., 2012, 2013, 2015; Ngure et al., 2014; West et al., 2016). This patient willingness to discuss SC with providers and learn more about SC strategies to reduce risks during conception suggests a desire for behavioral skills (Kaida et al., 2014; Matthews et al., 2015). SC counseling from a healthcare provider is essential to clients gaining the knowledge and skills to use SC methods. However, even if providers initiated SC

conversations, clients would need to feel comfortable discussing and informing providers about their fertility desires in order to receive the support and develop the skills to use SC methods.

Discussions with sexual partners. SC should ideally involve both partners in a relationship and having discussions with a sexual partner about SC is essential to using some methods. However, some studies report that specific fertility planning is rare (Kaida et al., 2014; Schaan et al., 2016) and so SC discussions among partners may be unlikely. In particular, a lack of male engagement in sexual and reproductive health services is noted repeatedly in the literature (Brittain et al., 2015; Morfaw et al., 2013; Orner, Cooper, Myer, Zweigenthal, & Bekker, 2008). However, the importance of partner communication is paramount since male partners influence women's ability and willingness to adhere to diverse products (Montgomery, Straten, & Torjesen, 2011) and good communication between partners is associated with a number of beneficial health outcomes, including high HIV disclosure and support for PMTCT programs (Reece, Hollub, Nangami, & Lane, 2010). While male involvement in SC has been low in existing SC programs (Schwartz et al., 2017), some studies have found that men report willingness to attend clinics with female partners for SC services (West et al., 2016). In particular, SC discussions among discordant partners are likely as such couples may be especially motivated to prevent HIV transmission.

Optimizing health prior to conception. Being able to optimize one's health prior to conception is another component of preparing for pregnancy. Pre-conception wellness should include a number of behaviors including taking a multivitamin that contains folic acid, tobacco avoidance, maintaining a healthy weight, treating any sexually transmitted infections, and

avoidance of medications that potentially have teratogenic effects (Frayne et al., 2016). Although some treatments should be avoided as they may be teratogenic, a key component of optimizing health for women living with HIV prior to conception is adherence to ART (Bekker et al., 2011; WHO, 2015). ART adherence also has the added bonus of being a SC method that can reduce transmission to uninfected partners.

Navigating systems of care. In many sub-Saharan African countries, including Botswana, the health system is plagued by chronic human resource shortages and staff turnover that leads to overburdened staff (Colvin et al., 2014; Gourlay et al., 2014). These shortages in turn create long wait times (Colvin et al., 2014; Hodgson et al., 2014; Kip et al., 2009) for clients as well as time constraints that lead to shorter and often low quality patient-provider interactions (Goggin et al., 2014; Harries et al., 2007; Matthews et al., 2014). In addition, clients may find it difficult to navigate the health system because verticalized systems of care, poor integration, and weak tracking systems inhibit referrals between services (Gourlay et al., 2013; Harries et al., 2007). The distance to facilities for specialized services as well as the number of visits required for certain services may also be a barrier for SC, and has been noted as a challenge to offering PMTCT services (Gourlay et al., 2013). Thus, skills for navigating health systems and locating relevant services are critical to accessing SC.

Garner social support to use a SC method. In addition to some of the other mentioned skills, women living with HIV also need social support in order to use a SC method. Support can come in many forms and from various people. Having support from one's intimate partner to use a SC method is critical and the perceived willingness of partners to use SC methods has been

linked to greater motivation to use SC (Wagner et al., 2016). Support from healthcare providers may also be very important, especially if people lack support from family members (Carlsson-Lalloo et al., 2016). While no studies conducted in sub-Saharan Africa have looked at the issue of social support as it relates to the use of SC methods, a number of studies have linked a lack of social support to poor HIV outcomes. For example, some studies have found that social support is associated with ART adherence, greater retention in care, and PMTCT uptake (Afolabi, Afolabi, Odewale, & Olowookere, 2013; Nachega et al., 2012; Underwood, Hendrickson, Van Lith, Lengwe Kunda, & Mallalieu, 2014) while a lack of social support is associated with low HIV testing, high HIV stigma, and low PMTCT uptake (Bwirire et al., 2008; Logie & Gadalla, 2009; Underwood et al., 2014). Studies that assess social support for SC method uptake are needed.

Functional skills. Uptake of a SC method will also be affected by whether a woman has the necessary functional skills. Functional skills are those that are needed to arrange and attend care visits (Amico, 2011). These skills can include preparing to be able to attend care visits including coordinating work schedules or finding childcare and finding or using transport to reach appointments. The use of some methods will require arranging or securing resources for transport to health centers. A lack of transport or funds for transport to health services is a huge challenge and is often cited as a barrier to receiving care (Kip et al., 2009). Since most SC methods also require the commitment of a partner, coordinating care around a partner's work schedule or securing childcare while accessing services is also critical (Crankshaw, Mindry, Munthre, Letsoalo, & Maharaj, 2014).

Self-efficacy to Use SC Methods

Self-efficacy is the belief or confidence in one's ability to perform behaviors that bring about a desired outcome (Bandura, 1978). In order to use a SC method, women living with HIV need self-efficacy to achieve a number of tasks including but not limited to negotiating with partners, speaking with providers, optimizing their health before attempting conception, and using specific methods (Woldetsadik et al., 2016). To use particular methods, women living with HIV might need self-efficacy to identify their fertile days, limit unprotected sex to their most fertile days, or collect a semen sample that can be inserted vaginally. Only one study conducted in Uganda has examined the effects of self-efficacy on knowledge and attitudes about SC among a sample of people living with HIV (Wagner et al., 2016). In that study, it was found that SC method use self-efficacy was associated with a number of factors including being female, being married, having a partner living with HIV, having greater SC method awareness, and greater motivation to use a SC method (Wagner et al., 2016). In addition, SC method use self-efficacy was related to some relationship and partner dynamics including having more equality in decision-making within one's relationships and greater perceived partner willingness to use a SC method (Wagner et al., 2016). More studies are needed that explore this important construct and the effect it has on the intention to use SC methods.

Behavior Change and Outcome of Interest

The IMB model assumes a direct link between behavioral skills and behavior change (Fisher et al., 2006). In this case, the use of a SC method prior to pregnancy will depend on a mix of information, motivation, and having the necessary behavioral skills. As noted above, various SC methods exist (Bujan et al., 2007; Celum & Baeten, 2012; M. S. Cohen et al., 2011; Donnell et al., 2010; Gray et al., 2007; Mmeje et al., 2012; Vernazza et al., 2011), but women and

couples will need to decide which method is right for them, free of judgment and stigma. Selecting an appropriate SC method will depend on a number of factors including which partner in a relationship is living with HIV, cost, ease of use, and personal choice, to name a few. While research in this area is still nascent, the use of SC methods is of public health significance as the appropriate use of SC strategies can improve the health of women and reduce HIV transmission risks to partners and infants. In that way, SC methods are an important HIV prevention strategy that can help to reduce incident HIV cases during conception while also supporting the reproductive rights of women living with HIV to achieve their desired family size.

Since no formal SC services are currently offered in Botswana in the public sector, the actual use or uptake of such methods is likely to be low. Due to this limitation, it makes sense to study the intention to use SC methods in addition to actual use. A large literature has attempted to specify the relationship between intentions and how these predict behavior. In particular, the theory of reasoned action (TRA) stipulates that an individual's behavior is a function of his/her intention to perform an act (Ajzen et al., 1980). Intentions are seen as the product of an individual's attitudes towards performing a behavior and their subjective norm or perception of referent support for performance of the behavior (Ajzen et al., 1980; Fisher & Fisher, 2000). Such an understanding is not incompatible with the IMB model since similar ideas are captured in the IMB construct of motivation which draws on this work. Therefore, while the model presented here ends with behavior change (the use of SC methods), due to the limitations of the current system in Botswana and the likelihood that SC use is low, intentions as well as use will be assessed.

Rationale

HIV-affected couples desire, and will continue to have pregnancies even when aware of the risks involved (Goggin et al., 2015; Kaida et al., 2014; Mantell et al., 2009) and in the absence of SC support services if they are not provided (Schwartz, Mehta, et al., 2012; West et al., 2016). With high repeat pregnancy rates among women living with HIV and sero-discordance rates close to 50% among couples in sub-Saharan Africa, it is imperative to address the needs of women living with HIV who desire childbearing as they face risks for HIV transmission to partners when trying to conceive (Eyawo et al., 2010). In the era of treat all and U=U, some might wonder why SC techniques matter since if viral suppression is achieved, the risk of HIV transmission to partners should be eliminated (M. S. Cohen et al., 2011; MacCarthy et al., 2009; Rodger et al., 2016). However, routine viral load testing is not available in many sub-Saharan African contexts and not all women living with HIV are virally suppressed (Keiser et al., 2011; Mills, Nachega, Bangsberg, et al., 2006; Schwartz et al., 2017; UNAIDS, 2017). While viral suppression may be the most sustainable long-term goal and worth striving for, SC approaches that compliment ART use are still relevant and should be offered as part of a multi-pronged approach to HIV prevention. Since viral suppression may not be achievable for all people, offering women and couples a range of SC strategies so they can choose the methods they prefer and that are acceptable within their relationships supports reproductive choice. In addition, data from Botswana recently suggested an elevated risk of fetal neural tube defects in women with preconception exposure to the antiretroviral drug Dolutegravir (Zash, Jacobson, et al., 2018; Zash, Makhema, & Shapiro, 2018). This highlights the need for pre-conception counseling, pregnancy planning, and SC strategies in order to protect the developing fetus from

possibly teratogenic regimens. As SC services are not yet routinely offered in Botswana, there are many areas that need exploration before interventions can be proposed.

Since issues related to childbearing and family planning are central to offering SC interventions, it is imperative to understand the attitudes that guide healthcare providers and women living with HIV in Botswana as they navigate issues around childbearing and pregnancy planning. Most SC services offered in sub-Saharan Africa are based on the idea that women living with HIV will plan their pregnancies and will actively seek advice and care from healthcare providers when they desire childbearing. It is possible however that these assumptions are incorrect and may not hold true in Botswana. While the provision of SC services are nascent in a number of sub-Saharan African countries (Goggin et al., 2014; Kawale et al., 2015; Matthews et al., 2015; Mmeje et al., 2015; Ngure et al., 2017; Schwartz et al., 2017), there are currently no studies in Botswana that have focused on SC. Research from various African countries suggests that people living with HIV often face anticipated, perceived, and/or experienced stigma when pregnant or trying to have children. Perhaps because of stigma, few people living with HIV report having fertility desire or SC discussions with healthcare providers (Goggin et al., 2015; Kawale et al., 2015; Matthews et al., 2015; West et al., 2016). However, whether women living with HIV in Botswana experience stigma when pregnant or trying to access reproductive health services is unknown. In addition, whether women in Botswana plan their pregnancies and how they approach childbearing is also largely unknown. Qualitative enquiry that speaks to current attitudes about childbearing will help to develop an understanding of this context, further enquiry, and lay the framework for additional studies.

Various low-cost safer conception (SC) methods to limit HIV transmission risks can be made available in resource-constrained settings (Auvert et al., 2005; Baeten et al., 2012; M. S.

Cohen et al., 2011; Donnell et al., 2010; Gray et al., 2007; Karim et al., 2010; Mmeje et al., 2012; Rodger et al., 2016; Vernazza et al., 2011). However, implementation of SC services in HIV care remains limited in many countries, including Botswana. Few inquiries in high HIV prevalence settings, and none in Botswana, have compared the perceptions of women living with HIV across different SC strategies (Schwartz et al., 2016). A more in-depth understanding of the perceptions of women living with HIV in Botswana regarding different SC methods, including the perceived benefits and challenges to use, can help with the development of policies and service delivery. In addition, understanding the perspectives of women living with HIV and the cultural context in which these techniques would be used is key to developing relevant interventions. Insights in this area can help support women living with HIV to safely achieve their fertility goals by addressing challenges and offering a range of SC options that best meet their needs.

Finally, there may be many reasons why women living with HIV do not often seek SC services including deficits or barriers to information, motivation, or behavioral skills. Few studies have examined SC information among people living with HIV (Wagner et al., 2016) but research from various countries in sub-Saharan Africa suggests that knowledge about SC among people living with HIV is limited (Ngure et al., 2014; Schwartz et al., 2017; Wagner et al., 2016). In addition, aspects of motivation, such as personal fertility desires, partner dynamics, and community and provider-level stigma surrounding childbearing amongst people living with HIV have rarely been examined using quantitative approaches (Goggin et al., 2015; Wagner et al., 2016). Lastly, studies that assess behavioral skills, such as self-efficacy to use SC methods, are limited (Goggin et al., 2015; Wagner et al., 2016). Quantitative studies that examine the

correlates of SC-related information, motivation, and behavioral skills will help program planners in Botswana target SC interventions for women living with HIV who desire pregnancy.

Botswana has one of the highest HIV rates in the world despite high ART coverage and a health system where access to primary care is not a limitation (National AIDS Coordinating Agency, 2014; UNAIDS, 2017). Sentinel surveillance data shows that 27.4% of women aged 15 to 49 are living with HIV (UNAIDS, 2017). MOH policies have provided little guidance on offering SC for people living with HIV (Botswana MOH & Masa, 2016). Given the importance of motherhood in this context, the lack of SC interventions is a glaring gap in the services offered to women living with HIV and represents a missed opportunity to prevent HIV transmissions to partners. However, with its high-functioning health system, extensive ART program, and strong commitment to preventing new HIV infections, Botswana should be well-placed to offer SC services (Botswana Ministry of Health & Government of Botswana, 2012; National AIDS Coordinating Agency, 2014).

By addressing the SC needs of women living with HIV, it may be possible to improve the overall health of women living with HIV while also reducing the spread of HIV to partners and infants. SC should therefore be part of any comprehensive HIV prevention approach and should be integrated as part of a larger continuum of HIV care. In order to develop culturally appropriate Botswana-specific programs, research is needed that identifies feasible and acceptable targets for SC interventions, as no SC studies have been conducted in this context. By focusing on SC, it is possible to support women living with HIV to safely bear children, affirm reproductive rights, support healthy childbearing, and ultimately limit HIV transmission risks.

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CHAPTER 2

Perspectives about Childbearing and Pregnancy Planning Amongst People Living with HIV in Gaborone, Botswana

Abstract

Despite advances in clinical care, safer conception services are not utilised in many high HIV prevalence countries, including Botswana. We conducted in-depth interviews with ten HIV healthcare providers and ten women living with HIV to develop a deeper understanding of attitudes surrounding childbearing and pregnancy planning. Interviews were analysed using a phenomenological approach. Providers felt it was a human right and normative for women living with HIV to have children but also expressed concerns about women living with HIV having children. Women themselves anticipated stigma from providers regarding childbearing although most described supportive care and had not experienced stigmatising treatment. Although providers believed pregnancies amongst women living with HIV were unplanned, women described discussing pregnancy desires with sexual partners. Despite providers voicing a rights-based approach to childbearing amongst women living with HIV, hesitancy towards pregnancy remains. This is felt by women living with HIV and perceived as stigma, which may make them less likely to seek fertility and safer conception advice. Safer conception interventions are unlikely to be successful if women do not feel comfortable discussing childbearing with providers.

Introduction

About 70% of the 35.3 million people living with the human immuno-deficiency virus reside in sub-Saharan Africa and an estimated 60% of these are women, most in their reproductive years (UNAIDS, 2013). Data from various African countries suggests that human immuno-deficiency virus (HIV) infection reduces but does not eliminate the desire for children in HIV-affected couples (Gutin et al., 2014; Keogh et al., 2012; Tesfaye et al., 2012). Childbearing amongst people living with HIV carries certain risks including the possibility of vertical and horizontal transmission. However, with appropriate interventions such as adherence to anti-retroviral therapy (ART), it is possible for women living with HIV to bear children with minimal risks to themselves and their infants and to greatly reduce or eliminate the risk of transmission to partners who may not be living with HIV (M. S. Cohen et al., 2011; Rodger et al., 2016; WHO, 2017). Despite these advances in clinical care, safer conception (SC) services are still nascent in many high HIV prevalence countries, including Botswana.

Women living with HIV often face anticipated, perceived, and/or experienced stigma when trying to exercise their reproductive rights. Women living with HIV in sub-Saharan contexts often fear judgment from their healthcare providers because of their fertility desires (Matthews et al., 2012; Saleem, Surkan, Kerrigan, & Kennedy, 2016). In addition, qualitative studies in sub-Saharan Africa have found that providers often hold negative attitudes about childbearing amongst people living with HIV and encourage people living with HIV to cease childbearing (Colvin et al., 2014; Ddumba-nyanzi et al., 2016; Goggin et al., 2014; Kawale et al., 2015). Women living with HIV in sub-Saharan African settings also report negative provider treatment, discriminatory provider attitudes, and a counseling environment that is perceived as unsupportive of childbearing for HIV-affected couples (Clouse et al., 2014; Colvin et al., 2014;

Gourlay et al., 2014). Examples of this include hostile treatment and scolding from public facility providers and stigmatizing attitudes related to pregnancy amongst women living with HIV. However, sub-Saharan African research suggests that some providers do acknowledge and respect the reproductive rights of people living with HIV (Kawale et al., 2015; Matthews et al., 2014).

In the pre-ART era, the public health response in many countries was to tell women living with HIV to avoid pregnancy due to legitimate concerns about HIV transmission to infants. This tended to stigmatize childbearing amongst women living with HIV. However, in recent years as treatment options have improved and the risk of HIV transmission during pregnancy has been drastically reduced, stigma surrounding childbearing has persisted despite updated policies that are supportive of pregnancy among people living with HIV (WHO, 2017). These policies recognize the fundamental right of women living with HIV to comprehensive sexual and reproductive health services while also recommending that all pregnant women living with HIV should be initiated and maintained on lifelong ART (Botswana MOH & Masa, 2016; WHO, 2017).

Around the world, most SC services are based on the idea that women living with HIV plan their pregnancies and will seek services from healthcare providers when they desire a pregnancy. Pregnancy planning, or the decision-making, communication, actions, and steps to achieving one's pregnancy desires, can vary by context but may include elements such as fertility desire discussions with partners or providers, optimizing health prior to pregnancy, management of long-term health conditions, ceasing high risk behaviors, adopting healthy behaviors, financial planning, and/or discontinuing contraception (Drevin, Kristiansson, Stern, & Rosenblad, 2017; Hall et al., 2013). However, few women living with HIV in sub-Saharan

African settings report having fertility desire or SC discussions with providers and so the idea of planning pregnancies may seem less relevant (Kawale et al., 2015; West et al., 2016). Antenatal sentinel surveillance data from Botswana supports this as 55% of women living with HIV report that their pregnancy was unplanned (Government of Botswana, 2011). Also, research suggests the concept of planned pregnancies may not be culturally salient for some women (Evens et al., 2015; Schaan et al., 2016). The idea of pregnancy planning assumes that behaviors such as childbearing are under an individual's autonomous control without taking into account the varied social, economic, and cultural factors that might impact fertility. For some women, childbearing may include a complex calculation that involves personal desires, the desires of one's partner, and the wider family or community (Evens et al., 2015).

Botswana has one of the highest HIV rates in the world with an adult prevalence of 22.8% (UNAIDS, 2017). Women of reproductive age comprise the largest group of people living with HIV in Botswana with 27.4% of women aged 15 to 49 years living with HIV (UNAIDS, 2017). Despite having high HIV treatment coverage and a healthcare system where access to primary care is not a limitation (National AIDS Coordinating Agency, 2014), Ministry of Health (MOH) policies have provided little guidance on offering SC for people living with HIV (Botswana MOH & Masa, 2016).

In order to develop a deeper understanding of what may influence SC service implementation and uptake in Botswana, it is necessary to appreciate how providers and women living with HIV approach childbearing. We conducted individual in-depth interviews to develop a deeper understanding of the attitudes that guide providers and women living with HIV as they navigate issues around childbearing and pregnancy planning in Botswana. Insights in this area

can help target interventions and enhance sexual and reproductive health services for women living with HIV.

Methods

Setting, Study Population, and Participant Recruitment

We conducted 20 individual in-depth interviews between August 2015 and January 2016 with sexual and reproductive health/HIV providers and women living with HIV in Gaborone, Botswana. Providers and women living with HIV were drawn from government-supported clinics, non-governmental organisation supported clinics, and a clinic at a tertiary educational institution in Gaborone, the capital of Botswana. Eligibility criteria for providers included being a medical doctor, nurse or midwife, 18 years of age or older, willing to participate in the study, able to give informed consent and working at a study clinic in Gaborone. Eligibility criteria for women living with HIV included being 20 to 40 years old, previously or currently pregnant, accessing care at a study clinic in Gaborone, willing to participate in the study and able to give informed consent.

Providers were purposively sampled to represent a range of different healthcare settings where people living with HIV might access safer conception services. Providers were approached at their facilities and assessed for interest and eligibility. All approached providers took part in the study. Women living with HIV were sampled to represent those who might access safer conception services in the public sector (reproductive years (20-40), varying amounts of time on treatment, varying relationship statuses (married, in relationship, single), and varying partner status (concordant positive or discordant relationships)). Women living with HIV accessing care at the study sites were informed about the study by health centre staff. Those who were interested were referred to the study coordinator. The coordinator screened women for

eligibility and explained the study aims. After assessing eligibility, less than 5% of women did not complete interviews, most commonly citing time constraints. Women were reimbursed 30 Botswana Pula (3 USD at the time of the study) to cover transport costs. By using this sampling technique, we were not trying to create a representative sample, but rather, attempting to gather in-depth information that could capture various viewpoints and the lived experiences of women living with HIV and providers (Seidman 2006).

Data Collection

The data collection and analytic processes were informed by a social constructivist framework (Lincoln & Guba, 2013) that is focused on capturing and reporting multiple experiences and perspectives so as to develop an enhanced understanding of a particular context and cultural setting. A social constructivist approach also allows one to learn about a cultural group from their perspective using the language or phrases they use to construct meaning (Patton, 2002). The goal of these interviews was to understand the varied attitudes and experiences of providers and women living with HIV as they navigate issues related to childbearing and pregnancy planning.

The interview guide was drafted, tested, and revised through a collaborative process involving the PI (a sexual and reproductive health researcher from the USA), two experts in the field of sexual and reproductive health/SC (one doctor from Botswana, one researcher from the USA), and two local researchers with many years of experience in sexual and reproductive health/HIV research in Botswana to ensure exploration of appropriate constructs. All members of the study team conduct behavioral research focused on sexual and reproductive health amongst people living with HIV. Provider interview domains included demographics (age, years working

as clinician, years working with people living with HIV), attitudes about childbearing amongst people living with HIV, experiences around people living with HIV becoming pregnant, reasons why people living with HIV desire children, pregnancy planning, and discussions with clients about childbearing. Interview domains for women living with HIV included demographics (age, time since HIV diagnosis, ART status, relationship status, partner HIV status, obstetric history), experiences of pregnancy when living with HIV, treatment and reactions from providers while pregnant, provider attitudes about childbearing amongst people living with HIV, and whether they came to a health center prior to pregnancy to seek SC advice or services.

In-depth interviews with providers were conducted in English by the PI in private spaces at the health center where the provider worked or a private location of the participant's choosing. All providers were fluent in English (the official language of Botswana). Interviews lasted approximately one hour. Local research assistants who were fluent in English and Setswana (the local language) conducted interviews with women living with HIV. Research assistants were all experienced qualitative interviewers. Interviews with women living with HIV took place in English or Setswana, depending on the preference of the participant. Interviews were conducted in private spaces at the health center where the woman was recruited or a private location of her choosing. Interviews lasted approximately one hour. A transcript in English was produced for each interview from either English or Setswana digital recordings. A member of the study team reviewed each transcript for quality and accuracy and corrections were made when necessary.

Data Analysis

We analyzed the data using a psychological phenomenological framework (Creswell, 2013; Patton, 2002). Psychological phenomenology is focused on describing what a given group

of people has in common as they experience a phenomenon. It is an inductive analytic approach that allows the patterns, themes, and categories of analysis to emerge from the data (Creswell, 2013; Patton, 2002). It differs from other approaches to qualitative inquiry in that the primary focus is on identifying elements of a particular phenomenon by describing both what the phenomenon is and how it is experienced by a particular group (Creswell, 2013).

After reading the transcripts and creating memos, we identified significant statements in the data (Moustakas, 1994). These statements were grouped into clusters of meaning and recurring themes (Moustakas, 1994). We iteratively developed inductive codes that emerged from the data to complement our initial a priori codes, which were derived from our research questions (Miles, Huberman, & Saldana, 2014). The PI and a sexual and reproductive health expert identified, discussed, and compared key themes and developed a codebook.

The web application Dedoose was used to facilitate data management and coding (Dedoose, 2016). After examining the main themes in each interview, cross-case and comparative analyses were conducted to deepen our understanding by exploring similarities and differences across cases and between groups (Creswell, 2013; Miles et al., 2014). The PI led the analysis and regularly consulted with collaborators and members of the Botswana study team to discuss interpretation of the data and ensure the cultural salience of findings. In cases where there was disagreement about interpretation, discrepancies were discussed until consensus was achieved.

Ethical Approvals

Ethical approvals were obtained from the University of Michigan Health Sciences and Behavioral Sciences Institutional Review Board (Ann Arbor, Michigan), the University of

Botswana Research Ethics Committee, Office of Research and Development (Gaborone, Botswana), and the Health Research and Development Division of the Botswana MOH. Permissions were also obtained from heads of health facilities before recruitment of providers and women living with HIV took place. Since the only record linking the participant and the research would be the consent document, we received a waiver of documentation of written informed consent in order to fully protect the identities of all study participants. However, all participants provided comprehensive oral informed consent.

Results

Ten interviews with HIV/ sexual and reproductive health providers, and 10 interviews with women living with HIV were conducted (see Table 2-1). The sample of providers consisted of six nurses, three midwives, and one medical doctor. The mean age of providers was 41, they had been clinicians on average for 18 years, and had worked with people living with HIV for a mean of 10 years. The mean age of women living with HIV was 32 years and women had known their HIV status for an average of seven years (ranging from 1-13 years; although one woman was perinatally infected). All women living with HIV were using ART and had used treatment for a mean of six years. Two women were single, three were in relationships (not cohabiting) and five were cohabiting with a partner/ spouse. Seven women reported that their most recent sexual partner was living with HIV while three said their most recent partner was not living with HIV. Women reported a mean of 2.4 lifetime pregnancies and 1.8 living children. Four women were pregnant at the time of their interview (none was a first pregnancy) while six women had recently been pregnant. Nine of the 10 women living with HIV had become pregnant since learning of their HIV status. All women were residing in Gaborone.

The data are presented through textual descriptions of the phenomena. The composite descriptions offer an explanation of the underlying structure which exists across the respondents' experiences (Creswell, 2013; Moustakas, 1994). The results section is organized to reflect aspects of two key phenomena of interest: childbearing and pregnancy planning.

Childbearing

This section explores the ways in which providers and women living with HIV talked about childbearing amongst people living with HIV. A number of distinct themes emerged. Healthcare providers voiced the opinion that childbearing was normative and a human right but also expressed hesitancy towards childbearing amongst people living with HIV. In contrast, women living with HIV thought providers were not supportive of them having children and feared receiving poor treatment from providers if they became pregnant. Despite this, some women described receiving caring support when they were pregnant.

Childbearing as normative and a human right. Both providers and women living with HIV felt it was normative for people living with HIV to desire children, that childbearing was a human right, and it was a personal choice. Both providers and women living with HIV felt that despite one's HIV status, desiring children was a normative part of being a woman in Botswana. Both women living with HIV and providers felt it was natural for women to want to be mothers.

I think everyone desires to be a mother at one point and some people get married and they are HIV-positive and ... around here there is this common understanding that once you are married, to be a real wife, you have to give that man a baby. (Nurse, age 30)

As soon as a woman tests positive, it should be part of the post-counseling. She should be afforded a chance to digest her results but somehow given information about carrying on as a woman which includes having children. (Woman living with HIV, age unreported)

Providers generally described a rights-based approach to people living with HIV having children, expressing that there was no law saying that people living with HIV could not get pregnant and that HIV status does not mean that women cannot be pregnant. Providers also felt that childbearing was a personal choice and that people living with HIV can make their own informed decisions. Some providers also felt their role was to advise clients, not to deny them the chance to have children. Only one woman living with HIV echoed this idea. Women living with HIV did not use language about rights or reproductive choice.

They [people living with HIV] have the right to reproduce so we cannot deny them ... It's their right to have children ... there's no law that says you HIV-positive people, you are not going to get pregnant. (Midwife, age 38)

It's not their [healthcare provider's] place to tell me if I can or cannot have another baby. (Woman living with HIV, age 25)

Healthcare provider concerns about childbearing. Despite expressing that childbearing was normative and a human right, most providers had concerns about childbearing amongst people living with HIV, suggesting that childbearing under certain conditions was

troubling. Three main sub-themes emerged with regard to provider concerns. Concerns focused on repeat pregnancies, pregnancies in discordant relationships and the inability of providers to influence pregnancy decisions.

Concerns regarding repeat pregnancies. Some providers voiced uneasiness about repeat pregnancies, suggesting that one pregnancy was acceptable but repeat pregnancies are concerning because of health risks for the mother and transmission risks for the partner and infant. When trying to communicate these concerns, providers sometimes used language that suggested to women living with HIV that they did not encourage pregnancies.

We do give some advice to say if you have a child, what really prompts you to have the second child? ... We ... talk to them and see what really prompted them to be pregnant-not necessarily meaning that she shouldn't be pregnant – we look at all these avenues ... and you'll find maybe somebody has four children and she wants another child. So we will ask what really forces you to have children? What pushes you to have the fifth child?
(Nurse, age 55)

You know some nurses, when inside the consultation room, they will tell you to your face. They can say why do you continue getting pregnant? Don't you think you should stop having children? Others will say, use pills or don't you know condoms are free?
(Woman living with HIV, age 38)

Concerns regarding transmission to partners. Childbearing in the context of discordant relationships was seen as a challenging situation for providers. Despite recognition of the right to have children, there was concern about people living with HIV infecting partners and about blame for HIV infection within relationships. Providers seemed hesitant to encourage childbearing because they felt that even though conception could be made safer, it was not possible to completely rule out the risk of transmitting HIV.

With the discordant partners it's controversial because you will think of somebody transmitting HIV to the other and having in mind that I'm HIV-positive and this one is HIV-negative ... But also they have the right to have children as well. But it's a dilemma.
(Midwife, age 38)

For you to have a baby you need to not be using any protection. Now if you are going to be having a baby and you don't use protection, there are high chances of you being infected. Are you telling us that you don't mind being infected? And also the implications that may arise afterwards because somebody can turn around afterward and say you infected me. So we really talk to them ... and those that are positive, we will advise them to come here but the majority they don't come. (Nurse, age 55)

Concerns regarding pregnancy decisions. Most providers felt it was inevitable that women living with HIV were going to become pregnant and there was little they could do to either prevent pregnancy or help women before pregnancy occurred. Providers said that they had to accept the situation and do the best they could to ensure the health of infants. This same view was expressed by some of the women living with HIV.

It's a dilemma, you see that this lady is pregnant and you know her status ... she's on treatment, on ART, and she's pregnant. You know you have to accept the situation and now take steps so they remain ... in good health status ... and prepare for the baby. (Midwife, age 38)

I am of the view that if you are pregnant then there is nothing they [healthcare providers] can do. They cannot terminate the pregnancy. They can't do anything – so it is just to help that person move on. (Woman living with HIV, age 39)

Women living with HIV anticipate stigma from providers. In contrast to the rights-based language used by providers, the main theme that emerged from women was the feeling that they were not supposed to have children. Most women felt providers were not supportive of people living with HIV having children and as a result, did not share information about how to have safe pregnancies. The language that providers used during consultations also suggested to women either overtly or subtly that childbearing by women living with HIV was not encouraged. Some women anticipated stigma and were concerned about what nurses would say to them if they became pregnant. Although one woman described a situation in which she felt stigmatised, most women had not personally experienced the stigmatising behaviour they feared. The anticipation of stigma seemed to come from stories women had heard from other women about poor treatment from nurses.

They [healthcare providers] do not encourage women who are HIV-positive to have children, they believe that once one has the virus she should not be pregnant so they don't

tell them that one can take certain steps and then be able to have a child safely. (Woman living with HIV, age 35)

This time they were not happy, especially after I told the doctor the father of the child is HIV-positive also. (Woman living with HIV, age 31)

Supportive care from providers. Despite a feeling that providers did not support pregnancies amongst people living with HIV, many women reported positive experiences where they received support from providers when they were pregnant. Women living with HIV described situations where providers were kind and encouraged them that they could have safe pregnancies.

She [the provider] was the one who kept saying I am going to have a baby, she kept giving me support. ... she told me ... that I can fall pregnant. (Woman living with HIV, 35 years)

My second pregnancy I received good help, the nurses in this clinic are very nice ... I know in some clinics like in our village, nurses can be rude to women. They can say we want to die, or we cost the government or that we are careless. That is why I don't like going to village clinics. I don't want to be insulted. (Woman living with HIV, 31)

Pregnancy Planning

This section explores the idea of pregnancy planning for women living with HIV in Botswana. A common theme that emerged among providers and women living with HIV were that some pregnancies are unplanned. However, it also appeared that while most providers believed that the majority of pregnancies amongst women living with HIV were not planned, women themselves described some elements of planning. It appeared that providers and women conceptualise pregnancy planning in different ways.

Conceptualizations of pregnancy planning. Most providers associated “planning” with seeking medical advice from a healthcare provider. If women did not seek clinical pre-conception counseling, providers often saw this as a lack of pregnancy planning. Women however tended to view pregnancy planning as discussing pregnancy desires with partners and taking steps to protect their partners from HIV transmission.

I think the perfect plan would be talk to your healthcare providers so they can assist you with a process before you start trying. ... The pregnancies, unless they talked to a healthcare worker, I think chances are they are probably not planned. (Doctor, age 42)

Pregnancy as a planned event. Providers and women agreed that some pregnancies are unplanned. Providers said it was common for women living with HIV to report that their pregnancies had ‘just happened’, that condoms ruptured, or they were unprepared for a pregnancy when it occurred. Similarly, some women (aged 25 to 31) said their pregnancies just happened.

Few are planned. Others I would think they are not planned because we ask them, was it your intention to be pregnant and they say no. They say, I was using a condom and it burst – that is the thing – few would say yes. (Nurse, age 55)

It [the pregnancy] was a mistake. We were not prepared to have a child. It just happened.
(Woman living with HIV, age 25)

Pregnancy to fulfill a partners' desire for children. In their interviews, most women highlighted their male partner's desire for children as a key factor impacting their pregnancy desires. Most women had discussed childbearing with their partners and their partner had a say in whether they became pregnant. Some women said that it was their partners who had greater childbearing desires than they did. In addition, some women had children from previous relationships but felt the need to have children with new partners.

We spoke and discussed the issue between the two of us. He wanted a child more than I did. (Woman living with HIV, age unreported)

We have to agree on everything [related to childbearing] but I'll admit he has more say than me ... He earns more and he is the man, culturally he is the head of the house.
(Woman living with HIV, age 24)

Pregnancy and safer conception discussions with partners. Despite providers feeling that pregnancies were often unplanned, most women living with HIV described discussing

childbearing desires with their partners. Some couples had also discussed ways to make conception safer. One woman described doing research on the internet about ways to make conception safer while another explained that she and her partner discussed possible ways to protect him from acquiring HIV when trying to conceive. Echoing this, some providers felt that women planned pregnancies by discussing their desires with partners.

... when we decided to have this kid ... I said ... maybe let's go ... to South Africa, and get the artificial thing ... no contact, but he said well, I know your status and I am in all the way. Why can't we just do it naturally? The natural way, not having to do some things that may then be expensive and maybe I will not feel comfortable with it. (Woman living with HIV, age 39)

I think most of the time they discuss with their partners on when and how, when ... to reproduce. (Nurse, age 33)

Pregnancy planning discussions with providers. Although women described discussing pregnancy desires and sometimes SC with partners, few discussed pregnancy desires with providers. Providers often said they told women living with HIV to speak with them when they desired a pregnancy, although few did. However, some providers recognised that although many women say their pregnancies are unplanned, it may be that women fear seeking services from healthcare providers prior to pregnancy, causing few women living with HIV to admit that they desired or planned pregnancies. Only one woman living with HIV had gone to seek formal

advice from a provider before trying to become pregnant even though most women interviewed had experienced a pregnancy after learning their HIV status.

I honestly think a lot of women are scared to ask or initiate conversations with nurses, just like I was. (Woman living with HIV, age 24)

Why would I tell a nurse that I am having sex? (Laughing) (Woman living with HIV, age 25)

Discussion

Most SC interventions are predicated on the idea that pregnancies are planned and that women living with HIV will seek advice from providers when they want to conceive. In this qualitative study of healthcare providers and women living with HIV from Botswana, we found that despite providers voicing a rights-based approach to childbearing, hesitancy towards pregnancy among people living with HIV remained. Anticipated stigma was experienced by women living with HIV and may make them less likely to seek fertility and SC advice. In addition, providers generally believed pregnancies amongst women living with HIV were unplanned because women did not seek provider guidance prior to conception. However, women living with HIV did describe discussing pregnancy desires with partners, suggesting some elements of planning. This difference in the way that women living with HIV and providers conceptualise pregnancy planning is an important challenge. It may be possible to reach women living with HIV with SC information and strategies when they have begun childbearing discussions with their partners. However, women are unlikely to seek SC services unless they

view providers as supportive of childbearing. No studies in Botswana have previously examined the attitudes of providers and women living with HIV towards childbearing and pregnancy planning amongst people living with HIV in the context of SC.

This study suggests that providers in Botswana are at a turning point as it relates to supporting childbearing for people living with HIV. All providers recognised the right of people living with HIV to be pregnant and the cultural pressure to bear children despite HIV status. Providers also took a normative pro-natalist approach towards expectations of motherhood and appreciated the importance of motherhood to one's gender identity as a woman in Botswana. This is encouraging, as providers in other contexts have been reported to hold negative attitudes towards childbearing amongst people living with HIV (Colvin et al. 2014; Ddumba-nyanzi, Kaawa-ma and Johannessen 2016; Goggin et al. 2014). However, providers also voiced hesitancy towards childbearing amongst people living with HIV with particular concern for discordant couples and repeat pregnancies. A similar tension has been noted in other sub-Saharan African settings where providers have expressed a rights-based approach to people living with HIV having children, but also voiced reservations about such childbearing (Kawale et al. 2015; Goggin et al. 2014). In light of research that has shown that ART adherence can eliminate the risk of transmission to uninfected partners and that prompted UNAIDS and other leading scientific and medical organizations to launch the Undetectable = Untransmittable (U = U) campaign, it will be imperative to educate providers that people living with HIV with an undetectable viral load cannot transmit HIV. This may help to further reduce HIV transmissions and ensure reproductive rights for women living with HIV.

It may be that providers are struggling with ever changing HIV care possibilities and client needs. Historically, the response was to deny people living with HIV their reproductive

rights due to concerns about HIV transmission risks to partners and infants (Steiner, Finocchiaro-Kessler and Dariotis 2013). However, updated guidelines on sexual and reproductive health for women living with HIV stress the reproductive rights of women living with HIV and studies suggest people living with HIV can greatly reduce the risks of HIV transmission to partners and infants (Cohen et al. 2011; Pettifor et al. 2011; WHO 2017). While the general outlook of providers seems more supportive of reproductive rights for people living with HIV, improvements can be made since providers are having trouble translating rhetoric into practice. Current Botswana HIV clinical care guidelines mention various SC approaches but provide little guidance on the package of services to offer women living with HIV who want to become pregnant (Botswana MOH & Masa, 2016). More detailed SC counseling guidelines would aid providers in delivering this service to HIV-affected couples.

Although women living with HIV felt their childbearing was not supported, they generally did not experience overt stigmatisation while accessing HIV care. This is in contrast to other settings where women living with HIV have reported high levels of provider stigma when trying to access sexual and reproductive health services (Clouse et al. 2014; Gourlay et al. 2014). It is possible that stigma operates more subtly in Botswana. For example, while providers did not express overtly stigmatising views towards childbearing amongst people living with HIV, their statements suggest hesitancy about women living with HIV having repeat pregnancies or children within discordant relationships. It is also possible that what is perceived as stigma may be a lack of provider knowledge about SC. Knowledge about SC among providers has been found to be low in some sub-Saharan African contexts (Kawale et al., 2015; Matthews et al., 2014). SC educational campaigns for providers may help address this issue. In addition, the sense of helplessness that providers expressed with regard to either preventing pregnancy or

encouraging SC before pregnancy occurs may add to the feeling amongst women living with HIV that providers do not approve of people living with HIV having children. As a result, women living with HIV anticipate stigma from providers for their reproductive choices. This is similar to a South African study in which participants reported anxiety over perceived judgmental attitudes from providers towards people living with HIV who want children (Matthews et al., 2015).

Providers and women living with HIV described differing views about what constitutes pregnancy planning. Most providers associated “planning” with seeking pre-conception advice from a provider and saw the advice they could provide women about their health as the most important component of pregnancy planning. However, as noted in other contexts (Goggin et al., 2014; West et al., 2016), providers reported that few women living with HIV or couples seek pre-conception counseling and instead arrive for services when pregnant. In light of the anticipated stigma that women living with HIV described, it is not surprising that few women seek such services. In addition, this focus on clinical advice neglects an appreciation of other factors that might impact childbearing decisions.

Although they generally had not received formal pre-conception counseling before becoming pregnant, most women living with HIV had discussed childbearing with their partners and their partner had a say in whether they became pregnant. This highlights the importance of partners in reproductive decision-making, which has been noted elsewhere (Gutin et al., 2014; Tesfaye et al., 2012). This is also supported by a study from Botswana in which 52% of men said they communicated with their partners about pregnancy (Letshwenyo-Maruatona & Gabaitiri, 2018). Focusing on male partner engagement and targeting the forms of communication that men in Botswana are most comfortable with, such as receiving information from the media or from

male clubs (which are groups used to sensitize men about sexual and reproductive health programs), may help to further involve men in sexual and reproductive health services (Letshwenyo-Maruatona & Gabaitiri, 2018).

These findings draw attention to two assumptions that guide most SC interventions: namely, the idea that pregnancies are planned and that women living with HIV will seek advice from providers when they want to conceive. The data from this study suggest that women in Botswana may be planning their pregnancies by discussing fertility desires with partners. However, they generally do not seek pre-conception advice from providers, thereby foregoing services that could optimize their health, improve treatment adherence, reduce the chances of partner transmission, and protect fetuses early in pregnancy. In addition, this research highlights that women may not seek SC services from providers because they anticipate stigma. SC interventions are unlikely to be successful if women do not feel comfortable discussing childbearing with providers. In order to destigmatize childbearing for people living with HIV and to reach more women who may be contemplating pregnancy with comprehensive reproductive healthcare, it is necessary to routinely discuss fertility desires at HIV care visits with all people living with HIV of reproductive age. This should be followed by either the provision of SC or contraceptive services in order to fully support the reproductive rights of people living with HIV to have or limit pregnancies as they see fit. With time, such discussions may help normalize childbearing and reduce the stigma that women living with HIV anticipate.

Strengths and Limitations

This study has both strengths and limitations. This was an urban sample and the findings are not generalizable to all contexts. The sampled healthcare providers consisted mostly of

nurses and midwives. It is possible that the attitudes of this cadre of providers may differ from higher or lower-level providers. However, since nurses provide the bulk of primary healthcare in Botswana (WHO Regional Office for Africa and African Health Observatory 2016), the attitudes of this group are especially relevant. The sample size of ten women living with HIV and ten providers is modest. As a result, important attitudes might have been missed but providers and women living with HIV repeated the same themes, despite the small sample. Finally, women living with HIV in this study were interviewed at various points during or following their pregnancy. It is possible that perceptions may vary depending on the amount of time since pregnancy, creating some issues with recall. However, interviewing women at various points in their pregnancies or post-partum allowed us to examine the diverse attitudes of women living with HIV who had recently experienced pregnancy.

Conclusion

Childbearing is a human right and central to the construction of gender identity for many cultures, regardless of HIV status. Women living with HIV will continue to have children despite advice from providers to stop childbearing and regardless of the HIV transmission risks involved (West et al. 2016). As Botswana continues to implement a test and treat approach, greater numbers of people living with HIV who have childbearing desires will enter care. Offering safer conception services as part of a larger continuum of care supports the rights of people living with HIV, can reduce HIV transmission risks, and support healthy childbearing.

Table 2-1: Demographic characteristics of recruited IDI participants

Women living with HIV (n=10)	
Mean age	31.9
Relationship status	
Single	2
In relationship (not cohabiting)	3
In relationship/married (cohabiting)	5
Mean years since HIV diagnosis	7
Currently on ART	10
Mean years using ART	5.9
HIV status of primary partner	
HIV-positive	7
HIV-negative	3
Mean number pregnancies	2.4
Mean number living children	1.8
Pregnancy after learning HIV-positive status	
Yes	9
No	1
Currently pregnant	
Yes	4
No	6
Healthcare providers (n=10)	
Mean age	41.1
Clinical cadre	
Nurse	6
Midwife	3
Doctor	1
Mean years as clinician	17.7
Mean years at clinic	5.5
Mean years working with people living with HIV	9.9

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CHAPTER 3

“I Did Not Know About All These”: Perceptions Regarding Safer Conception Methods by Women Living with HIV in Gaborone, Botswana

Abstract

Various low-cost safer conception (SC) methods to limit HIV transmission risks can be made available in resource-constrained settings. However, implementation of SC services in HIV care remains limited in many countries, including Botswana. Understanding perceptions about specific SC methods and the benefits and challenges to use can help with the development of policies, interventions, and service delivery. Between February and June 2018, 45 women living with HIV who were accessing support group services in the greater Gaborone, Botswana area participated in focus group discussions. Themes were analyzed using an interpretive phenomenological approach. Key factors influencing method perceptions reflect issues to be addressed at the individual (knowledge of methods, personal motivation to protect partners from HIV transmission, and risks), interpersonal (partner support and communication, relationship intimacy, reducing partner transmission risks, provider stigma), health systems (access and availability, the cost of methods, human resource shortages), policy (Ministry of Health policies), and socio-cultural levels (cultural acceptability of methods, norms of masculinity). Although a lack of prior knowledge and counseling about SC methods was mentioned as a challenge to uptake, this did not seem to affect interest, in particular for pre-exposure prophylaxis (PrEP) and vaginal insemination. Interventions will need to address concerns at multiple socio-ecological levels for SC uptake to become a common practice. In addition, offering a range of SC methods

should be a routine part of HIV care so that HIV-affected couples can reduce HIV transmissions risks while also fulfilling their childbearing desires.

Introduction

The vast majority of the 36.9 million people living with HIV worldwide are in their reproductive years (UNAIDS, 2018a). Data from various sub-Saharan African countries suggests that childbearing desires among both men and women living with HIV remain strong with 20 to 51% expressing a desire for children (Gutin et al., 2014; Kawale et al., 2015; Ngure et al., 2014; Tesfaye et al., 2012). Many new HIV infections in sub-Saharan Africa occur in long-term sero-discordant relationships (Dunkle et al., 2008; Matovu, 2010), and intended conception likely contributes to many of these incident cases of HIV (Beyeza-Kashesya et al., 2010, 2009; World Health Organization, 2012). In this context, acceptable and effective safer conception (SC) techniques that can offer opportunities to reduce the risk of horizontal transmission to partners are especially important to stemming HIV transmissions. Also, while SC is most applicable for discordant couples, there are also SC benefits for sero-concordant couples such as preventing HIV superinfection and transmission of drug resistant virus (Bekker et al., 2011).

SC methods for resource-limited settings include the use of both behavioral and pharmacologic reproductive strategies. Some methods, such as condomless sex limited to the time of peak fertility (known as timed unprotected intercourse) (Vernazza et al., 2011) and vaginal self-insemination when the female partner is living with HIV (Bekker et al., 2011; Mmeje et al., 2012) are conception specific. Other strategies, such as antiretroviral therapy (ART) to suppress the viral load of the person living with HIV (M. S. Cohen et al., 2011; Donnell et al., 2010), the use of oral pre-exposure prophylaxis (PrEP) by the partner who does

not have HIV (Baeten et al., 2012; Grant et al., 2010; Karim et al., 2010), and medical male circumcision for HIV uninfected male partners (Auvert et al., 2005; Gray et al., 2007) are not conception specific but are valuable SC options. Studies in Kenya, Uganda, and South Africa have indicated that all of these methods are acceptable and have been used by HIV-affected couples (Mmeje et al., 2015; Schwartz et al., 2017; Wagner et al., 2017). Ideally, couples should know about and be offered the full range of SC risk reduction strategies and encouraged to select the methods that are acceptable and feasible for both partners.

However, the implementation of SC services for HIV-affected couples within healthcare settings remains limited in many resource-limited countries, including Botswana. Data from Botswana shows that 27.4% of women aged 15 to 49 years are living with HIV (UNAIDS, 2017), that between 60 to 70% of women know they are living with HIV before becoming pregnant (Government of Botswana, 2011; Mayondi et al., 2016) but that 44 to 50% of women report that their pregnancies were unintended (Doherty et al., 2018; Mayondi et al., 2016; National AIDS Coordinating Agency, 2014). While Botswana is rapidly expanding ART coverage and is already on track to reach UNAIDS 90-90-90 targets sooner than 2020, the HIV incidence rate in the country indicates substantial ongoing transmissions (Gaolathe et al., 2017). This highlights the need for SC methods that can complement ART in reducing horizontal transmissions. However, SC services have not yet been made routinely available in public sector healthcare clinics.

Few inquiries in high HIV prevalence settings, and none in Botswana, have compared the perceptions of people living with HIV across different SC strategies (Schwartz et al., 2016). This research sought to gain a more in-depth understanding of the perceptions of women living with HIV in Botswana regarding different SC methods, including their perceived benefits and

challenges. We explored knowledge and perceptions toward specific SC methods that could be made available in the public sector health system. Understanding the perspectives of women living with HIV and the cultural context in which these techniques would be used is important and key to developing relevant interventions. Insights from this study will inform policies and interventions that support HIV-affected couples to safely achieve their fertility goals by addressing challenges and offering a range of SC options that best meet their needs.

Methods

Study design and population

Informed by the information, motivation, and behavioral skills (IMB) model (Fisher & Fisher, 2000), eight qualitative elicitation focus group discussions (FGDs) took place between February and June 2018 in the greater Gaborone, Botswana area. FGDs were used because many of the factors that affect SC method uptake are cultural phenomena that can be enriched when discussed in a group setting. A group setting was ideal for investigating these phenomena because the interaction between participants allows members to hear, reflect on, and elaborate on the comments and ideas of others. In this way, participants are able to agree or disagree, react to various opinions, and elaborate on their views when either encouraged or challenged by other participants (Bradbury-Jones, Sambrook, & Irvine, 2009). This approach helps to validate the points being raised as shared experiences. This can stimulate discussion, encourage interaction and clarification among participants, and open up new perspectives (Bradbury-Jones et al., 2009).

All women living with HIV were recruited for FGDs from Botswana Network of People Living with HIV (BONEPWA+) affiliated support organizations. BONEPWA+ is

a national umbrella body formed in 2000 by and for people living with HIV. BONEPWA+ coordinates and manages support groups for people living with HIV, provides people living with HIV with empowering skills and strategies, and helps strengthen linkages between prevention, care, and support services. Women living with HIV were sampled based on age (18 to 60 years) and pregnancy history (never pregnant, currently pregnant, not currently pregnant but already mothers) so that a range of possible experiences and attitudes would emerge. We had originally planned that the upper limit of our age range would be 45 years but due to community requests, and a desire to be responsive and respectful, we extended our age range to 60 years. By using this sampling technique, the intent was not to create a representative sample, but rather, to capture various viewpoints as well as the lived experiences of women living with HIV, who primarily access SC services (Seidman, 2006).

Women living with HIV were recruited through BONEPWA+-affiliated support organizations using one of two approaches. First, community-based research advocates recruited some participants following support group meetings. Second, posted flyers at support group sites contained basic information about the study and contact information so that interested women could contact the PI. Study coordinators screened women living with HIV and explained the study aims. Women living with HIV were reimbursed 30 Botswana Pula (approximately 3 USD at the time of the study) to cover the costs of local transport and offered snacks during FGDs.

Ethical approvals were obtained from the University of Michigan Health Sciences and Behavioral Sciences Institutional Review Board (Ann Arbor, Michigan), the University of Botswana Research Ethics Committee, Office of Research and Development (Gaborone, Botswana), and the Health Research and Development Division of the Botswana Ministry of Health. Permission was also obtained from the Executive Director of BONEPWA+ and support

group leaders before recruitment of women living with HIV took place. All FGD participants were provided with a written statement regarding the research and their rights before providing written informed consent. In addition, all participants signed a confidentiality agreement that stipulated that all FGD members understood that what was discussed in the group was private and confidential.

Data collection and analysis

FGDs were employed to explore the perceptions of women living with HIV in Botswana regarding different SC methods, including their perceived benefits and challenges. The data collection and analytic process were also informed by the social constructivist framework (Lincoln & Guba, 2013) through a desire to capture and report multiple experiences and perspectives so as to develop a deeper understanding of a particular context. This allowed the women to define and describe the various concepts and ideas related to SC in their own words, and for them to articulate how SC is understood and practiced (or intended to be practiced) within their particular community and cultural context.

The interview guide was drafted, tested, and revised through a collaborative process involving the PI (an English-speaking, non-African White female, sexual and reproductive health researcher from the USA who is a mother and is not living with HIV), two experts in the field of sexual and reproductive health/SC (one doctor from Botswana, one researcher from the USA), two local researchers with many years of experience in sexual and reproductive health/HIV research in Botswana and advocates for people living with HIV, to ensure exploration of appropriate constructs. All members of the study team conduct behavioral research focused on sexual and reproductive health amongst people living with HIV. FGD domains included

information about SC methods (e.g. methods with which women living with HIV were familiar, methods for which they would like more information) and perspectives (SC methods in which they were most interested, methods in which they were least interested, perceived benefits and challenges to use).

Local research assistants conducted FGDs in a mix of Setswana (the local language) and English. Research assistants were all experienced qualitative interviewers with topical expertise in HIV and sexual and reproductive health. Research assistants received training in the ethical treatment of human participants and the informed consent process. All FGDs took place in private rooms at the BONEPWA+ offices in Gaborone, in the location where the support group usually met, or at the University of Botswana main campus. FGDs consisted of 3 to 9 women living with HIV per group. FGDs lasted one hour and 42 minutes on average (ranging from one hour to two hours and 17 minutes). Interactive techniques including a small group breakout session, the use of cards with SC methods and information on them, and pile sorting were used to enhance comfort and participation and to gain greater depth in understanding.

To assess the perspectives of women living with HIV about SC methods, each participant received a set of five cards that described basic information about various SC methods, including PrEP, vaginal insemination, timed unprotected intercourse, medical male circumcision, and ART. After having time to review each card, participants were broken into small groups to discuss the methods further. These small groups were used to allow for greater levels of participation and to increase comfort when discussing this intimate topic. After discussing methods in their small groups, women were asked to put the cards in a pile based on which method they would be most interested in using (with the one they were most interested in on the top, and the one they were least interested in on the bottom). Due to a variety of factors, pile-

sorting data is only available for 34 of the 45 FGD members. The full group of women were then asked to reflect on why they were most interested in their top choice method and why they were least interested in their last choice method. They were also asked about which methods they thought their partners would be willing to use and which methods they desired more information about. FGDs were transcribed verbatim from digital recordings in the language the interview was conducted and then translated into English. A member of the study team reviewed each transcript for quality and accuracy and corrections were made when necessary.

The data for this study were derived from eight FGDs with a total of 45 women living with HIV participants. The data analysis was guided by an interpretive phenomenological approach (J. A. Smith, Flowers, & Larkin, 2009). Interpretive phenomenology focuses on understanding people's perceptions, perspectives, and lived experiences by prioritizing the viewpoint of the participant. This also allows one to examine the social and cultural contexts in which the data emerged. It is a particularly useful approach because it can be used to examine the rationale and motivations for engaging in a behavior or not, and it is a research method that is capable of examining the role of social norms in individual's lives (Frost, McClelland, Clark, & Boylan, 2014). The method has also been used to understand how people are affected when their sexual behaviors are defined as problematic and are stigmatized (Frost et al., 2014). This makes interpretive phenomenology particularly useful for examining SC amongst women living with HIV because childbearing among people living with HIV has a history of being stigmatized.

All FGDs were coded by two independent coders (the PI and one local research assistant) to ensure reliability. Data analysis began by reading hard copy transcripts, creating memos, and assigning initial codes (Miles et al., 2014). Using this process, we identified recurring themes and it was possible to inductively develop descriptive codes to complement initial deductive

codes, which were derived from the study research questions (Miles et al., 2014). During this process, new codes were added and old ones modified and deleted based on the information provided by participants in the transcripts. Themes were discussed and compared and a codebook was developed. We then reviewed the coded text and initial findings were verified by reviewing the relevant segments in each transcript to ensure that the context and meaning were preserved. In cases where there was disagreement about interpretation, discrepancies were discussed until consensus was achieved. Following this phase of coding, translated interviews were entered into the web application Dedoose (www.dedoose.com) to assist in systematic data management, code application, and searching the text (Dedoose, 2016). We then conducted cross-case analysis to deepen our understanding by examining similarities and differences and to identify recurring themes (Miles et al., 2014). In the section that follows, characteristic quotes are used to illustrate the concepts and themes that emerged.

Results

Participants ranged from 19 to 60 years old, with a mean age of 37 years (nine women were over the age of 45). Most (93%) participants had ever been pregnant. In addition, 93% had at least one child with a mean of 2.4 children per woman (range of 0-7). On average, women had been diagnosed with HIV 10 years ago (in 2008, range of 1993 – 2018).

The results section is organized to examine themes under two primary categories. First we discuss information, perceptions, benefits, and challenges for each of the SC methods that were discussed. Next, we discuss benefits and challenges that cut across all methods and could aid or hinder greater SC method uptake.

Information, perceptions, benefits, and challenges by method

During FGDs, women living with HIV were presented with and discussed five SC methods: PrEP, vaginal insemination, timed unprotected intercourse, medical male circumcision, and ART. Women mentioned perceived PrEP and vaginal insemination benefits and challenges in greater depth than those for timed unprotected intercourse, medical male circumcision, or ART even though PrEP and vaginal insemination were approaches that were less well known (see Table 3-1).

PrEP information and perceptions. Despite not having heard much about PrEP, after reading a short description of the method, women living with HIV had an overwhelmingly positive response to the use of PrEP by their male partners as a SC method. PrEP was the SC method that women said they were most interested in using (18/34 women) and many wanted more information about the method.

PrEP benefits. The benefits of PrEP discussed by women living with HIV centered on 4 main areas: preserving sexual intimacy, feeling natural, offering additional HIV transmission protection, ease of use, and necessitating couple communication. Women living with HIV liked PrEP because they felt that it preserved sexual intimacy/physical connection and made the conception process feel more natural as compared to some of the other SC options. A key benefit was that PrEP offered added protection for their partners above their personal viral suppression when they were trying to become pregnant. Women also valued that PrEP is an easy to use method that forces couples to communicate and discuss pregnancy plans so they are in agreement before trying to have children.

I feel that it's the best because there is intimacy and connection. ... I mean there is bonding as compared to the artificial insemination one [referring to vaginal insemination]. (26 years old)

Some [partners] wouldn't want to just say ok we can have unprotected sex. They still have that thought at the back of their minds "ok what if she infects me?" So like this thing [PrEP] it will only be an assurance to them that you are fully protected now. (35 years old)

There is an agreement between two people that they want to have a child. Like right now, I am pregnant and that was not my intention to, we didn't agree on the pregnancy so with this method there is no such thing, there has to be an agreement. (29 years old)

PrEP challenges. Although women were very interested in PrEP as a SC option, they also mentioned concerns that focused around four areas: Availability of PrEP, cost, knowing where to go for services, and concerns about proper PrEP adherence by their partners. Women living with HIV were concerned that PrEP was only available in the private sector and therefore out of reach for most people in Botswana, who predominantly access care in the public sector where services are low cost or free. Since PrEP has generally been made available in the private sector so far, it can carry a hefty price tag, making the method too expensive for many couples. Since PrEP is also a fairly new method in Botswana, women were not clear about where to seek PrEP for SC. Lastly, some women had concerns about partner adherence to PrEP and making

sure partners took the pills correctly so they would actually receive the added protection that PrEP could offer.

We could say PrEP ... can be accessed by people who perhaps have medical assistance in the form of medical aid and they are working but an ordinary Motswana is not privileged enough to get this service. (34 years old)

There is an issue with PrEP that the Ministry of health has not rolled out the guidelines that it can now be used, the people that use it are the ones that go to private hospitals. (37 years old)

When you go to your Doctor and they write that prescription ... it's mostly expensive because now I'll take that prescription, go to the pharmacy and buy that bottle of about P500. That's how it is. (35 years old)

You know now the access to PrEP services and PrEP care ... it's more like going to your Doctor and there is no specific person that you can say that "when it comes to PrEP this one I will go to." (35 years old)

I do not trust this pill method [PrEP]. A person will be given these to take at home right? I will not be sure that they take them properly and in time. (29 years old)

Vaginal insemination information and perceptions. Although vaginal insemination was not a SC method that many women living with HIV were aware of, some women had a very positive response to the method. Many women (14/34) said that vaginal insemination was the SC method they would be most interested in using. Vaginal insemination was the method that women most wanted more information about.

Vaginal insemination benefits. The benefits of the method focused around two main areas: eliminating HIV transmission risk when trying to conceive and the low cost of the method. The most commonly mentioned reason for why women liked vaginal insemination was that it was a method that ensured that their negative partners would not be at any risk for HIV transmission. In addition, it was mentioned that vaginal insemination is an inexpensive SC option.

I like vaginal insemination because you will be 100% sure that there is no contact of the virus. (37 years old)

I like it because a woman, the man without the virus but wanting a child you can use it ... it is the best one for him because you will find it difficult when the man doesn't have the virus and you want a child and you keep saying I want a child. (50 years old)

I didn't know that it was the easiest and most cheapest method ... I even went to buy the syringe ... and it was about P2 [2 pula, approximately 20 US cents]. So ... this is the cheapest. So I like it for that. (35 years old)

Vaginal insemination challenges. Vaginal insemination was not an especially well-known method and women mentioned a number of challenges that were specific to this method. Challenges focused around three areas: the cultural acceptability of the method, a sense that the method was unnatural and reduced intimacy between partners, and concerns about using the technique at home without the assistance of a healthcare provider. A commonly mentioned barrier was that vaginal insemination would not be culturally acceptable and as such, men might be distrustful of this method and doubt the paternity of babies born using this technique. There was also some concern that men's masculinity might be in question using an insemination method, further making the method less culturally acceptable. Women also felt that this approach lacked intimacy and desired a method that promoted bonding with their partners when trying to conceive. Women also voiced some concerns about the mechanics of using a vaginal insemination technique at home and mentioned a need for training before attempting to use the method at home, unassisted by a healthcare provider. Finally, Botswana is a country with a strong connection to cattle herding and animal husbandry. A common rumor was that insemination approaches were only used with cattle and not people.

I would be more interested in vaginal insemination... but I am sure my partner would not be interested in it. Botswana men believe in a normal and straightforward sexual intercourse, skin to skin. (37 years old)

I feel that ... after falling pregnant ... they [your partner] may backtrack or change their mind and blame the pregnancy on you, saying since it's artificial insemination you are responsible for making yourself pregnant. They will [say] you injected yourself in order

to be pregnant and they had nothing to do with the pregnancy. And also there is no intimacy, it's like science stuff. (29 years old)

Vaginal insemination, how sure will the health care workers be that you followed the correct procedures at home? (32 years old)

I only know about it [vaginal insemination] as a process performed on cows (other participants agree). (36 years old)

Timed unprotected intercourse information, perceptions, and challenges. Many women had heard of timed unprotected intercourse as a SC technique and knew that it should be used in conjunction with another method such as viral suppression in order to protect their partners when having unprotected sex during a woman's fertile days. However, some women were least interested in using timed unprotected intercourse and even distrustful of the method because of the perceived risks for their partner and risks for themselves because of other diseases or sexually transmitted infections.

I've heard that if my boyfriend is HIV negative, umm, we can go to the hospital and then they can introduce him into this medication and then monitor my cycle to see when I can fall pregnant. And then that is the time that we can have unprotected sex. (29 years old)

The timed unprotected intercourse has more risks ... in terms of infection and reinfection. And it's not really, really accurate. ... It's increasing the risk of infection. (34 years old)

Medical male circumcision information, perceptions, benefits and challenges. Many women had heard of medical male circumcision as a SC technique. However, despite some benefits, there were many challenges that were discussed. Noted benefits were that medical male circumcision was a well-known option and that the method was accessible across Botswana. Challenges focused around four main areas: male resistance to the method, rumors, a feeling that the method was unnatural, and that it had limited use because it could only be used by men who were not living with HIV. Women living with HIV noted that men were resistant to or refused medical male circumcision as an HIV prevention approach. Women said that medical male circumcision was rumored to lower sexual desire, arousal, and performance and that some men felt the practice was unnatural. Some women also felt the option was not ideal because it could only be used as an HIV prevention technique by men who were not living with HIV.

Most male's they are difficult when it comes to safe male circumcision. They refuse. ... yes it reduces chances of getting infected but most guys don't circumcise. (21 years old)

I once met someone who said that circumcision reduces the degree of a man's sensitivity. (37 years old)

This voluntary medical male circumcision method is doable, but now that it can only be done by males who are HIV-negative then it means that the HIV-positive males will be left out. There are certain clinics that perform the surgery, when you decide to do it you will definitely find it. (37 years old)

ART information, perceptions, benefits, and challenges. The use of ART for the purpose of viral suppression and the subsequent benefits it could offer for SC were well understood. However, women seemed least interested in using ART as a SC technique – mostly because it was a method that was already well known. Although they mentioned positive outcomes as a result of ART adherence, women did not explicitly discuss benefits of ART. Women however noted challenges that focused on two areas: treatment adherence and rumors. Women living with HIV reported that although ART was a well-known method, it was not always used consistently. Also, some women living with HIV reported hearing rumors about ART that worried them.

We have been told that the Treat all program is the best, because you start treatment with viral suppression, which means the virus will always be undetectable or low, then the chances that you can pass the virus on to your partner are very low, even when you are pregnant the chances of passing the virus on to the baby during birth are low. (48 years old)

Mostly they [women living with HIV] know this one [ART] ...But even though they know it, it's not like they use it. (39 years)

I heard a new rumor about ARVs that left me shocked; they say when you have been on ARVs for some time, when you reach a certain duration you die. (37 years)

General Influences on SC Method Use

Women living with HIV described a number of crosscutting issues that affect SC method uptake. We first describe facilitators to SC method uptake followed by a discussion of noted challenges. The involvement and participation of partners was a theme that came up as a facilitator and a possible barrier, and these will be discussed separately.

General SC facilitators. Women discussed facilitators to the use of SC methods and many of these highlight the important role of partners in SC decision-making and use. Important facilitators included the desire to have children, protecting partners from HIV transmission, male partner communication and support, and partner agreement with SC method choices. For example, women living with HIV are motivated by the ability to protect their partner from HIV infection and their desire to have children. In addition, partner disclosure and partner communication were very important. Women also highlighted the importance of choosing a SC method that their partner would agree to use. ART, PrEP, and vaginal insemination were mentioned as methods that partners might be open to trying. These findings highlight the importance of fully involving male partners in SC counseling and decision-making.

Some people have long lived together as couples one of them having HIV, wishing to have children, ... So if some of these [SC methods] were to be taught and people get to know about them, children will be born and people will enjoy their relationships. (36 years old)

When it comes to me being positive and my partner being negative, I have to be the one to protect him from being infected. ... I'd be so interested in using any method that we both agree on ... It's very, very important so that he won't get infected. (35 years old)

My partner wants a baby but I have been delaying it because I was afraid of my HIV status but since I know these methods now I know there are chances of having a baby and I can use these. (21 years old)

General SC challenges. Women also noted important challenges to greater SC uptake. Themes in this category include a lack of counseling and information about SC methods, not knowing where to seek SC services, concerns about stigma from healthcare providers, and unsupportive male partners. A key challenge was the lack of counseling about SC methods and a sense that SC methods are not well known or understood by women living with HIV. As a result of this, women also did not know whom to go to when they were in need of SC services. Some women also said that internalized stigma and anticipated stigma and discrimination from healthcare providers hinders women from seeking SC services. Women felt that internalized stigma and shame led some women not to disclose their HIV status. In addition, some women anticipated stigma and feared negative responses from providers when they wanted to have children. Women made a connection between overworked healthcare workers and long queues and the effect that these structural barriers can have on perpetuating stigma. In addition, while partner communication and agreement to use SC methods was mentioned as an important facilitator, a lack of partner support was seen as a key challenge to greater SC method use. Women mentioned a number of challenges to SC posed by their male partners including a refusal

to use SC methods that they felt were unnatural, a desire by men to have condomless sex when trying to get pregnant, and men not wanting to attend clinic visits where they could be counseled about SC.

We are never told about these methods. We just find ourselves pregnant that's when we are told that we people living with HIV are not supposed to fall pregnant many times. Honestly we are never taught about these methods. (37 years old)

Sometimes they [nurses] can say offensive things to you because they are swamped with work and long queues outside, and you will wonder how a person can say such hurtful words to you. (age unreported)

Tswana men will not [agree to use SC methods]. As a Setswana woman ... all you want is a child. ... Then you say let us do this to protect our baby, protect you as well my man. He will refuse.” (49 years old)

Discussion

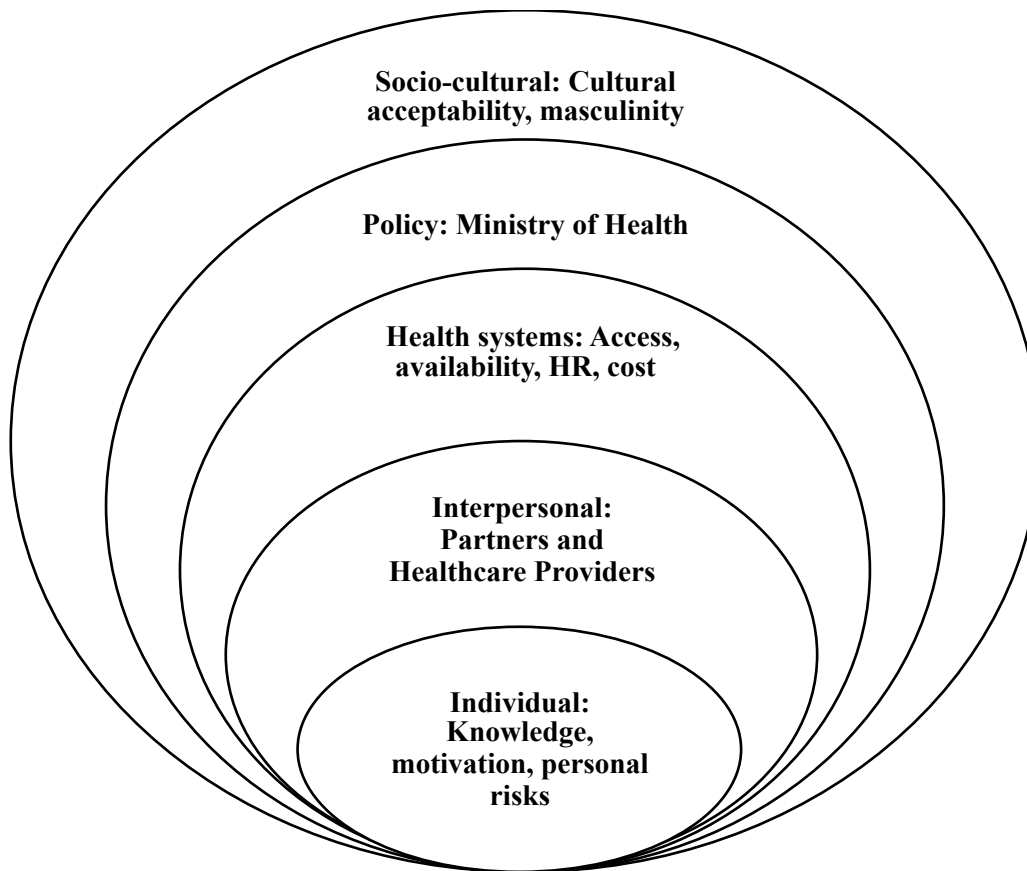
A portion of people living with HIV continue to desire childbearing and need to be assisted to make conception as safe as possible. Various low-cost SC methods can be made available to HIV-affected couples. However, in order to offer SC services in Botswana and similar contexts, it is imperative to understand perceptions about different methods and the benefits and challenges to use. In this qualitative study where we asked women living with HIV to compare SC methods, we found that although there was a lack of prior knowledge and

counseling about SC methods, interest in these strategies was high. In particular, women living with HIV were most interested in and wanted more information about PrEP and vaginal insemination for SC. Many challenges to greater uptake were noted and these included a lack of knowledge about a range of SC methods, limited partner support and communication, provider stigma, health systems barriers, current policies, and the cultural acceptability of methods. With this information, it is possible to develop interventions, service delivery models, and policies that are responsive to the needs and reflect the realities of women and HIV-affected couples who desire pregnancy.

A social ecological understanding of SC method use

Key factors influencing method perceptions reflect issues that need to be addressed at many levels, and can be conceptualized using the social ecological model (see Figure 3-1 below). At the individual level, knowledge of methods, personal motivation including the ability to protect partners from HIV transmission, and personal risks were mentioned. At the interpersonal level, various partner-level factors (including partner support and communication, relationship intimacy, and reducing partner transmission risks) and healthcare provider factors (including provider stigma) were highlighted. At the health systems level, women were concerned about access and availability, the cost of methods, and human resource shortages. Women also mentioned how Ministry of Health policy impacts access to SC methods. Finally, at the socio-cultural level, women focused on the cultural acceptability of SC methods and threats to masculinity. Therefore, SC is a complex issue that plays out at many levels. Interventions aimed at improving SC uptake need to address these multiple concerns to be successful and for SC uptake to become a common practice.

Figure 3-1: Social ecological model for Safer Conception in Botswana



General Considerations for SC Rollout in Botswana

Knowledge and counseling. Although a lack of prior knowledge and counseling about SC methods was mentioned as an important challenge to uptake, this did not seem to affect potential interest. This has also been seen in various sub-Saharan African settings where people living with HIV have voiced a desire to speak with healthcare providers about SC, despite low knowledge about SC methods (Kaida et al., 2014; Matthews et al., 2013, 2015; Mmeje et al., 2016; Ngure et al., 2014). Although most women in this study voiced a preference for PrEP and vaginal insemination, it is clear that one size will not fit all couples. Therefore, couples should be

offered a range of options including ART, timed unprotected intercourse, medical male circumcision, vaginal insemination and PrEP. This data can help tailor educational campaigns and trainings so that a range of SC methods are made routinely available to HIV-affected couples. In addition, demand creation campaigns that address individual level factors such as knowledge, motivation, and personal risks may help to increase uptake of methods.

Including partners. In discussing various SC methods, women living with HIV highlighted the important role of partners in SC method decision-making and use. These partner concerns play out at both the interpersonal and socio-cultural levels. Data from other sub-Saharan African countries has also highlighted the importance of partners in fertility-related desires and decisions, and around SC specifically (Bekker et al., 2011; Beyeza-Kashesya et al., 2010; Gutin et al., 2014; Matthews et al., 2013; Ngure et al., 2014; Schwartz et al., 2017; Wagner et al., 2016). Typically, when they happen, fertility related discussions tend to focus on women because it is women who most often seek care (Crankshaw et al., 2014; Goggin et al., 2015; Matthews et al., 2016). However, these discussions are also relevant for men, as men may be more, or just as likely, to desire childbearing (Cooper et al., 2009; Tesfaye et al., 2012).

In addition, most SC techniques require full partner participation and agreement for use. This highlights the important role of partner communication in both discussing pregnancy desires and then choosing a SC method, or a mix of methods, that couples are comfortable with. In this study, ART, PrEP, and vaginal insemination were mentioned as methods that partners might be open to using. Fully involving partners in couples-based SC counseling and decision-making is imperative for the success of any SC program. However, including men in reproductive services may be especially challenging since health services often focus on the reproductive needs of women (Mindry et al., 2017). Men may be especially reluctant to come with their partners to

healthcare services that are viewed as female environments (Mindry et al., 2017). Perhaps bearing this out, a SC implementation project in South Africa found that only 55% of women were ever accompanied by their partners for SC services and 45% always attended alone (Schwartz et al., 2017). Our results suggest that partner support and engagement and addressing concerns about masculinity will be critical to SC uptake in Botswana. Models that improve couples SC counseling and address cultural acceptability should see better outcomes.

Addressing stigma. Although Botswana has a long-standing HIV care program and has offered ART for over 15 years, women in this study described internalized stigma and anticipated stigma and discrimination from healthcare providers as challenges to greater SC uptake. Previous studies in Botswana have reported that stigma impacts HIV testing, disclosure, ART uptake, and adherence (Bene & Darkoh, 2014; Ehlers & Tshisuyi, 2015; Kip et al., 2009; Nam et al., 2008; Nthomang et al., 2009). The desire for childbearing can create a conflict for women living with HIV who wish to fulfill personal desires for children and cultural expectations of motherhood but also face strongly perceived community and healthcare provider disapproval associated with HIV and reproduction (Beyeza-Kashesya et al., 2010, 2009; Clouse et al., 2014; Gourlay et al., 2014). In particular, the anticipation of stigma from healthcare providers may inhibit communication about fertility desires and SC. Although Ministry of Health guidelines already support a reproductive rights approach to childbearing for people living with HIV (Botswana MOH & Masa, 2016), encouraging providers to routinely assess fertility desires and counseling about family planning as well as SC may signal to people living with HIV that childbearing is a topic that is not off limits.

Changing policy and guidelines. Women raised a number of issues that will require changes and guidance at the Ministry of Health policy level and that will impact the health

systems level. Currently, formal SC services are not being offered in public sector health centers in Botswana and government guidance on the appropriate package of services to offer people living with HIV who desire to be pregnant has been limited (Botswana MOH & Masa, 2016). As a first step, Ministry of Health documents will need to be updated to provide more guidance about a range of possible SC approaches. Once guidelines have been updated, providers will need training so they can correctly counsel and offer SC services to HIV-affected couples in a supportive environment where reproductive rights are protected. In our work with providers in Botswana and in research in Uganda and South Africa, providers have voiced a desire for such trainings so they can better support people living with HIV (Goggin et al., 2015; Patwa et al., 2019).

Considerations by SC Method

PrEP. The various SC methods that were explored in this study raise issues at multiple levels that need to be addressed and considered before their use can be scaled-up. PrEP is a method that is affected by factors at the individual, interpersonal, health system, policy, and socio-cultural levels. Despite low knowledge about PrEP, women living with HIV in this study had a positive response to the use of PrEP as a SC method. Speaking to their individual motivations for using the method, women liked that PrEP preserved intimacy and offered added prevention benefits for their partners. As has also been noted in Kenya, PrEP was seen as a method that was culturally acceptable because it did not threaten masculinity and was seen as more “natural” (Ngure et al., 2014). However, women also noted many potential barriers to use including access to PrEP, cost, knowing where to go for services, and concerns about proper

PrEP adherence by their partners. In particular, this concern about correct partner adherence has been noted elsewhere (Ngure et al., 2017).

Although the most recent Botswana HIV clinical care guidelines suggest that PrEP could be appropriate for discordant couples attempting to conceive, PrEP is not yet widely available in the public sector and little guidance has been offered on counseling couples on this strategy (Botswana MOH & Masa, 2016). Although PrEP can be accessed in the private sector, the associated cost is prohibitive for many. In order to make PrEP a viable SC option in Botswana and expand access beyond the private sector, we recommend that the Ministry of Health make PrEP available free of charge in the public sector for sero-discordant partners. Offering PrEP at public sector clinics across the country would likely address barriers related to access, availability, and cost and allow a wider segment of the population to benefit from this option. However, despite the perceived interest in PrEP for SC that has been noted here and elsewhere, interest and availability does not always translate into use (Ngure et al., 2017; Schwartz et al., 2017). An expanded PrEP rollout for discordant couples in Botswana would likely benefit from educational and demand creation campaigns. Encouragingly, women in this study were quick to grasp the importance of PrEP as a method that could protect their partners when they wanted to have children.

Vaginal insemination. Vaginal insemination was a method that was affected by factors at the individual, interpersonal, and socio-cultural levels. As has been noted in other contexts, some women in this study were particularly interested in vaginal insemination techniques, expressed a preference for methods that did not involve direct sexual contact, and ensured that their negative partners would not be at risk for HIV transmission (Ngure et al., 2017; Schwartz et al., 2017). This is not surprising as studies have found that people living with HIV are concerned

about transmitting HIV to their partners (Mindry et al., 2017; Ngure et al., 2014). However, as noted elsewhere, some important barriers to greater vaginal insemination uptake center around suspicion of artificial/assisted reproductive technologies, a feeling that insemination techniques are unnatural, the association between syringe insemination techniques and their use in cattle breeding, and concerns about cultural acceptability (Finocchario-Kessler et al., 2014; Ngure et al., 2014, 2017). With proper education about vaginal insemination techniques, it may be possible to dispel many of these concerns, especially since many women were interested in this technique despite limited knowledge of the method.

Timed unprotected intercourse and medical male circumcision. Although both timed unprotected intercourse and medical male circumcision were both SC methods that women were aware of in this study, neither method was particularly popular. This is similar to findings from a SC implementation project in South Africa where uptake of both timed unprotected intercourse and medical male circumcision were low compared to other methods (Schwartz et al., 2017). Also, as has been noted in South Africa, clients in this study were distrustful of condomless sex for fear of HIV transmission (Matthews et al., 2015; Schwartz et al., 2017). Women in Botswana may need far more counseling about the safety of combining timed unprotected intercourse with viral suppression before they see timed unprotected intercourse as an acceptable method.

Viral suppression with ART. Viral suppression with ART may be a particularly important SC area to target but factors at the individual and interpersonal levels must be addressed. Women in this study were especially aware of ART and its benefits for reducing partner transmission risks. However, women did not seem particularly motivated to use ART as a SC technique. This is in contrast to a study in South Africa where ART uptake for SC was high (Schwartz et al., 2017). In the era of treat all and U=U, some might wonder why SC techniques

even matter since if viral suppression is achieved, the risk of HIV transmission to partners should be eliminated. However, what this research highlights is that simply providing ART will not ensure that all couples are achieving the full benefits of treatment when trying to get pregnant. This is supported by findings from a South African SC clinic where it was found that many clients enrolling for SC services were not virally suppressed (Schwartz et al., 2017). While viral suppression may be the most sustainable and relevant long-term goal, participants in this study expressed apathy about ART use, making SC approaches to compliment ART use all the more applicable. In addition, even when only the woman living with HIV attends SC services, her engagement is still beneficial and can lead to ART initiation, improvements in treatment adherence, and education around other SC techniques that can help to prevent transmission to partners (Schwartz et al., 2017).

Strengths and Limitations

These study findings have strengths and limitations. A strength of this research was that local researchers, research assistants, and women living with HIV shaped this study so that local voices and perspectives guided study design and implementation. Prolonged engagement and collaboration with BONEPWA+, women living with HIV, and the local team of researchers further improve the trustworthiness of these results. In addition, peer debriefing led to rich discussions that helped refine and guide this research. The FGDs were conducted in predominantly urban and peri-urban areas. While it is likely that those in rural settings would express different sentiments, almost 70% of the population in Botswana is urban, making the experiences of this group especially meaningful for offering future programs. However, these findings are not generalizable to all contexts. Also, all participants were recruited from support

organizations for people living with HIV. A strength of this approach is that women living with HIV who were part of support groups likely felt more comfortable discussing personal attitudes in the group setting. However, recruiting from support organizations for people living with HIV may also have introduced potential biases. For example, support group members may be more knowledgeable about SC options because of their involvement in the group. These women who are already engaged with support services may also not be representative of all women living with HIV. The experiences and attitudes of support group members may represent a “best case scenario” with regard to SC because they may be more knowledgeable and feel more support around using SC methods, making their experiences less representative of women living with HIV in Botswana as a whole. While the study design would have benefitted from the inclusion of men or discordant couples, this study was conducted amongst women living with HIV. While we recognize that most decisions about SC will be made as a couple and that men have a great deal of say in childbearing decisions in many sub-Saharan African contexts, there were concerns about potential disclosure challenges when trying to recruit discordant partners. Also, mixed groups of men and women had the potential to prohibit women from freely speaking about SC and the challenges they face when trying to achieve their reproductive desires.

Conclusion

The lack of SC counseling and services is a significant gap in the current system of care for people living with HIV across much of sub-Saharan Africa and SC services are urgently needed by those who wish to conceive (Goggin et al., 2014). Despite the low cost and known benefits of SC methods, these techniques are not currently being offered as the standard of care in Botswana and many similar contexts. Dealing with fertility and childbearing should be a

routine part of HIV care. We should strive to normalize childbearing for people living with HIV and offer SC as part of a continuum of services that includes family planning counseling, contraceptive services, a range of SC options, and PMTCT. Women living with HIV in Botswana had limited knowledge about SC methods but were very interested in these techniques. Education and couples counseling will be needed in order to scale-up SC method use. Future research will need to focus on effective strategies for engaging male partners in SC counseling, addressing threats to traditional masculinity, and examining the cultural acceptability of methods. In addition, couples need to be offered multiple SC options since one size does not fit all. Offering couples a range of options so they can mix and match techniques and can weigh the challenges and benefits of each is key and can help couples engage in the least possible risk for the mother, her partner, and child.

Table 3-1: Benefits and challenges by safer conception method

Method	Benefits	Challenges
PrEP	<ol style="list-style-type: none"> 1. Preserves intimacy/physical connection 2. Makes conception feel more natural 3. Added transmission protection for partner 4. Easy to use 5. Forces couple communication 	<ol style="list-style-type: none"> 1. Availability– only in private sector 2. Cost – too expensive 3. Access – where to get PrEP 4. Ensuring partner adherence
Vaginal insemination	<ol style="list-style-type: none"> 1. No HIV transmission risk 2. Inexpensive 	<ol style="list-style-type: none"> 1. Method not culturally acceptable 2. Unnatural/ reduces intimacy 3. Concerns about using the technique at home without healthcare provider 4. Associations with cattle breeding
Timed unprotected intercourse		<ol style="list-style-type: none"> 1. HIV transmission risks for partner 2. Risks for other sexually transmitted infections
Medical male circumcision	<ol style="list-style-type: none"> 1. Accessible across Botswana 2. Well known method 3. Reduces chances of HIV transmission to partner 	<ol style="list-style-type: none"> 1. Male resistance/ refuse method 2. Rumors 3. Unnatural 4. Only for men not living with HIV
ART	<ol style="list-style-type: none"> 1. Method is well known 2. Viral suppression reduces transmission to one’s partner 	<ol style="list-style-type: none"> 1. Inconsistent ART adherence 2. Rumors

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CHAPTER 4

Multi-level Correlates to Target in Safer Conception Interventions in Botswana

Abstract

Many people living with HIV in sub-Saharan Africa are of reproductive age and in discordant relationships in which they desire to have children. Since between 20 to 59% of people living with HIV continue to desire childbearing and are of reproductive age, it seems plausible that some portion of new HIV transmissions are due to attempts to become pregnant. However, various safer conception (SC) methods that effectively reduce the risk of HIV transmission can be made available in resource-constrained settings. Using a cross-sectional survey, we examined correlates of SC information, motivation, behavioral skills, and self-efficacy among 356 women living with HIV in Botswana. While medical male circumcision was a method for SC that was well known (83%), and the use of ART for viral suppression was known by 64% of participants, most other methods, including vaginal insemination, PrEP, timed unprotected intercourse, and sperm washing were known by 40% of participants or less. These low method-specific information levels are concerning since almost half (48%) of the study participants reported that they were in sero-discordant or unknown status relationships and desired more children in the future. However, despite low information about specific SC methods, the mean scores for motivation and self-efficacy to use SC appear relatively high, indicating a demand for services. In addition, relationship and partner factors, reproductive autonomy, elements of stigma, and healthcare provider factors all affect SC information,

motivation, behavioral skills, and self-efficacy. Skills-based interventions aimed at increasing SC uptake would need to address deficits in information, motivation, behavioral skills, and self-efficacy in order to be successful.

Introduction

Botswana has one of the highest HIV rates in the world with an estimated prevalence of 23% among adults aged 15-49 years (UNAIDS, 2017). Data shows that between 25.1 – 29.7% of reproductive aged women (15-49 years) are living with HIV (UNAIDS, 2017). Also, studies in Botswana have suggested that while up to 70% of women know they are living with HIV before becoming pregnant (Government of Botswana, 2011; Mayondi et al., 2016), 43 to 50% of women report that their pregnancies were unintended (Doherty et al., 2018; Mayondi et al., 2016; National AIDS Coordinating Agency, 2014). While Botswana has exhibited strong political support to treat HIV and is already on track to reach UNAIDS 90-90-90 targets by 2020, the country has struggled to control new HIV infections (Gaolathe et al., 2017). Botswana has seen a 4% increase in new HIV infections from 2010 to 2017 and it seems plausible that some of these new infections are among reproductive-aged sero-discordant couples who desire childbearing (UNAIDS, 2018b). This highlights the need to promote safer conception approaches among HIV-affected couples who would like to become pregnant.

Various low-cost methods that effectively reduce the risk of HIV transmission can be made available in resource-constrained settings in order to achieve pregnancy safely. Methods such as timed unprotected intercourse and vaginal insemination are conception specific while male circumcision, viral suppression using antiretroviral therapy (ART), and pre-exposure prophylaxis (PrEP) are not conception specific methods, but all effectively reduce the risk of HIV transmission to uninfected partners (Auvert et al., 2005; Baeten et al., 2012; M. S. Cohen et

al., 2011; Donnell et al., 2010; Gray et al., 2007; Karim et al., 2010; Mmeje et al., 2012; Rodger et al., 2016; Vernazza et al., 2011). Studies in various sub-Saharan African countries have found that these methods are acceptable and have been used by HIV-affected couples who desire childbearing (Mmeje et al., 2015; Schwartz et al., 2017; Wagner et al., 2017). However, despite these various options, some people living with HIV who desire pregnancy do not use safer conception (SC) methods (Schwartz et al., 2017; Wagner et al., 2017).

Although there are options that can make conception safer, research suggests that both men and women living with HIV in sub-Saharan Africa generally have low information about SC strategies, thus limiting their uptake (Kaida et al., 2014; Matthews et al., 2013; Ngure et al., 2014; Schwartz et al., 2017; Wagner et al., 2016). However, studies have shown varying levels of awareness and information about specific SC methods. A recent study in Kenya found an awareness among people living with HIV of ART-based methods, sperm washing, self-insemination and timed unprotected intercourse, but limited understanding about how to track one's fertile days as well as a lack of specific information about sperm washing and self-insemination (Ngure et al., 2017). However, studies in South Africa have reported awareness about sperm washing but little or no awareness of PrEP, self insemination, or timed unprotected intercourse as SC options (Matthews et al., 2015; Schwartz et al., 2014). These findings suggest that SC knowledge varies by context, making country-specific data imperative for intervention development. Until fairly recently, there were no quantitative measures to assess SC information among people living with HIV in sub-Saharan Africa (Goggin et al., 2015; Woldetsadik et al., 2016). To date, no published peer-reviewed quantitative studies that could help guide the provision of SC services have reported on SC information in Botswana.

The use of SC methods may be particularly affected by partner dynamics. Data from various sub-Saharan African countries has highlighted the important influence of partners on fertility desires and on SC method uptake with male partners acting as both a facilitator and barrier to greater uptake (Bekker et al., 2011; Beyeza-Kashesya et al., 2010; Gutin et al., 2014; Matthews et al., 2013; Ngure et al., 2014; Schwartz et al., 2017; Wagner et al., 2016). While male involvement in SC has been low in existing SC programs (Schwartz et al., 2017), some studies have found that men report a willingness to attend clinics with female partners for SC services (West et al., 2016). Having support from one's intimate partner to use a SC method is critical and the perceived willingness of partners to use SC methods has been linked to greater motivation to use SC (Wagner et al., 2016). Teasing apart partner-related factors that can be targeted in interventions would likely help to improve SC method uptake.

Research has also established that interactions with healthcare providers are critical to SC uptake. SC strategies require communication between people living with HIV and their healthcare providers about fertility desires, pre-conception risks, and SC options. In a number of HIV-endemic countries in sub-Saharan Africa, it is also uncommon for providers to initiate conversations about fertility desires with people living with HIV of reproductive age (Beyeza-Kashesya et al., 2018; Goggin et al., 2015; Kawale et al., 2015; Matthews et al., 2015; West et al., 2016). However, despite the general lack of SC information during consultations, research has shown that people living with HIV are receptive to discussions with their providers about SC options (Kaida et al., 2014; Matthews et al., 2012, 2013, 2015; Ngure et al., 2014; West et al., 2016). Though even if providers initiated SC conversations, clients would need to feel comfortable discussing and informing providers about their fertility desires. This may be unlikely since research from various sub-Saharan African countries has found that people living

with HIV often face anticipated, perceived, and/or experienced stigma from healthcare providers when pregnant or trying to have children (Colvin et al., 2014; Ddumba-nyanzi et al., 2016; Goggin et al., 2014; Kawale et al., 2015; Saleem et al., 2016). These experiences of stigma can inhibit communication about fertility desires (Clouse et al., 2014; Goggin et al., 2015; Matthews & Mukherjee, 2009; Ong et al., 1995; Steiner, Dariotis, et al., 2013). Whether women living with HIV in Botswana desire SC discussions with healthcare providers, whether they experience any forms of stigma, and the possible effects of that stigma are unknown.

As noted above, there may be various reasons why women living with HIV do not often seek SC strategies and services including deficits or barriers to information, motivation, or behavioral skills for SC. Factors that influence the use of SC methods such as context, culture, and barriers that impact people living with HIV may occur at various levels including the individual, relationship, health center, community, or policy level (McLeroy, Bibeau, Steckler, & Glanz, 1988). A theoretical approach that is guided by the Information, Motivation, and Behavioral skills (IMB) model can help inform the understanding of how factors at multiple levels may affect information (e.g., knowledge of SC methods generally and specifically (Schwartz et al., 2017; Wagner et al., 2016), motivation to use SC (e.g., personal motivation which may be driven by fertility desires, partner willingness to use SC, unequal power dynamics in relationships, and community-level and healthcare provider stigma regarding childbearing (Beyeza-Kashesya et al., 2010; Colvin et al., 2014; Crankshaw et al., 2012; Upton & Dolan, 2011; Wagner et al., 2016; WHO, 2009), and behavioral skills (e.g., self-efficacy, pregnancy planning skills, speaking with providers about SC, optimizing health before attempting conception, and specific skills related to SC methods (Bekker et al., 2011; Fisher &

Fisher, 1992, 2000; Goggin et al., 2014; Matthews et al., 2012; J. S. Santelli et al., 2009; Woldetsadik et al., 2016).

In order to develop SC interventions that meet the needs of women living with HIV, it is necessary to understand the correlates of SC information, motivation, behavioral skills, and self-efficacy so as to identify areas and types of clients that can be targeted in order to promote SC. Few studies in the region, and none in Botswana, have quantitatively examined the correlates of information, motivation, behavioral skills, and self-efficacy for SC uptake (Wagner et al., 2016). To address this gap, we assessed the factors at various levels that influence these SC constructs among women living with HIV in Botswana.

Methods

Study Design and Setting

A quantitative, cross-sectional survey was administered between June and December 2018 in the greater Gaborone, Botswana area at six public sector health clinics including one hospital-based referral clinic, three clinics in low-income urban areas, and two clinics in middle-income peri-urban areas. All sites were chosen in consultation with the Gaborone District Health Management Team and selected because each had a high client volume, offered sexual and reproductive health services, and had a clinic where clients were accessing HIV care and treatment services. Each site provides HIV testing, ART, and offers family planning and contraceptive services.

Participants

Women were eligible for the study if they were (1) living with HIV, (2) between 18 – 40 years old, (3) reported a desire to have children/more children in the future or were unsure about

their childbearing plans, and (4) were not currently pregnant. Partner HIV status was not part of the eligibility criteria. Even though SC methods are especially relevant for sero-discordant couples, HIV-positive sero-concordant couples can still benefit from SC through reduced risks for superinfection and transmission of resistant virus. This study required a minimum of 352 non-duplicated participants. Power analyses were conducted using STATA (version 13.1, College Station, TX, USA). The power calculation was originally conducted *a priori* based on a given alpha level, power, and effect size based on an intention to use SC outcome. However, since there was a lack of variability in that outcome, it is not included here as a dependent variable. Based on effect size conventions in the social and behavioral sciences and previous studies, effect size was set to 0.3 (J. Cohen, 1988; Woldetsadik et al., 2016). The calculated sample size of 352 participants provides 80% power to detect a .25 standard deviation difference using a two-tailed significance test at $\alpha = 0.05$.

Recruitment took place using a combination of approaches. The first approach was to announce and briefly explain the study in waiting rooms. Interested clients were instructed to approach study staff members so they could be assessed for eligibility. The second approach was that potential participants were informed about the study by health center staff and if interested, were referred to a study research assistant. In all cases, research assistants screened women living with HIV for study eligibility and if they met the criteria, the research assistant explained the aims of the study. If the woman agreed to participate, the research assistant read her the consent form in either Setswana or English (based on the preference of the participant) and also gave her time to read the consent form to ensure that she understood what was being asked of her. Before beginning the questionnaire, all participants provided written informed consent.

Participants were all offered a snack and received money per Botswana ethics requirements (30 BWP, approximately 3 USD at the time of the study) to cover local transport costs.

Ethical approvals were obtained from the University of Michigan Health Sciences and Behavioral Sciences Institutional Review Board (Ann Arbor, Michigan), the University of Botswana Research Ethics Committee, Office of Research and Development (Gaborone, Botswana), the Health Research and Development Division of the Botswana Ministry of Health, and the Research and Ethics committee of the Princess Marina Hospital. Permission was also obtained from the coordinator of the Gaborone DHMT and from the heads of health facilities before recruitment of women living with HIV took place.

Procedures

Trained and experienced local research assistants administered paper-based questionnaires via face-to-face interviews. All local research assistants were fluent in English and Setswana, the local language. Research assistants administered surveys to ensure data consistency and account for varying literacy levels. Surveys were administered in private rooms on the ground of the clinics where the women living with HIV were recruited. Surveys took approximately 40 minutes to administer. All paper questionnaires were entered into a custom-designed REDCap data entry system. After data entry, paper questionnaires were stored in a locked file cabinet in Gaborone at the offices of the Botswana-UPenn Partnership (University of Botswana campus).

Measures

Measures focused on SC method information, motivation to use SC, behavioral skills to use SC, self-efficacy to use SC, SC fertility desires, reproductive autonomy, partner fertility desires, partner willingness to use SC, experience using SC services during a pregnancy, intention to use SC services, experiences with and perceptions of healthcare provider attitudes, HIV-related stigma (anticipated stigma, internalized childbearing stigma, and perceived community stigma related to childbearing), and contraceptive use. Many of the measures used had previously been validated in sub-Saharan African contexts. For newly developed measures, content validity was assessed by submitting items to content experts for review during survey development. The full survey with all items was pre-tested (n=10) in Botswana with women who met the study eligibility criteria, but were not included in the participant sample, in order to assess understanding and acceptability. Measures were adapted when necessary to suit the local context and to aid in comprehension.

Socio-demographic factors, relationship and partner characteristics, reproductive and HIV care history. Various socio-demographic factors including recruitment location, age, education level, and main source of income were collected. Relationship and partner characteristics included relationship status (e.g., married, cohabitating, in relationship but not cohabiting, etc.), self-reported partner HIV status, and whether they have children with the current primary partner. Reproductive and HIV care history included parity, length of time since HIV diagnosis, ART status (on treatment yes/no), self-reported viral suppression, prior prevention of mother-to-child transmission (PMTCT) use, and whether they had a pregnancy since learning their HIV-positive status.

SC method information. SC information was measured with an adapted SC method awareness scale (17-items) that was developed for use with people living with HIV in Uganda (Wagner et al., 2016). This scale assesses awareness of the availability of SC methods in general, conception-specific SC methods (such as sperm washing, manual self-insemination, and timed unprotected intercourse) and SC risk reduction strategies that are not conception-specific (circumcision, PrEP, ART adherence, etc.). We adapted the scale by adding two additional statements, one about ART adherence for viral suppression and one about medical male circumcision. Respondents were asked to select “True”, “False”, or “Don’t know” in response to a series of statements. An example statement is, “Only having unprotected sex during the few days each month when the woman is most fertile will help to limit the risk of HIV transmission to an uninfected partner.” The sum of correct responses was tabulated to create a total score with higher scores representing higher levels of SC information. This measure was administered prior to asking other SC-related questions so as to minimize responses being influenced to exposure to other measures.

Motivation to use SC methods. SC method motivation was measured using an adapted SC method motivation scale (4-items, original Cronbach’s alpha = 0.88, sample alpha = 0.88) that was originally developed for use with people living with HIV in Uganda (Wagner et al., 2016; Woldetsadik et al., 2016). This scale assesses a respondents’ level of commitment and readiness to engage in SC counseling or use a SC method (e.g. “I am ready to temporarily delay getting pregnant if it helps me have a child more safely”.) Item choices were on a 4-point scale ranging from 1 (strongly disagree) to 4 (strongly agree). Item scores were summed to create a total score with higher scores representing higher levels of motivation to use SC methods.

Behavioral skills and self-efficacy to use SC. Behavioral skills is composed of an individual's objective ability or skills and perceived self-efficacy concerning performance of the behavior. In this analysis, we chose to separate behavioral skills and self-efficacy so as to be able to tease apart the effects of both components. We developed a series of six questions (sample Cronbach's alpha = 0.67) to assess whether women living with HIV felt that they had used certain behavioral skills that might aid them in using SC methods (response options were yes/no) and a measure of their self-efficacy to engage in that specific skill (response options were from "I cannot do this at all" to "I can definitely do this"). Participants were asked the following questions that assessed whether they had used specific skills and not their perception of having skills: Have you ever had a discussion with a healthcare provider about preventing pregnancy? Have you ever had a discussion with a healthcare provider about wanting to become pregnant?; Have you ever had a discussion with a healthcare provider about how to make conception safer if you want to become pregnant in the future?; Have you and your current partner ever talked to each other about wanting to have children together?; Have you and your current partner ever talked about ways to make conception safer if you wanted to become pregnant in the future?; Have you ever taken steps to improve your health before becoming pregnant? Following each of these questions, women living with HIV were asked how certain they were that they engage in the skill that had just been described (for example, How certain are you that you could start discussions with a healthcare provider about preventing pregnancy?) (6 item scale, Cronbach's alpha = 0.86). Both sets of questions were combined into scales with higher values denoting 1) higher self-assessment of having the behavioral skills to engage in SC use and 2) higher self-efficacy to engage in the SC behavioral skills that were mentioned.

Prospective fertility desires. Prospective fertility desires were assessed by asking standard questions from previous research and Demographic and Health surveys (Kaida et al., 2009; Keogh et al., 2012; Schwartz, Rees, et al., 2012; Uganda Bureau of Statistics, 2012). Prospective fertility desires were assessed by asking participants: “Do you want to become pregnant within the next year?” Response options were on a 4-point Likert scale (Definitely not, Probably not, Probably yes, Definitely yes). Those who responded either “Definitely not” or “Probably not”, were then asked, “Do you want to have children, or more children, at any in the future?” Response options were yes/ no/ do not know. Women who responded “no” were considered to not desire future children. Women who said “yes” received a follow-up question that assessed the timing of when they desired future childbearing. This measure of prospective fertility desires was selected because it is the most common measure of this construct that is used in sub-Saharan African settings and has been used in countries with high HIV prevalence, such as Botswana. Women were also asked about whether their main partner would want them to become pregnant in the next year, how happy they would be if they became pregnant in the next year, and whether they had ever had an unintended pregnancy.

Reproductive Autonomy. An adapted version of the Reproductive Autonomy Scale was used (Upadhyay, Dworkin, Weitz, & Foster, 2014) to explore issues around interpersonal gender dynamics. This scale was informed by the theory of gender and power (Connell, 1987) and developed in the USA to assess whether women have the power to decide about and control issues related to contraceptive use, pregnancy, and childbearing. This scale accounts for multidimensional gender and power dynamics that affect sexual risk factors as well as the influence of significant peers and partners on contraceptive use.

The adapted scale had 12 items that addressed three domains: decision-making, freedom from coercion, and communication. The adapted decision-making sub-scale (three items, original Cronbach's alpha = 0.65, sample alpha = 0.91) asked women about which partner had the final say in different reproductive situations with the following response categories: my sexual partner (or someone else), both me and my sexual partner (or someone else) equally, or me. Participants were allowed to say someone else since parents, in-laws, or others may have the final say about reproductive decisions. An example question was, "Who has the most say about when you have a baby in your life?" One question from the original decision making sub-scale about abortion and adoption was dropped because abortion is illegal in Botswana and adoption is rare. The adapted freedom from coercion sub-scale (four items, original Cronbach's alpha = 0.82, sample alpha = 0.94) was on a 4-point scale ranging from 1 (strongly agree) to 4 (strongly disagree). An example question was, "My partner has pressured me to become pregnant". One question from the original freedom from coercion sub-scale was dropped because during pre-testing in Setswana, participants thought that two of the questions asking about the same thing. The communication sub-scale (five items, original Cronbach's alpha = 0.74, sample alpha = 0.94) was on a 4-point scale ranging from 1 (strongly agree) to 4 (strongly disagree). An example question was, "If I was worried about being pregnant or not being pregnant I could talk to my partner about it". Item scores were reverse coded as necessary and then summed to create a total score with higher scores indicating higher levels of reproductive autonomy.

Partner desires and perceived partner willingness to use SC. The respondent's perception of their partner's willingness to attend SC services or use a SC method was assessed using a scale developed in Uganda for use with people living with HIV (three items, original

Cronbach's alpha = 0.85, sample alpha = 0.92) (Wagner et al., 2016). Item choices were on a 5-point scale (1= no confidence to 5= high confidence). An example question was, "Your partner would be open to trying methods to reduce HIV transmission risks during conception". Item scores were summed to create a total score with higher scores representing higher levels of confidence in partner willingness to use SC. Respondents were also asked to rate their perception of their partner's desire for childbearing.

Previous SC services experiences. In addition, participants were asked seven questions about specific SC methods that they might have used while trying to get pregnant with their partner since learning that they were living with HIV. We used four questions (about timed unprotected intercourse, sperm washing, manual vaginal insemination, and PrEP) that were originally developed for use with people living with HIV in Uganda (Wagner et al., 2017). We also developed three additional questions (about viral suppression, viral load testing, and circumcision). Based on this information, we created a dichotomous variable (yes/no) that captured whether women said they had used any of the methods listed when trying to achieve pregnancy safely.

Intention to use SC methods. Since no studies had previously explored the issue of intention to use SC methods, we developed an item for the purposes of this research. The question asked, "If services were available in clinics to help make conception safer for HIV-affected couples who want to have children, how likely do you think you would be to use these services?" Response categories were: very unlikely, unlikely, likely, very likely, not sure/don't know. Responses options were dichotomized (Likely versus unlikely/don't know) and this was

used as a categorical variable.

Experiences / attitudes about healthcare providers. We developed two questions to measure interactions with healthcare providers around SC as existing measures only rated interactions with healthcare providers generally. Respondents indicated whether they would want to have SC discussions with a healthcare provider (response options yes/no/ not sure) and whom they believe should begin SC discussions (response options women living with HIV / healthcare providers / both women living with HIV and healthcare providers should start these conversations/ neither/ not sure). These were both used as categorical variables. In addition, we used a single item developed by researchers in Uganda to assess perceived provider childbearing stigma (Wagner et al., 2016). Respondents were asked to rate their level of agreement with the following statement, “Most HIV providers think that women living with HIV should not have children”. Response options were on a 5-point scale ranging from 1 (strongly disagree) to 5 (strongly agree) with higher scores indicating greater perceived provider childbearing stigma.

Anticipated HIV stigma. An adapted version of the HIV stigma measure was used (five items, Cronbach’s alpha = 0.89, sample alpha = 0.89) (Earnshaw et al., 2013) to explore the impact of anticipated HIV stigma. Response options were on a 5-point scale ranging from 1 (very unlikely) to 5 (very likely). An example question was, “Family members will avoid me”. Item scores were summed to create a total score with higher scores indicating greater anticipated stigma.

Internalized childbearing stigma. Internalized stigma towards childbearing was

measured with a scale that was developed for use among people living with HIV in Uganda (2 items, Cronbach's alpha = 0.72, sample alpha = 0.81) (Wagner et al., 2016). Respondents were asked to rate their agreement with two statements ("I feel ashamed for wanting to have a child" and "I feel selfish for wanting to have a child"). Response options were on a 5-point scale ranging from 1 (disagree strongly) to 5 (agree strongly). Item scores were summed to create a total score with higher scores representing higher internalized childbearing stigma.

Perceived community stigma. Perceived community stigma toward childbearing among people living with HIV was measured with a scale that was developed for use among people living with HIV in Uganda (three items, Cronbach's alpha = 0.94, sample alpha = 0.97) (Woldetsadik et al., 2016). This scale assesses a respondents' perception of community stigma surrounding pregnancy and childbearing for HIV-affected couples. Item choices were on a 5-point scale ranging from 1 (disagree strongly) to 5 (agree strongly). An example question was, "People in the community look down on people living with HIV who want to have a child". Item scores were summed to create a total score with higher scores representing higher perceived community-level stigma.

Contraceptive use. Participants were asked about their current contraceptive use by asking them to identify any methods that they were currently using to prevent pregnancy. Response options included the pill, injectable, implants, IUDs, vaginal ring, male and female condoms, male and female sterilization, and the lactational amenorrhea method. Participants could mention more than one method. Responses were dichotomized so that if participants said they used any of these methods to prevent pregnancy, they were categorized as currently using a

contraceptive method.

Data Analysis

All data were analyzed using Stata 13 (Stata Corporation, College Station, TX, USA). Descriptive univariate statistical analyses were conducted for basic characterization of both predictor and outcome variables and to assist in data cleaning. This process included evaluating all variables, checking distributions, confirming that all values were within range, and collapsing categories to increase the chance of a parsimonious model. The amount of missingness in the data was examined and found to be minimal (between 0 – 2.53%). Therefore, when building models, listwise deletion has been employed. We checked for possible collinearity of variables by running a correlation matrix. Some variables were not included in models because of concerns about multicollinearity. In addition, we examined whether there was clustering by clinic but found no collinearity above -0.37 between clinic and any of the outcome or predictor variables.

Bivariate comparisons were used to characterize the relationship between the main dependent and independent variables, as well as participant level factors (socio-demographics, reproductive/HIV history, fertility desires). Bivariate associations between participant characteristics and SC information, motivation, behavioral skills, and self-efficacy are described using Pearson's correlations, t-tests, and ANOVA, as appropriate.

We estimated four multiple linear regression models to examine factors associated with four continuous dependent variables (SC information, SC motivation, SC behavioral skills, and SC self-efficacy). Study variables were selected based on prior sexual and reproductive health/HIV and/or SC empirical/theoretical work in sub-Saharan African contexts as well as our prior

work in Botswana. The independent variables were selected to represent key demographic, relationship/partner, reproductive/HIV history, reproductive autonomy, fertility and SC intentions, interactions with healthcare providers, stigma, and SC covariates. While we did ask women living with HIV about SC method use, the focus of this analysis is on the precursors of SC method use: actual SC method use was low and is not modeled here.

In each model, variables were entered simultaneously. We examined one of the outcome variables (SC information, motivation, behavioral skills, or self-efficacy) in each model and the remaining constructs were included in the model as independent variables. All models included the same demographic, reproductive/HIV history, partner and relationship, reproductive autonomy, fertility and SC intention, interactions with healthcare providers, and stigma covariates. In addition, all models included clinic recruitment site as a control variable to account for potential differences in populations across recruitment sites. All categorical variables were dummy coded. Demographic variables included age (continuous), educational level (dummy coded with no formal education/ Pre-primary/ Primary used as the referent category), and main source of income (dummy coded with wage work used as the referent category). Partner and relationship variables included relationship status (dummy coded with no partner used as the referent category), perceived importance of children to one's partner (dummy coded with not important/ don't know as the referent category), and perceived partner willingness to use SC (continuous). Reproductive/HIV history variables included total number of pregnancies (continuous), current use of a family planning method (dummy coded with no method as the referent category), and being told you are currently virally suppressed by a healthcare provider (dummy coded with no viral suppression used as the referent category). Reproductive autonomy variables included relationship decision-making (continuous), freedom from coercion

(continuous), and relationship communication (continuous). Fertility and SC intention variables included desire for children in the future (dummy coded with no more children as the referent category), intention to use SC in the future (dummy coded with unlikely/ not sure/ don't know as the referent category), and use of SC at last pregnancy (dummy coded with no use of SC as the referent category). Interactions with healthcare provider variables included desiring discussions with healthcare providers about SC (dummy coded with no/not sure as the referent category) and who should start SC discussions (dummy coded with don't know/neither as the referent category). Stigma variables included internalized childbearing stigma (continuous), anticipated stigma (continuous), and perceived community stigma around childbearing (continuous).

Results

Sample characteristics

Three hundred fifty-six (n=356) women living with HIV were enrolled in this study. Of 391 eligible women living with HIV that were screened, 33 (8%) did not take part in the study, most commonly citing time constraints (data not shown). The characteristics of the sample and descriptors of SC information, motivation, behavioral skills, and self-efficacy can be found in Table 4-1. The mean age of participants was 33.63 years and over 80% reported secondary or higher level education. Few women (10.67%) were married while most reported cohabiting (35%) or being in a relationship but not cohabiting (33%). Of those who reported having a current partner (n=280), 90% (n=252) said they knew the HIV status of their partner and 48% of those who said they knew their partner's status (n=120) said they were in discordant or unknown status relationships. Almost all women (96%) indicated that their partner was aware that they were living with HIV. Women had been living with HIV for a mean of 8.5 years, almost all

women were taking ART, but only 53% reported that a healthcare provider has told them that they are currently virally suppressed. Almost 50% of the sample had been pregnant since being diagnosed with HIV and over half had ever used PMTCT.

SC information

Table 4-2 presents the level of information measured by each item in the SC method awareness scale, and the proportion of participants correctly answering each item. The overall sample mean for the scale (range of 0 to 17) was 11.01 (SD = 2.78) and the median was 11. Awareness of specific SC methods was generally low, with the exception of male circumcision (83%). After male circumcision, the greatest proportion of participants were aware that viral suppression could be used by a person living with HIV to reduce the chance of transmitting HIV to a negative partner (64%). Awareness of vaginal insemination techniques, PrEP, timed unprotected intercourse, and sperm washing were all markedly lower than awareness of male circumcision or viral suppression with 40% or less of participants aware of these methods.

Bivariate correlates of SC information, motivation, behavioral skills, and self-efficacy

Table 4-3 lists the results of bivariate analyses. Women with higher levels of motivation, behavioral skills, and self-efficacy around SC also had higher SC information levels. Women with higher levels of SC information, behavioral skills, and self-efficacy also had higher motivation around SC. Those who reported higher levels of information, motivation, and self-efficacy had higher behavioral skills to discuss SC with providers and partners and to optimize their health before trying to become pregnant. Last, women who reported higher levels of

information, motivation, and behavioral skills around SC had higher self-efficacy to discuss SC with providers and partners and to optimize their health prior to pregnancy.

Various SC constructs were correlated with demographic, reproductive, and HIV history characteristics. Women who had higher levels of education, whose main source of income was their spouse compared to doing wage work or casual work, and had higher parity, were motivated to use SC. In addition, women who were older, had been pregnant since their HIV diagnosis, and had ever used PMTCT had behavioral skills to use SC. Being currently virally suppressed and the recruitment site were also positively correlated with both behavioral skills and self-efficacy. Finally, women who reported current use of a family planning method had lower SC information, behavioral skills, and self-efficacy.

Several relationship and partner characteristics were associated with SC constructs. Women who were married or cohabiting had higher behavioral skills, while women who were cohabiting or in relationship but not cohabiting reported higher SC self-efficacy. Women who reported knowing their partner's HIV status and having a partner who was either living with HIV (sero-concordant) or not living with HIV (sero-discordant) had higher levels of SC behavioral skills and self-efficacy. In addition, women who had talked with their partners about SC before pregnancy and had higher levels of perceived partner willingness to use SC had higher levels of SC motivation, behavioral skills, and self-efficacy. Perceived partner willingness to use SC was also positively correlated with SC information while talking to one's partner about SC before pregnancy was positively correlated with behavioral skills. Also, women who had disclosed their HIV status to their partner and believed that having more children was important to their partners had higher SC information, behavioral skills, and self-efficacy. Various components of reproductive autonomy were correlated with SC constructs. Having more decision-making power

in relationships was negatively correlated with SC motivation and behavioral skills. However, those who reported less coercion in their relationships and greater partner communication had higher SC information, motivation, behavioral skills, and self-efficacy.

Fertility and SC intention variables were also associated with SC constructs. Desiring more children in the future and more time until a next birth was positively correlated with motivation and behavioral skills around SC. Believing that one's partner desires a pregnancy within the next year and having used any SC method at last pregnancy was also positively correlated with behavioral skills. However, women who said they would be likely to use SC services if they were available had lower levels of SC information, motivation, behavioral skills, and self-efficacy.

Various forms of stigma were correlated with SC constructs. Women who anticipated stigma from family members and healthcare providers had lower levels of SC information, motivation, and self-efficacy. Reporting higher levels of perceived community stigma surrounding pregnancy and childbearing amongst people living with HIV was positively correlated with SC motivation and self-efficacy but negatively correlated with SC information levels. Believing that providers hold negative views about people living with HIV having children was positively correlated with self-efficacy around SC. Finally, women who had higher levels of internalized stigma towards childbearing had lower levels of all the outcomes of interest.

Interactions with healthcare providers were also important bivariate correlates. Women who said they would want to have discussions about SC with providers had lower levels of SC information, motivation, behavioral skills, and self-efficacy. However, thinking that both providers and women living with HIV should start SC discussions was positively correlated with

SC information and behavioral skills while thinking that women living with HIV, providers, or both should start SC discussions was correlated with motivation and self-efficacy. Last, women who had spoken with a healthcare provider about their pregnancy desires before a pregnancy and those who had discussions with a provider about SC before pregnancy had higher SC behavioral skills.

Multivariate correlates of SC information, motivation, behavioral skills, and self-efficacy

Model 1 (SC information). The model was significant for SC information ($F_{(35,296)} = 1.80, p = 0.005$), with an R-square value of .176. In the model, self-efficacy and level of education emerged as significant correlates of SC information. Every unit increase in self-efficacy corresponded to a .187-unit increase in SC information ($t_{(332)} = 2.25, p = 0.025$). Reporting a level of education above secondary level was associated with a 1.23 unit increase in SC information ($t_{(332)} = 2.18, p = 0.030$) (see Table 4-4).

Model 2 (SC motivation). The model was significant for SC motivation ($F_{(35,296)} = 4.54, p < 0.001$), with an R-square value of .350. In the model, self-efficacy, level of education, main source of income, decision-making ability, desiring SC discussions with providers, believing that women living with HIV, healthcare providers, or both should start SC discussions, perceived community stigma around childbearing, and previous use of any SC method emerged as significant correlates of SC motivation. Every unit increase in self-efficacy corresponded to a .130 unit increase in SC motivation ($t_{(332)} = 3.00, p = 0.003$). Secondary level of education was associated with a 0.495 unit decrease in SC motivation ($t_{(332)} = -2.09, p = 0.037$). Identifying one's spouse or partner as their primary source of income was associated with a 1.057 unit decrease in SC motivation ($t_{(332)} = -3.14, p = 0.002$). Every unit increase in decision-making

ability was associated with a 0.261 unit decrease in SC motivation ($t_{(332)} = -4.04, p < 0.001$). Wanting to have SC discussions with providers was associated with a 0.750 unit increase in SC motivation ($t_{(332)} = 2.80, p = 0.005$). Believing that women living with HIV should start SC discussions was associated with a .868 unit increase in SC motivation ($t_{(332)} = 2.49, p = 0.013$). Believing that healthcare providers should start SC discussions was associated with a 1.215 unit increase in SC motivation ($t_{(332)} = 3.56, p < 0.001$). Believing that women living with HIV and healthcare providers should start SC discussions was associated with a .772 unit increase in SC motivation ($t_{(332)} = 2.30, p = 0.022$). Every unit increase in perceived community stigma around childbearing was associated with a .047 unit increase in SC motivation ($t_{(332)} = 2.13, p = 0.034$). Finally, previous use of any SC method was associated with a 0.717 unit increase in SC motivation ($t_{(332)} = 2.67, p = 0.008$) (see Table 4-4).

Model 3 (SC behavioral skills). The model was significant for SC behavioral skills ($F_{(35,296)} = 6.47, p < 0.001$), with an R-square value of .434. In the model, self-efficacy, relationship status, believing one's partner thinks it is important to have children/more children anticipated stigma, and previous use of any SC method emerged as significant correlates of SC behavioral skills. Every unit increase in self-efficacy corresponded to a .222 unit increase in SC behavioral skills ($t_{(332)} = 5.56, p < 0.001$). Being in a relationship but not cohabiting was associated with a -0.768 unit decrease in SC behavioral skills ($t_{(332)} = -2.79, p = 0.006$). Believing that one's partner thinks it is important to have children/ more children was associated with a 0.763 unit increase in SC behavioral skills ($t_{(332)} = 3.37, p = 0.001$). Every unit increase in anticipated stigma was associated with a .071 unit increase in SC behavioral skills ($t_{(332)} = 2.43, p = 0.015$). Finally, previous use of any SC method was associated with a 1.085 unit increase in SC behavioral skills ($t_{(332)} = 4.30, p < 0.001$) (see Table 4-4).

Model 4 (SC self-efficacy). The model was significant for SC self-efficacy ($F_{(35,296)} = 14.34, p < 0.001$), with an R-square value of .629. In the model, recruitment site, SC knowledge, SC motivation, SC behavioral skills, believing one's partner thinks it is important to have children/more children, perceived partner willingness to use SC methods, freedom from coercion in relationships, intentions to use SC methods, desiring discussions with healthcare providers about SC, believing that women living with HIV should start SC discussions, internalized childbearing stigma, and current use of a family planning method emerged as significant correlates of SC self-efficacy. Being recruited from a peri-urban recruitment site was associated with a 0.755 unit increase in SC self-efficacy ($t_{(332)} = 2.00, p = 0.047$). Every unit increase in SC information corresponded to a .090 unit increase in SC self-efficacy ($t_{(332)} = 2.25, p = 0.025$). Every unit increase in SC motivation corresponded to a .227 unit increase in SC self-efficacy ($t_{(332)} = 3.00, p = 0.003$). Every unit increase in SC behavioral skills corresponded to a .425 unit increase in SC self-efficacy ($t_{(332)} = 5.56, p < 0.001$). Believing that one's partner thinks it is important to have children/ more children was associated with a -0.781 unit decrease in SC behavioral skills ($t_{(332)} = -2.47, p = 0.014$). Every unit increase in perceived partner willingness to use SC methods corresponded to a .186 unit increase in SC self-efficacy ($t_{(332)} = 4.83, p < 0.001$). Every unit increase in freedom from coercion in relationships corresponded to a .088 unit increase in SC self-efficacy ($t_{(332)} = 2.07, p = 0.039$). Intentions to use SC methods in the future were associated with a 1.343 unit increase in SC behavioral skills ($t_{(332)} = 2.95, p = 0.003$). Desiring discussions with healthcare providers about SC was associated with a 1.070 unit increase in SC behavioral skills ($t_{(332)} = 3.03, p = 0.003$). Believing that women living with HIV should start SC discussions was associated with a .962 unit increase in SC self-efficacy ($t_{(332)} = 2.08, p = 0.038$). Every unit increase in internalized childbearing stigma was associated with a -

.361 unit decrease in SC self-efficacy ($t_{(332)} = -2.98, p = 0.003$). Finally, current use of a family planning method was associated with a 1.391 unit increase in SC motivation ($t_{(332)} = 2.45, p = 0.015$) (see Table 4-4).

Discussion

In this study amongst women living with HIV with fertility intentions in Botswana, we found that information levels about specific SC methods varied. While medical male circumcision was a method for SC that was well known (83%), and the use of ART for viral suppression was known by 64% of participants, most other methods, including vaginal insemination, PrEP, timed unprotected intercourse, and sperm washing were known by 40% of participants or less. The low method-specific information levels noted here are concerning since almost half (48%) of the study participants reported that they were in sero-discordant or unknown status relationships and desired more children in the future. SC information is especially relevant for this group. However, despite low information about specific SC methods, the mean scores for motivation and self-efficacy to use SC appear relatively high, indicating a demand for services. Mean behavioral skills scores appear more moderate (mean of 3, scale max of 6) suggesting that despite their motivation and confidence in using SC, women living with HIV would need help to improve their skills in order to use SC. In addition, our data reveal that relationship and partner factors, reproductive autonomy, elements of stigma, and healthcare provider factors all affect SC information, motivation, behavioral skills, and self-efficacy. Skills-based interventions aimed at increasing SC uptake would need to address deficits in information, motivation, behavioral skills, and self-efficacy in order to be successful. Although the IMB models served as the framework for understanding SC in this context, the discussions is

organized to examine how IMB affects different types of factors before discussing implications for intervention development.

Demographic factors

Two demographic variables, level of education and main source of income were associated with information and motivation. Higher levels of education (above secondary school) were positively associated with SC information while having a secondary level education was negatively associated with SC motivation scores. It is not surprising that educational levels above secondary were positively associated with SC information levels, as level of education and sexual and reproductive health outcomes have been shown to be associated (Elul et al., 2009; Mayondi et al., 2016). Having one's spouse or partner be their primary source of income was associated with lower SC motivation scores. This highlights that when women are financially dependent on men, they may feel less motivated or lack the power to make reproductive decisions within their relationships (Phaladze & Tlou, 2006; Schaan et al., 2016). Therefore, attempting to include partners in SC counseling will be critical to uptake for some women as partners have an important impact on motivation to use SC.

Relationship and partner factors

Relationship and partner characteristics emerged as important components of SC behavioral skills and self-efficacy. Being in a relationship but not cohabiting was negatively associated with SC behavioral skills. Women living with HIV who are not cohabiting with their partners may be in relationships where there is lower commitment. As a result, it is possible that these women have not felt the need to develop the behavioral skills to implement SC. However,

believing that it is important to one's partners to have children was positively associated with SC behavioral skills but negatively associated with self-efficacy. This is a surprising finding since other research has noted that having confidence in one's partners' willingness to use SC was associated with higher SC self-efficacy (Wagner et al., 2016). These findings suggest that women with partners who value childbearing may believe they have the skills to implement SC techniques but that they have deficits in self-efficacy. Therefore, interventions can focus on improving the self-efficacy of these women and reinforcing behavioral skills.

While research shows that women may attend SC services alone, and should be offered services whether they arrive with their partner or not, this and other research highlights the importance of partner-level factors on SC awareness, motivation, self-efficacy, and uptake (Crankshaw et al., 2014; Patwa et al., 2019; Schwartz et al., 2017; Wagner et al., 2016). Almost 50% of the women in this study were in sero-discordant or unknown status relationships and SC is especially relevant for these couples since they must address concerns about both horizontal and vertical transmission when trying to have children (Saleem, Narasimhan, Denison, & Kennedy, 2017). In addition, since many SC methods require full partner participation, there is a need to focus SC counseling on couples. Identifying the right place to offer SC counseling so as to maximize uptake by couples is challenging. While some guidelines and research have suggested integrating SC counseling within family planning, antenatal, or postnatal care services, these services are often seen as female spheres and few men attend (Mindry et al., 2017; Patwa et al., 2019). Leveraging existing services that target couples, such as integrating SC counseling and services within couples' voluntary HIV counseling and testing, partner disclosure programs, or STI treatment services, may help to reach more couples with SC counseling and methods. In particular, couples' voluntary HIV counseling and testing may be a useful place for SC services

as couples testing has been associated with reductions in HIV incidence, STIs, and unplanned pregnancies among sero-discordant couples (Allen et al., 2003; Wall et al., 2017). Existing couples-based interventions that provide the opportunity to gain information, behavioral skills, and discuss issues that require agreement among partners may be the ideal place to discuss SC.

Another component of the interpersonal partner relationship that may affect SC uptake is reproductive autonomy in matters of pregnancy and childbearing. Gendered power dynamics within relationships can affect the uptake of various sexual and reproductive health services and a woman's ability to achieve her reproductive goals is affected by her sexual partner (Upadhyay et al., 2014). The literature suggests that those with greater reproductive autonomy should have a greater ability to use SC methods and greater self-efficacy for using SC methods (Upadhyay et al., 2014). In this study, those with greater decision-making ability had lower motivation to use SC. Those who report greater decision-making ability within their relationships may have lower motivation to use SC because decisions around SC and having children are seen as mutual decisions that require input from both partners. This finding however is in contrast to research from Uganda where greater sexual decision-making power in relationships was associated with greater SC self-efficacy and method use (Wagner et al., 2017, 2016). In addition, those who report freedom from coercion in their relationships have more confidence in their abilities around SC. Coercion in relationships has been associated with unintended pregnancy and so those who experience less coercion are more likely to feel that they can control matters related to pregnancy and SC (Upadhyay et al., 2014). Interventions to improve SC uptake should target couples as a way to improve motivation to use SC and should identify women who report coercion within their relationships, as they will need support to improve self-efficacy around using SC.

Healthcare provider factors

Patient-provider communication is another area that will need to be addressed in interventions. Wanting to have SC discussions with providers was positively associated with SC motivation and self-efficacy. Studies in other sub-Saharan countries have found that people living with HIV desire to have discussions about SC with their providers (Kaida et al., 2014; Matthews et al., 2015). Those who are ready to have such discussions may be ideal targets for SC services because of they are already motivated and confident in their abilities. Believing that either women living with HIV, healthcare providers, or both groups should start SC discussions was positively associated with SC motivation while believing that women living with HIV should start SC discussions was positively associated with self-efficacy. The literature suggests that providers rarely start fertility or SC discussions with people living with HIV of reproductive age (Goggin et al., 2015, 2014; Kawale et al., 2015; Matthews et al., 2014, 2015; West et al., 2016). While women who are confident in their ability to use SC may feel comfortable starting SC discussions, many women will not be. Our results suggest that even women with the motivation to use SC might like to have providers start SC discussions. Therefore, while women living with HIV may start these discussions with their providers, they may be more comfortable if such discussions were provider initiated (Beyeza-Kashesya et al., 2018; Goggin et al., 2015; West et al., 2016). While interventions for women could focus on building the self-efficacy to start SC discussions, it may be more effective to concentrate on interventions for providers. As research suggests that providers often need and desire additional training on SC (Crankshaw et al., 2014; Goggin et al., 2015; Matthews et al., 2016; Patwa et al., 2019), interventions could train providers on SC strategies, how to routinely assess childbearing desires, and best practices for counseling women about a range of SC techniques.

The effects of stigma

Women living with HIV may be reticent to start SC discussions with their providers because of concerns about stigma. Our research suggests that SC information, motivation, behavioral skills, and self-efficacy are affected by different forms of stigma. Internalized childbearing stigma was negatively associated with SC information and self-efficacy. Internalized HIV stigma is associated with low implementation of HIV-related behaviors (Earnshaw et al., 2013) and one would need information and self-efficacy to implement a SC technique. Anticipated stigma from family members and healthcare providers was positively associated with SC behavioral skills. This finding suggests that those who anticipate stigma may be avoiding healthcare interactions where they expect to be treated poorly but are instead channeling their anticipation of stigma towards arming themselves with skills to be able to address SC on their own. Data from Uganda support this as perceived provider stigma of childbearing was associated with use of timed unprotected intercourse by couples affected by HIV (Wagner et al., 2017). Perceived community stigma around childbearing was negatively associated with SC information and motivation. This is not surprising as research suggests that people living with HIV perceive strong community disapproval associated with HIV and reproduction (Beyeza-Kashesya et al., 2010, 2009; Cooper et al., 2007; Myer et al., 2006).

Normalizing discussions about pregnancy desires and SC for people living with HIV and routinely assessing these needs at HIV care visits may help address these various types of stigma and signal to people living with HIV that childbearing is a normal part of life that can be discussed within HIV care settings. Interventions for providers could speak to this. Additionally, it may be possible to see improvements in SC information, motivation, and self-efficacy if

interventions for women living with HIV address internalized childbearing stigma as well as perceived community stigma around childbearing.

Family planning method use and intentions to use SC

Finally, current use of a family planning method and intentions to use SC methods were both positively associated with SC self-efficacy. Successfully using a family planning method likely gives women confidence in their ability to utilize other reproductive health services. Women who use family planning methods may also be more likely to have discussed pregnancy intentions with their partners and providers, the same skills that they would need to use a SC method. Findings from Uganda support this as having discussions about childbearing desires were associated with SC method awareness, which is a necessary prerequisite to SC method use (Wagner et al., 2016). In addition, self-efficacy may be key to having intentions to use SC services. While intentions do not always translate into use, this data and research from Uganda suggests that self-efficacy would be an important component of SC method uptake (Wagner et al., 2016). Women who have used family planning methods and show an intention to use SC services are likely well placed to use SC services and could be targeted in SC interventions when they voice a desire for childbearing.

Implications for intervention development

Information, motivation, behavioral skills, and self-efficacy are likely to be important determinants of SC method use. Understanding the factors that affect these constructs can help to target interventions so that deficits in information, motivation, behavioral skills, and self-efficacy can be addressed. Participants in this study had information about some SC methods, but lacked

information about others. An intervention aimed at improving SC uptake would need to educate people living with HIV about a range of SC techniques as some methods were known by few participants. In addition, the main construct that seems to be affecting SC information is stigma, both internalized childbearing stigma and perceived community stigma around childbearing. Trying to address these forms of stigma by educating people living with HIV about their reproductive rights may help to see further improvements in information.

Motivation to use SC was associated with stigma and decision-making ability within relationships. Like information, motivation to use SC was also being negatively affected by perceived community stigma surrounding childbearing. Trying to address the stigma that people living with HIV feel may lead to more motivation to use SC. Motivation to use SC was also negatively associated with decision-making ability within relationships. While women may have personal motivation to use SC and feel like they can generally make reproductive decisions within their relationships, SC appears to be different because it often requires partner agreement and participation. As noted above, this highlights the need to address motivation to use SC within couples. This may be a limitation of the IMB model for understanding this topic since IMB assumes an individual locus of control while SC appears to be influenced by factors that need to be addressed within couples.

In the IMB model, behavioral skills is made up of objective abilities and skills and perceived self-efficacy. Our data suggests that being in relationships but not cohabiting is negatively associated with skills. While it is not possible to change the type of relationships that people are in, it may make sense for interventions to focus on building skills to use SC no matter what the relationship status is. Internalized childbearing stigma was negatively associated with self-efficacy, showing again the importance of addressing this structural barrier when trying to

develop interventions to improve SC uptake. Finally, thinking that one's partner desires children in the future was negatively associated with self-efficacy. It may be that if you think your partner desires children, but, for example, you have limited information about SC methods, you feel less confident in your ability to use SC. Interventions can focus on building self-efficacy by educating women about SC methods, helping them develop the skills to use specific methods, and trying to address couple-level motivation to use SC.

Strengths and Limitations

This study has strengths and limitations. This is the first quantitative study from Botswana to address SC and the findings highlight areas that are likely important to SC uptake. The large sample size and the fact that all study recruitment sites were at public sector clinics suggest that the results should be representative of women living with HIV accessing care in the public sector. Many of the measures used were developed in sub-Saharan Africa, specifically to assess issues related to SC. This supports the applicability of these findings for this context. In addition, surveys were pretested in Setswana to ensure comprehension and local relevance. Also, local research assistants who were not healthcare providers at the recruitment clinics administered surveys, thus limiting response and social desirability bias.

Although this study is the first to our knowledge to assess correlates of SC that could be targeted in interventions, it is not without limitations. First, the cross-sectional nature of the study limits the ability to draw conclusions about causal relationships between the variables. However, since this is the first survey of SC conducted in Botswana, the results are still useful for intervention development. Another limitation is that the study was conducted at urban and peri-urban sites, thus limiting the generalizability of the results to rural locations. While parts of

Botswana are rural, the country is rapidly becoming more urban with 69% of the population residing in urban areas in 2018 (United Nations Department of Economic and Social Affairs/Population Division, 2018), particularly in the south of the country, where this study took place.

This study was only conducted amongst women living with HIV in HIV care. While the results are not generalizable to those not accessing care, few people in need of HIV care are not accessing it as 84% of those in need of treatment in Botswana are reported to be accessing ART through the national ART program (UNAIDS, 2017). It is possible that those who are accessing care have greater familiarity with SC methods, thus our results may present the best-case scenario in terms of SC information. However, since there are no formal SC services that are currently offered in Botswana in the public sector, levels of information, motivation, behavioral skills, and self-efficacy to use SC methods are based on limited exposure to SC methods.

The study results are also not generalizable to men living with HIV. While we readily acknowledged that pregnancy decisions are made in couples and that male partners have a strong impact on fertility and SC decisions, we did not survey men in this study since far more women access HIV care and sexual and reproductive health services in this context. However, research on the feasibility, acceptability, and use on SC methods when the male partner is the HIV-affected partner is available from sub-Saharan African contexts (Khidir et al., 2018; Mmeje et al., 2015; Schwartz et al., 2017). Finally, although SC methods are particularly relevant for discordant couples, partner HIV status was not part of the eligibility criteria for this study as both HIV sero-concordant and discordant couples can benefit from SC services.

Conclusion

These findings suggest that certain types of women may be ideal candidates for SC counseling. Specifically those who have used family planning methods, are in relationships with partners who value childbearing, have intentions to use SC services, or are ready to have discussions with healthcare providers about SC would likely be early adopters of SC interventions because of their high motivation and self-efficacy. However, SC information and behavioral skills would need to be targeted for improvement in interventions.

These findings also highlight the importance of making SC counseling a routine part of HIV care and including partners in SC counseling. Normalizing discussions about pregnancy desires and SC for people living with HIV and regularly assessing these needs at HIV care visits may help address concerns about stigma and facilitate provider-initiated discussions. Current HIV guidelines offer healthcare providers limited guidance on how to support clients in need of SC methods. Providers will need training interventions that teach them how to counsel women about a range of SC techniques. Our prior qualitative research in Botswana suggests that providers would like to know how to better support couples who want children and are receptive to receiving training. Including partners in SC counseling will also be critical to the uptake of SC methods as these decisions happen between couples and often require partner participation. Offering SC counseling in spaces that are not seen as woman-dominated spheres and trying to integrate SC within existing couples-based services may help draw discordant couples who desire these services.

SC methods are an important HIV prevention strategy that can help couples to reduce incident HIV cases during conception while also supporting the reproductive rights of people living with HIV to achieve their desired family size. SC continues to be a relevant intervention because while viral suppression should address concerns about transmission, routine viral load

testing is absent in many sub-Saharan contexts and adherence is not always adequate to achieve suppression (Keiser et al., 2011; Mills, Nachega, Bangsberg, et al., 2006; UNAIDS, 2017). In addition, data from Botswana recently suggested an elevated risk of fetal neural tube defects in women with preconception exposure to the antiretroviral drug Dolutegravir (Zash, Jacobson, et al., 2018; Zash, Makhema, et al., 2018). This highlights the need for pre-conception counseling and pregnancy planning in order to protect the developing fetus from possibly teratogenic regimens. Therefore, along with ART, a range of SC techniques should be offered to HIV affected couples as part of a comprehensive continuum of care.

Table 4-1: Characteristics of the sample of women living with HIV (n=356)

Characteristic	Mean (SD) / Frequency (%)
Demographics	
Recruitment Location	
Hospital clinic	126 (35.4)
Peri-urban clinics	40 (11.2)
Urban clinics	190 (53.4)
Age - Mean	33.63 (5.6)
Education	
No formal education/ Pre-primary/ Primary	65 (18.3)
Secondary	222 (62.4)
Certificate/ Diploma/ Degree/ Post-grad	69 (19.4)
Main source of income	
Wage work	182 (51.9)
Casual work	37 (10.5)
Spouse/partner/family	22 (6.3)
Small business owner	71 (20.2)
Other/ Student/ Nothing	39 (11.1)
Relationship Characteristics	
Relationship status	
Married	38 (10.7)
Cohabiting, not married	124 (34.8)
In relationship, not cohabiting	117 (32.9)
No partner	76 (21.4)
Know HIV status of partner	
Yes	252 (90.0)
No	28 (10.0)
HIV-status of partner	
HIV-positive	132 (52.4)
HIV-negative/unknown	120 (47.6)
Have children with current partner	132/279 (47.3)
Reproductive health and HIV care history	
Total number of pregnancies	2.43 (1.4)
Number of years since HIV diagnosis	8.54 (5.8)
Currently taking ART	351 (98.6)
Told you are currently virally suppressed	185 (53.2)
Pregnancy since being diagnosed with HIV	169 (47.5)
Ever enrolled in PMTCT	178 (57.4)
Fertility intentions	
Desire for children/ more children in future	
Yes	243 (68.3)
No	113 (31.7)
SC information, motivation, behavioral skills	
SC knowledge (mean (SD); scale range)	11.21 (2.7) [1-17]
SC Motivation (mean (SD); scale range)	11.17 (1.6) [3-12]
SC Behavioral skills (mean (SD); range)	3.00 (1.7) [0-6]
Self-efficacy for skills (mean (SD); range)	21.79 (2.9) [6-24]

Table 4-2: Percentage of participants correctly answering each item of the safer conception method awareness scale (correct responses in bold)

Questions about SC in general and specific SC methods	True	False	Don't know
1. It is possible for an HIV-positive woman to have an HIV-negative baby.	93.5%	2.5%	3.9%
2. HIV antiretroviral medications can reduce the risk of passing HIV to a baby.	89.0%	3.9%	7.0%
3. There are ways to make conception with an HIV-positive partner safer.	85.4%	2.8%	11.8%
4. There are ways to make conception with an HIV-negative partner safer.	85.7%	4.5%	9.8%
5. All options to make conception safer are very expensive.	10.4%	75.0%	14.6%
6. Waiting until one's CD4 count is higher will reduce the risk of health complications to the mother during pregnancy.	77.3%	12.1%	10.7%
7. Having a sexually transmitted infection will increase the risk of passing HIV to an uninfected partner during unprotected sex.	87.9%	5.1%	7.0%
8. There are times during a woman's cycle when she is most fertile (likely to become pregnant).	73.9%	5.1%	21.1%
9. Healthcare providers can offer advice to help make childbearing safer for women, their partners, and their children.	90.7%	4.2%	5.1%
10. If an HIV-positive person has an undetectable amount of HIV virus, it means that person is no longer able to infect someone else.	30.6%	51.7%	17.7%
11. Having the man ejaculate into condom/ container and manually inject semen into woman's vagina is a way to reduce risk of HIV transmission if man is HIV-negative.	40.2%	16.9%	43.0%
12. Only having unprotected sex during the few days each month when the woman is most fertile will help to reduce the risk of HIV transmission to an uninfected partner.	18.0%	53.7%	28.4%
13. There is technology available that can cleanse a man's sperm or semen of the HIV virus.	10.7%	32.6%	56.7%
14. Starting to take HIV medications early (as soon as diagnosed) helps reduce the risk of transmitting HIV to a sexual partner.	61.5%	25.8%	12.6%
15. HIV medications can be taken by an HIV-positive partner who wants to conceive with an HIV-negative partner in order to reduce the chance of transmitting HIV to the negative partner.	64.3%	18.5%	17.1%
16. HIV medications can be taken by an HIV-negative (or unknown status) partner that will reduce their risk of getting infected by their HIV-positive partner.	34.3%	46.6%	19.1%
17. An HIV-negative man can be circumcised as a way to reduce the chance of the man getting HIV during unprotected sex when a couple is trying to get pregnant.	82.6%	9.0%	8.4%
Mean score (SD) for awareness of SC methods (scale range 0-17)	11.0 (2.8)		
Median score for awareness of SC methods	11		

Table 4-3: Bivariate correlation coefficients between information, motivation, behavioral skills, and self-efficacy towards safer conception

Variable	Information		Motivation		Behavioral skills		Self-Efficacy	
	Value	p-value	Value	p-value	Value	p-value	Value	p-value
Demographics								
Age	0.09	0.1002	0.07	0.1609	0.11	0.0385	0.04	0.4951
Level of education	0.94	0.3902	3.83	0.0226	0.25	0.7774	1.05	0.3519
Source of income	0.76	0.5513	3.07	0.0165	0.53	0.7139	0.30	0.8750
Clinic recruitment site	0.52	0.5961	2.22	0.1100	8.01	0.0004	4.22	0.0154
Relationship/ Partner								
Relationship status	0.19	0.9015	0.82	0.4826	4.53	0.0039	3.90	0.0092
Know partner status	2.74	0.0659	4.23	0.0153	8.05	0.0004	7.10	0.0010
HIV status of partner	1.90	0.1510	3.20	0.0418	8.35	0.0003	6.81	0.0013
HIV status disclosure	4.10	0.0174	2.36	0.0959	5.80	0.0033	5.83	0.0032
Importance of children to partner	3.59	0.0285	2.96	0.0530	21.39	<0.001	8.37	0.0003
Perceived partner willingness to use SC	0.16	0.0037	0.19	0.0003	0.24	<0.001	0.53	<0.001
Talked to partner about pregnancy desire before pregnancy	0.13	0.8785	0.50	0.6082	24.68	<0.001	1.05	0.3519
Talked to partner about SC before pregnancy	0.53	0.5862	3.59	0.0287	30.22	<0.001	3.35	0.0362
Reproductive history								
Total pregnancies	0.03	0.5569	-0.14	0.0093	0.06	0.2590	-0.06	0.2683
Pregnancy since HIV diagnosis	0.15	0.8589	0.34	0.7139	11.64	<0.001	1.43	0.2414
Used PMTCT	0.44	0.6474	0.42	0.6576	8.90	0.0002	2.07	0.1282
Current use of family planning method	-1.98	0.0489	0.20	0.8450	-2.80	0.0055	-3.77	0.0002
HIV history								
Years with HIV	0.02	0.7319	0.02	0.7600	0.06	0.2726	0.003	0.9449
Virally suppressed	0.27	0.7640	2.34	0.0977	5.77	0.0034	6.86	0.0012
Fertility intentions								
Desire more kids any time in future	2.35	0.0718	5.54	0.0010	2.49	0.0602	7.19	0.0001
When want next child	1.71	0.1650	3.03	0.0295	2.20	0.0882	7.44	0.0001
Partner wants pregnancy within next year	0.81	0.4874	1.32	0.2691	4.77	0.0028	2.12	0.0972
Reproductive autonomy								
Decision-making	-0.01	0.8141	-0.18	0.0010	-0.15	0.0044	-0.08	0.1240
Freedom from coercion	0.11	0.0344	0.17	0.0014	0.11	0.0453	0.35	<0.001
Communication	0.15	0.0043	0.21	0.0001	0.30	<0.001	0.46	<0.001
Interactions with HCWs								
Talked to HCW about pregnancy desire before	0.09	0.9141	1.27	0.2832	32.21	<0.001	2.16	0.1171

pregnancy								
Talked to HCW about SC before pregnancy	0.12	0.8832	2.01	0.1353	32.45	<0.001	2.85	0.0594
Desire discussions with HCW about SC	-3.54	0.0005	-6.51	<0.001	-4.55	<0.001	-9.41	<0.001
Who should start SC discussions	5.39	0.0012	10.60	<0.001	4.23	0.0059	20.93	<0.001
Stigma								
Anticipated stigma	-0.14	0.0070	-0.19	0.0003	-0.07	0.1936	-0.29	<0.001
Internalized stigma towards childbearing	-0.25	<0.001	-0.29	<0.001	-0.23	<0.001	-0.43	<0.001
Community stigma towards childbearing	-0.11	0.0393	0.18	0.0006	0.01	0.8528	0.13	0.0123
Perceived provider stigma of childbearing	1.03	0.3047	0.40	0.6903	0.97	0.3331	2.19	0.0291
Safer conception IMB								
SC information	-----	-----	0.16	0.0023	0.24	<0.001	0.32	<0.001
SC motivation	0.16	0.0023	-----	-----	0.13	0.0132	0.39	<0.001
SC behavioral skills	0.24	<0.001	0.13	0.0132	-----	-----	0.47	<0.001
Self-efficacy for BS	0.32	<0.001	0.39	<0.001	0.47	<0.001	-----	-----
Intentions and Use of SC								
Intention to use SC	-4.06	0.0001	-4.65	<0.001	-4.95	<0.001	-8.39	<0.001
Use of any SC at last pregnancy	0.24	0.7859	1.00	0.3673	21.13	<0.001	0.71	0.4914

Table 4-4: Multiple linear regression analysis of correlates of information, motivation, behavioral skills, and self-efficacy regarding safer conception

VARIABLES	Information		Motivation		Behavioral skills		Self-Efficacy	
	Beta	SE	Beta	SE	Beta	SE	Beta	SE
Demographics								
Clinic recruitment site								
Hospital-based clinic	---		---		---		---	
Peri-urban clinics	-0.81	(0.55)	-0.02	(0.29)	-0.28	(0.27)	0.75**	(0.38)
Urban clinics	-0.20	(0.39)	-0.04	(0.21)	-0.23	(0.20)	0.30	(0.27)
Age	0.02	(0.03)	0.03	(0.02)	0.01	(0.02)	-0.02	(0.02)
Level of education								
No formal education/ Pre-primary/Primary	---		---		---		---	
Secondary	0.50	(0.45)	-0.50**	(0.24)	-0.03	(0.23)	-0.33	(0.31)
Certificate	1.23**	(0.57)	-0.14	(0.30)	0.03	(0.29)	-0.17	(0.40)
Source of income								
Wage work	---		---		---		---	
Casual work	0.30	(0.52)	0.01	(0.27)	0.01	(0.26)	-0.33	(0.36)
Spouse/ pa	0.41	(0.65)	-1.06***	(0.34)	-0.16	(0.33)	-0.11	(0.45)
Small business	0.21	(0.40)	-0.21	(0.21)	0.15	(0.20)	-0.49*	(0.28)
Other	-0.30	(0.53)	0.14	(0.28)	0.06	(0.27)	-0.39	(0.37)
Relationship/ Partner								
Relationship status								
No partner	---		---		---		---	
Married	-0.49	(0.72)	-0.69*	(0.38)	-0.47	(0.36)	0.15	(0.50)
Cohabiting	-0.10	(0.59)	-0.30	(0.31)	-0.55*	(0.29)	-0.19	(0.41)
In relationship, not cohabiting	0.05	(0.56)	-0.33	(0.29)	-0.77***	(0.28)	0.09	(0.39)
Importance of children to partner								
Not important	---		---		---		---	
Important	0.35	(0.46)	-0.11	(0.24)	0.76***	(0.23)	-0.78**	(0.32)
Perceived partner willingness to use SC	-0.04	(0.06)	-0.02	(0.03)	0.04	(0.03)	0.19***	(0.04)
Reproductive/ HIV history								
Total pregnancies	0.21	(0.14)	-0.14*	(0.07)	-0.05	(0.07)	0.13	(0.10)
Family planning method use								
No current use	---		---		---		---	
Current use	-0.35	(0.82)	-0.14	(0.43)	0.24	(0.41)	1.39**	(0.57)
Viral suppression								
Not suppressed	---		---		---		---	
Suppressed	-0.24	(0.32)	0.04	(0.17)	0.21	(0.16)	0.22	(0.22)
Not using ART	-0.84	(1.42)	0.33	(0.75)	-0.11	(0.71)	0.46	(0.99)
Reproductive autonomy								

Decision-making	0.12	(0.13)	-0.26***	(0.06)	-0.09	(0.06)	0.06	(0.09)
Freedom from coercion	-0.01	(0.06)	0.02	(0.03)	-0.03	(0.03)	0.09**	(0.04)
Communication	0.00	(0.07)	-0.01	(0.03)	0.03	(0.03)	0.08*	(0.05)
Fertility and SC Intentions								
Desire for children in future								
No	---		---		---		---	
Yes	0.11	(0.40)	-0.02	(0.21)	0.38*	(0.20)	-0.01	(0.28)
Intention to use SC in future								
Not likely	---		---		---		---	
Likely	0.69	(0.66)	0.47	(0.35)	0.18	(0.33)	1.34***	(0.46)
Prior use of SC								
No	---		---		---		---	
Yes	-0.21	(0.52)	0.72***	(0.27)	1.09***	(0.25)	-0.53	(0.36)
No pregnancy since HIV diagnosis	0.19	(0.40)	0.26	(0.21)	-0.38*	(0.20)	-0.09	(0.28)
Interactions with HCWs								
Desire for SC discussions with providers								
No/ Don't know	---		---		---		---	
Yes	-0.06	(0.52)	0.75***	(0.27)	0.27	(0.26)	1.07***	(0.35)
Who should start SC discussions								
Don't know/ Neither	---		---		---		---	
Women living with HIV	-0.43	(0.67)	0.87**	(0.35)	-0.63*	(0.33)	0.96**	(0.46)
Healthcare providers	-0.27	(0.66)	1.21***	(0.34)	-0.26	(0.33)	0.26	(0.46)
Both	0.34	(0.64)	0.77**	(0.34)	-0.39	(0.32)	0.87*	(0.44)
Stigma								
Anticipated stigma	-0.02	(0.06)	-0.01	(0.03)	0.07**	(0.03)	-0.07*	(0.04)
Internalized stigma towards childbearing	-0.26	(0.18)	-0.10	(0.09)	-0.02	(0.09)	-	(0.12)
Community childbearing stigma	-0.08*	(0.04)	0.05**	(0.02)	-0.02	(0.02)	0.03	(0.03)
Safer conception IMB/SE								
SC information	.	(.)	0.03	(0.03)	0.04	(0.03)	0.09**	(0.04)
SC motivation	0.09	(0.11)	.	(.)	-0.08	(0.06)	0.23***	(0.08)
SC behavioral skills	0.15	(0.12)	-0.09	(0.06)	.	(.)	0.43***	(0.08)
SC Self-efficacy	0.19**	(0.08)	0.13***	(0.04)	0.22***	(0.04)	.	(.)

Standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

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CHAPTER 5

Conclusion

Childbearing is a human right and central to the construction of female gender identity for many cultures, regardless of HIV status. Research has shown that women living with HIV will continue to have children despite advice from providers to stop childbearing and regardless of the HIV transmission risks involved (Goggin et al., 2015; West et al., 2016). In sub-Saharan Africa, 20 to 59% of people living with HIV are in their reproductive years, desire children, and sero-discordance rates are reported to be close to 50% (Beyeza-Kashesya et al., 2010; Eyawo et al., 2010; Gutin et al., 2014; Kawale et al., 2015; Ngure et al., 2014; Tesfaye et al., 2012). Given this, it seems plausible that some portion of new HIV transmissions are due to attempts to become pregnant. However, various low-cost SC methods that effectively reduce the risk of HIV transmission can be made available in resource-constrained settings in order to achieve pregnancy safely (Gray et al., 2007; Mmeje et al., 2012, 2015; Rodger et al., 2016; Schwartz et al., 2017; Vernazza et al., 2011; Wagner et al., 2017). Despite these various options, these techniques are not currently being offered as the standard of care in Botswana and similar contexts. The lack of SC counseling and services is a significant gap in the current system of care for women living with HIV across much of sub-Saharan Africa and SC services are urgently needed by those who wish to have children (Goggin et al., 2014).

As Botswana continues to implement a test and treat approach, greater numbers of people living with HIV who have childbearing desires will enter care. While Botswana has exhibited strong political support to treat HIV and is already on track to reach UNAIDS 90-90-90 targets

by 2020, the country has struggled to control new HIV infections (Gaolathe et al., 2017). In this research, almost 50% of women living with HIV were in sero-discordant or unknown status relationships and desired more children in the future. SC is especially relevant for these couples since they must address concerns about both horizontal and vertical transmission when trying to have children (Saleem et al., 2017).

While research has shown that viral suppression should address concerns about HIV transmission and led leading scientific and medical organizations to launch the Undetectable = Untransmittable (U = U) campaign, SC continues to be an important intervention because routine viral load testing is absent in many sub-Saharan contexts and adherence is not always adequate to achieve suppression (M. S. Cohen et al., 2011; Keiser et al., 2011; Mills, Nachega, Bangsberg, et al., 2006; Rodger et al., 2016; UNAIDS, 2017). Our research further supports this since only 53% of women living with HIV reported that they had been told they were currently virally suppressed. This highlights the need to promote SC approaches among HIV-affected couples who would like to become pregnant. In addition, data from Botswana has suggested an elevated risk of fetal neural tube defects in women with preconception exposure to the antiretroviral drug Dolutegravir (Zash, Jacobson, et al., 2018; Zash, Makhema, et al., 2018). This focuses attention on the need for pre-conception counseling and pregnancy planning in order to protect the developing fetus from possibly teratogenic regimens. Therefore, along with ART, a range of SC techniques should be offered to HIV affected couples who desire childbearing as part of a comprehensive continuum of care. Alternatively, women who do not desire childbearing should be offered a range of effective contraceptive methods. The results of the ECHO trial have recently shown that there are no substantial differences in the risk of HIV acquisition from both hormonal (depot medroxyprogesterone acetate (DMPA-IM) and levonorgestrel implants) and

non-hormonal (copper intrauterine device (IUD)) contraceptive methods, have reaffirmed the safety and effectiveness these methods, and underscore the importance of increased access to contraceptives (Evidence for Contraceptive Options and HIV Outcomes (ECHO) Trial Consortium, 2019; Noguchi & Simelela, 2019). Integrating HIV prevention, contraceptive services, and SC counseling and techniques would allow couples to choose the methods they prefer and that are acceptable within their relationships while also supporting reproductive choice.

Taken together, this research highlights the factors at multiple levels that need to be addressed in order to successfully offer SC in Botswana and similar contexts. This research has helped to fill a gap in the literature, answered many questions, and pointed to areas that need special attention as no previous studies in Botswana had qualitatively or quantitatively examined issues related to SC. Across these studies, it became clear that in order to develop interventions and service delivery models that are responsive to the needs of women living with HIV, it would be necessary to address issues that occur at multiple, inter-related levels, and that approaches aimed at only one level would be ineffective. Based on the findings, we propose a multi-pronged approach that addresses issues at the individual, interpersonal (couple and provider level), structural, and policy level and that should aid in SC implementation and uptake.

Key themes

Individuals. Across the three studies, women living with HIV showed that although they generally lack knowledge about a range of SC methods, interest and motivation to use these strategies appears to be high. Specifically, these studies showed low information about PrEP and vaginal insemination for SC. Research from South Africa has similarly noted low knowledge

about PrEP and self insemination techniques (Matthews et al., 2015; Schwartz et al., 2014). An intervention aimed at improving SC uptake would need to educate women living with HIV about a range of SC techniques.

Another key finding was with regards to pregnancy planning. It appears that women living with HIV and providers conceptualize pregnancy planning differently. While providers saw the clinical pre-conception advice they could offer women living with HIV as key, women were not arriving for these services. While some research has found that concerted pregnancy planning is rare or may not be relevant in sub-Saharan African contexts, our findings suggest that some women living with HIV are discussing pregnancy desires with their male partners (Evens et al., 2015; Schaan et al., 2016). Such planning is especially relevant for sero-discordant couples. The findings highlight that SC services are needed, as couples do discuss ways to achieve pregnancy safely. However, it is necessary to be proactive and routinely assess fertility desires, as few women living with HIV and their sero-discordant partners will specifically come seeking these services.

Partners/ Couples. Across the three studies, relationship and partner characteristics emerged as especially important and highlight the importance of male partners in reproductive decision-making. Data from various sub-Saharan African countries has shown the important influence of partners on fertility desires and on SC method uptake with male partners acting as both a facilitator and barrier to greater uptake (Bekker et al., 2011; Beyeza-Kashesya et al., 2010; Gutin et al., 2014; Matthews et al., 2013; Ngure et al., 2014; Schwartz et al., 2017; Wagner et al., 2016). Our findings show that partners are involved in pregnancy planning, play an important role in SC method decision-making and use, and have an impact on SC behavioral skills and

self-efficacy. Therefore, fully involving male partners who are not living with HIV in couples-based SC counseling and decision-making is imperative for the success of any SC program. Leveraging existing services that target couples, such as integrating SC counseling and services within couples' voluntary HIV counseling and testing, partner disclosure programs, or STI treatment services, may help to reach more couples with SC counseling and methods. In particular, couples' voluntary HIV counseling and testing may be a useful place for SC services as couples testing has been associated with reductions in HIV incidence, STIs, and unplanned pregnancies among sero-discordant couples (Allen et al., 2003; Wall et al., 2017). Existing couples-based interventions that provide the opportunity to gain information, behavioral skills, and discuss issues that require agreement among partners may be the ideal place to discuss SC. In addition, offering SC counseling in community-level or non-clinic spaces that are not seen as woman-dominated spheres may increase male engagement and help draw discordant couples who desire these services.

Providers. As has been noted elsewhere in the literature, the findings in this dissertation have established that interactions with healthcare providers are critical to SC uptake (Goggin et al., 2015, 2014; Kawale et al., 2015; Matthews et al., 2014, 2015; West et al., 2016). Providers in Botswana are at a turning point as it relates to supporting childbearing for people living with HIV and it appears they are having trouble translating rights-based rhetoric into practice. While providers in the first study did not express overtly stigmatizing views towards childbearing amongst people living with HIV, their statements suggest hesitancy about women living with HIV having repeat pregnancies or children within discordant relationships. Women living with HIV anticipate stigma because of their reproductive desires and as a result, they often do not start

SC discussions or come to seek SC services. Therefore, women living with HIV may be more comfortable if SC discussions were provider-initiated. Normalizing discussions about pregnancy desires and SC and routinely assessing these needs at reproductive health visits regardless of HIV status may help address concerns about stigma and signal to people living with HIV that childbearing is a normal part of life that can be discussed within clinical care settings.

These studies and other research suggest that providers will need and are receptive to receiving training on SC because they would like to know how to better support HIV-affected couples who want children (Crankshaw et al., 2014; Goggin et al., 2015; Matthews et al., 2016; Patwa et al., 2019). In many ways, the interactions that women living with HIV have with healthcare providers will affect the care they seek in the future. Therefore, an important early step in building SC services will be developing interventions to train providers on SC strategies as they are in need of accurate SC information. Specifically, in the context of U=U, it will be imperative to educate providers that people living with HIV with an undetectable viral load cannot transmit HIV (Rodger et al., 2016). Also, while providers in Botswana recognize that women living with HIV are going to have children and that this is their reproductive and human right, many still need help to appropriately convey risk and need to be more careful about the language they use when counseling clients. Training interventions for providers should focus on how to routinely assess childbearing desires, values clarification, examining biases, reducing the use of stigmatizing language, and best practices for counseling HIV sero-discordant couples about a range of SC techniques in a supportive environment.

Structural. SC interventions are unlikely to be successful if women do not feel comfortable discussing childbearing with providers and at the root of this issue is stigma. While

few women in these studies had experienced enacted stigma, internalized stigma towards childbearing, anticipated stigma from providers and family members regarding childbearing, and perceived community stigma around childbearing were evident. Although the first cases of HIV were reported in Botswana in 1985 and the government has offered treatment for over 15 years, various forms of stigma are still prevalent and would hinder SC uptake (National Council on Population and Development et al., 2010; Wolfe et al., 2006). As noted above, it is necessary to destigmatize childbearing for sero-discordant couples and try to address stigma at multiple levels. Routine, provider-initiated fertility desire discussions at reproductive health visits with all people of reproductive age, regardless of HIV status, may signal that childbearing is a topic that is not off limits and be one way to address anticipated stigma at the structural level. Additionally, it may be possible to see improvements in SC information, motivation, and self-efficacy if interventions for women living with HIV address internalized childbearing stigma and perceived community stigma around childbearing.

Policy. Current Botswana HIV clinical care guidelines mention various SC approaches but provide little guidance on the package of services to offer women living with HIV who want to become pregnant (Botswana MOH & Masa, 2016). This research suggests that before attempting to offer SC services, Ministry of Health documents will need to be updated to provide more detailed SC counseling guidelines about a range of possible SC approaches. This would aid providers in delivering this service to HIV-affected couples. In addition, although the most recent Botswana HIV clinical care guidelines suggest that PrEP could be appropriate for discordant couples attempting to conceive, PrEP is not yet widely available in the public sector and little guidance has been offered on counseling couples on this strategy (Botswana MOH &

Masa, 2016). Although PrEP can be accessed in the private sector, the associated cost is prohibitive for many. In order to make PrEP a viable SC option in Botswana and expand access beyond the private sector, we recommend that the Ministry of Health make PrEP available free of charge in the public sector for sero-discordant partners.

Future research and interventions. Despite the wealth of information gained from this enquiry, there are still unanswered questions and new areas that need to be examined in greater depth. While we recommend that interventions for sero-discordant couples will be especially important and that placing SC counseling within existing couples-based services will help reach couples, future research will need to focus on effective SC counseling strategies for engaging couples where the woman is living with HIV and her male partner is not living with HIV. Studies focused on men living with HIV and men not living with HIV in discordant relationships could assess their interest in specific SC methods, examine the cultural acceptability of methods, and the feasibility of use. Such studies should be conducted in both urban and rural contexts as the current studies were all conducted among urban samples and rural couples may have different needs. Couples-based in-depth interviews might be another way to examine SC concerns, how couples discuss SC, and the best location for SC services. Some SC services in other sub-Saharan African countries have been offered as stand-alone services (Schwartz et al., 2017). We assume that such an approach is less sustainable in the long term but that may not be true. Studies to assess how and where couples wish to receive SC services so that they are accessible will be important. A couples-based SC intervention for women living with HIV and their sero-negative male partners that provides information about various SC methods, works on building

specific behavioral skills to use SC methods, and tries to address internalized childbearing stigma and perceived community stigma by educating about reproductive rights should be developed.

But when is the ideal time to offer these interventions? In their in-depth interviews, women living with HIV discussed motherhood as a central aspect of being a woman in Botswana. While some mentioned that achieving pregnancy safely was discussed briefly when they initiated ART, it was rarely discussed again, and this information mostly focused on reducing transmission to babies. Upon learning about their HIV status, providers reported that women often wanted to know whether they would still be able to have children. Therefore, we propose that an intervention aimed at newly diagnosed women living with HIV should be developed and could be offered prior to, or as part of, ART initiation. Such an intervention could focus on women's reproductive rights, the ability to have safe pregnancies, seeking clinical support, pre-conception wellness, optimizing treatment adherence, SC strategies, and the need for safe and effective family planning methods if pregnancy is not desired. We hypothesize that such an intervention might also help address internalized childbearing stigma and anticipated stigma.

The need to address various forms of HIV stigma is a clear imperative of this research. Women who took part in focus group discussions were all members of HIV support groups. During focus group discussions, many women discussed how the support they received from these groups was critical to accepting their HIV status and living positively. Therefore, a stigma reduction intervention that links newly diagnosed women living with HIV with support groups may help reduce stigma, in particular internalized and perceived community stigma around childbearing. A more focused stigma reduction intervention for providers is also needed. Women living with HIV anticipate and perceive stigma from healthcare providers. As noted above, an

intervention that addresses provider bias, focuses on values clarification around childbearing for people living with HIV, and builds skills for counseling about pregnancy and childbearing in a non-stigmatizing way is warranted.

While we advocate that a range of SC methods should be made available, women in the second study were particularly interested in PrEP and vaginal insemination approaches. Demonstration projects are necessary to take this work to the next level and could look at uptake and outcomes for these and other SC methods. Also, while PrEP use by discordant couples is a promising strategy to pursue in Botswana, the Ministry of Health is likely to desire further research about this method before making it more widely available. A qualitative inquiry among sero-discordant couples (woman is living with HIV and sero-negative male partner) could examine the acceptability of PrEP use for SC and the feasibility of accessing such services through public sector clinics. A longitudinal study that examines PrEP use by discordant couples and pregnancy outcomes is warranted. In addition, vaginal insemination approaches and interventions have been examined in Kenya (Mmeje et al., 2012, 2015) and could be tested in Botswana as well.

Using SC methods however assumes a certain amount of pregnancy planning. While elements of pregnancy planning did seem to be salient for women living with HIV in the first study, women highlighted that pregnancy planning was most relevant for sero-discordant couples because of their concerns about HIV transmission to partners. Pregnancy planning in discordant partnerships (where either the man or woman is the person living with HIV) deserves to be examined in greater depth in future research. Better understanding how sero-discordant couples do, or do not, plan for pregnancy can help with the development of SC services that better meet their needs.

Finally, during focus group discussions, women discussed the importance of motherhood in Botswana and how having children gives a woman dignity. Other research has established the importance of parenthood for both men and women in Botswana (Schaan et al., 2016; Upton & Dolan, 2011) but has not examined if or how HIV modifies these cultural expectations, and the effect that this has on women living with HIV. A more in-depth exploration of this issue would help to further frame SC within Botswana and provide a useful grounding for developing stigma reduction interventions for women living with HIV.

We believe that in order to implement SC programs that will succeed, it is necessary to address barriers with a multi-pronged, multi-level approach that takes place within a supportive policy environment. Interventions that focus at only one level, without acknowledging or addressing these inter-related factors, will have only limited success. SC methods are an important HIV prevention strategy that can help sero-discordant couples to reduce incident HIV cases when trying to achieve pregnancy. We should strive to normalize childbearing for people living with HIV and offer a range of SC methods as part of a larger continuum of care services that includes an assessment of fertility desires, contraceptive services, SC options, and PMTCT. Offering these services will not only support HIV-affected couples to achieve their desired family size but will also protect and affirm their reproductive rights.

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APPENDICES

Appendix 1: In-depth Interview Guides

In-depth interview guide for policy stakeholders

Thank you for agreeing to speak with me today.

My name is.... [INTRODUCE SELF AND ROLE]. The goal of this interview is to gain a deeper understanding of reproductive, fertility, and pre-conception counseling services for people living with HIV in Botswana.

I really appreciate your help. I would like you to talk with me as honestly as possible because your honest views are important to me. There are no right or wrong answers and all comments – positive and negative – are welcome. I hope that you will feel comfortable sharing your thoughts. Please remember that I am here today to hear from you, to ask you questions and to listen to what you have to say because your thoughts and experiences will help me better understand this topic.

Anything that you say to me will be kept confidential. What we discuss is recorded and then written out into words on paper. When it is written out, all information that could identify you to someone reading the words (anything said with names or locations or that kind of thing) are completely removed. The material from our interview is saved with your participant number but not your name. The text from this interview will be reviewed along with text from other interviews, so main topics people talked about can be identified. Even though what you say will not be shared to anyone as something you specifically said, we do plan to present sentences from different people's interviews if they provide a really good example of a main topic. You might recognize it as something you said, but others won't be able to know that. No names are ever used when presenting this information.

You have consented to record this discussion. I may also be taking notes on the things you are saying to help me follow the discussion.

I would like to start recording. Before we do this, do you have any questions? Are you ready to begin?

INTERVIEWER TURNS ON THE TAPE RECORDER TO START THE DISCUSSION

<u>Current Practice</u>

In your opinion, what does it mean to provide sexual and reproductive health

services to people living with HIV?

- From your perspective, what is included in SRH services?
- Can you please tell me about the reproductive health services that are available to HIV-positive women and men in Botswana?
- What do you feel Botswana has done particularly well in terms of offering reproductive health services for people living with HIV?

I know that Botswana has started to prioritize integration of HIV with other services. What does integration mean in terms of sexual and reproductive health and HIV?

- How is that actually operationalized? Examples?
- What is working well? Not working?
- What is good/bad about this approach?

Can you tell me, is there a policy in place in Botswana or are there clinical guidelines about safer pregnancy or pregnancy planning among HIV-positive /discordant couples? Please tell me more about that.

- Policy/guidelines about HIV discordant couples and safer pregnancy?
- Who developed these guidelines?
- Are these guidelines and policies being implemented?
- Do you think that training takes place around these guidelines/policies? Who receives this training? Who conducts the training?

As far as I know, Botswana has recently shifted to the Option B+ strategy whereby pregnant women with HIV are initiated on ART immediately and encouraged to stay on for life. **What do you think about this policy shift?**

- What do you see as the benefits or drawbacks of this policy?
- One of the areas we are exploring is pre-conception counseling and safer pregnancy for people living with HIV. Are there any links between Option B+ and safer pregnancy?

How do people in Botswana feel about people with HIV who want to have children?

- How do you think HIV-positive couples who want pregnancies are treated? [Probe- in clinic by HCWs, in community].
- Should people living with HIV be supported to have children?

Botswana has done well with ART rollout. How has this changed the way people living with HIV think about having children?

- How has this changed the way people in Botswana think about people living with HIV having children? [Probe- in clinic, in community]

Knowledge of Safer conception

There have been moves in some countries to provide safer conception services to people living with HIV. From where you sit, what does that mean to you?

- Are there any safer conception services or pre-conception counseling services

available to people living with HIV in Botswana that you know of?

- Are there any guidelines/policies?
- How is this being operationalized / implemented?
- Do you know of any safer conception /safer pregnancy approaches that are being used elsewhere? [Timed intercourse around ovulation, ARVs, sperm washing]

ART adherence has proven very effective in clinical trials in reducing the risk of transmitting HIV to heterosexual partners.

- To what extent do you think healthcare workers in Botswana are aware of that information?
- To what extent do you think that people living with HIV are aware of the importance of adherence to ART in terms of reducing transmission risks?
- To the best of your knowledge, are couples told about the effectiveness of ART treatment for preventing the spread of HIV to infants and partners?
- To what extent do you think the general public knows about this?
- Some people are concerned that letting people know about this leads to more risk behavior. What do you think?

Have you ever heard of pre-exposure prophylaxis for the prevention of HIV (otherwise known as PrEP)?

- **If no**, read the following description: Pre-exposure prophylaxis, or PrEP, is a way for people who do not have HIV but who are at substantial risk of getting it to prevent HIV infection by taking a pill every day. The pill contains two medicines that are used in combination with other medicines to treat HIV. When someone is exposed to HIV, these medicines can work to keep the virus from establishing a permanent infection.
- **If yes** – Do you think there is discussion happening in Botswana about the use of PrEP to prevent the spread of HIV to partners?
- What are your thoughts about PrEP - could it be appropriate for use in Botswana?
- Do you think PrEP could be used in the context of safer conception for HIV-positive partners?
- Do you think people living with HIV would be interested in this?

Where would women/couples in Botswana get information about the importance of adherence or PrEP?

- Where could they have these conversations?
- Where might this fit in? At the policy level? Guidelines? In terms of provider provision?
- Some have suggested – what do you think about that?

Recommendations

What do you think are the main challenges/barriers to offering safer pregnancy or preconception planning services for people living with HIV in Botswana?

- At policy level? At provider level?
- What more could be done in this area to improve access to services?

- Why has/hasn't that happened?
- Reasons for why?
- What are the limitations in the system that prevent these things from happening?

Thank you. That concludes the interview but I wanted to ask you if there is anything we have not discussed about reproductive health and planning among people living with HIV that you think is important.

In-depth interview guide for HIV and SRH care providers

Thank you for agreeing to speak with me today.

My name is.... [INTRODUCE SELF AND ROLE]. The goal of this interview is to gain a deeper understanding of reproductive, fertility, and pre-conception counseling services for people living with HIV in Botswana.

I really appreciate your help. I would like you to talk with me as honestly as possible because your honest views are important to me. There are no right or wrong answers and all comments – positive and negative – are welcome. I hope that you will feel comfortable sharing your thoughts. Please remember that I am here today to hear from you, to ask you questions and to listen to what you have to say because your thoughts and experiences will help me better understand this topic.

Anything that you say to me will be kept confidential. What we discuss is recorded and then written out into words on paper. When it is written out, all information that could identify you to someone reading the words (anything said with names or locations or that kind of thing) are completely removed. The material from our interview is saved with your participant number but not your name. The text from this interview will be reviewed along with text from other interviews, so main topics people talked about can be identified. Even though what you say will not be shared to anyone as something you specifically said, we do plan to present sentences from different people's interviews if they provide a really good example of a main topic. You might recognize it as something you said, but others won't be able to know that. No names are ever used when presenting this information.

You have consented to record this discussion. I may also be taking notes on the things you are saying to help me follow the discussion.

I would like to start recording. Before we do this, do you have any questions? Are you ready to begin?

INTERVIEWER TURNS ON THE TAPE RECORDER TO START THE DISCUSSION

Demographics

How old are you?

What is the position that you hold at this clinic / your clinical category? What is your role?

How long have you been working at this clinic? How long have you been working as a (nurse, doctor, counselor)?

Have you received any training recently about reproductive health topics such as planning pregnancies? Reproductive health for HIV-positive couples? Can you tell me

about those trainings? When?

How long have you worked with HIV-positive clients?

Attitudes

What are your thoughts and feelings about people living with HIV having children?

- Would you say that is the common perception or do other healthcare providers feel differently in your opinion?

Can you tell me about the kinds of experiences you have had where an HIV-positive patient has fallen pregnant?

- Has an HIV patient ever asked you for help or advice before getting pregnant? Can you tell me about that?

How do people in the community view HIV-positive couples who get pregnant / have children?

- Tell me about the messages HIV-affected couples get in your community about having children?

Based on your experiences, what do you think the main reasons are for wanting children among your HIV-positive patients?

Do you think most pregnancies among HIV-positive patients are planned or unplanned? Why is that?

As a care provider, what is the “perfect” process an HIV-positive patient should follow if they want to have children?

Practices

Can you tell me about any discussions you may have had with your HIV-positive clients about their desire for children? / Do HIV-positive clients ever speak with you about their childbearing desires?

- If no, why do you think they do not discuss this with you?
- If yes, how do you feel about addressing the childbearing desires of your HIV-affected couples?
- How were these conversations for you? Was there anything that made them difficult?
- Who initiated the conversation?
- If the patient initiated, what did they ask?

Do you have a preference on who should start the discussions on having children in an HIV-affected relationship?

- If so, who do you think should bring up this discussion (i.e. the couple or the healthcare provider)?

If an HIV-positive man or women said they wanted to get pregnant in the future, what kind of information or advice would you give them?

If an HIV-positive woman was gone from the clinic for a while and then returned pregnant, what would you say to her? [Probe- reactions, feelings, dominant concerns]

Knowledge

As far as you know, is there a policy in place in Botswana about whether people living with HIV should get pregnant or not? Are there any clinical guidelines?

If an HIV-positive woman wants to get pregnant, can you describe for me some ways that she can try to protect herself, her partner or her infant to reduce the chance of transmitting HIV?

- Probe: for any approach inquire about feasibility and acceptability to women and men

Do you think that PMTCT is effective at preventing HIV transmission to infants?

- To what extent are women adherent to treatment when they are on PMTCT?

Have you ever heard of pre-exposure prophylaxis for the prevention of HIV (otherwise known as PrEP)?

- If yes – continue to next question.
- If no, read the following description: Pre-exposure prophylaxis, or PrEP, is a way for people who do not have HIV but who are at substantial risk of getting it to prevent HIV infection by taking a pill every day. The pill contains two medicines that are used in combination with other medicines to treat HIV. When someone is exposed to HIV, these medicines can work to keep the virus from establishing a permanent infection.

In your opinion, could PrEP be appropriate to use in Botswana?

- Do you think PrEP could be used in the context of safer conception for HIV-positive partners?
- Would people living with HIV be interested in PrEP for the purposes of having a safe pregnancy?

If a woman is adherent to her ARV medications and she is virally suppressed, do you think it is safe for her to have a pregnancy?

- Would she be putting her partner at risk if he were HIV-negative?
- Is adherence to ART effective at reducing the transmission of HIV to partners when trying to get pregnant?

Clinic Services available

What kind of reproductive planning services are offered to HIV-positive men or

women at this clinic?

- Are there any things that facilitate these services being offered?
- What more do you think could be done in order to further improve access to these services?
- In your opinion, are there other reproductive services that people living with HIV at the clinic need?

To what extent are men involved with pregnancy or fertility decisions?

- Do men come to the clinic with fertility concerns? Please explain.

Future needs

How would you feel about having access to information on ways to help you counsel your HIV-affected couples on safe conception and prevention of HIV transmission?

- Can you tell me why this may be important to you?

Can you tell me about what you think your role is as a healthcare provider in providing HIV-affected couples with information on having children while in an HIV-affected relationship?

- Can you tell me how you feel as a healthcare provider helping HIV-affected couples through this process?

Thank you. That concludes the interview but I wanted to ask you if there is anything we have not discussed about reproductive health and planning among people living with HIV that you think is important.

In-depth interview guide for women living with HIV

Thank you for agreeing to speak with me today.

My name is.... [INTRODUCE SELF AND ROLE]. The goal of this interview is to gain a deeper understanding of reproductive, fertility, and pre-conception counseling services for people living with HIV in Botswana.

I really appreciate your help. I would like you to talk with me as honestly as possible because your honest views are important to me. There are no right or wrong answers and all comments – positive and negative – are welcome. I hope that you will feel comfortable sharing your thoughts. Please remember that I am here today to hear from you, to ask you questions and to listen to what you have to say because your thoughts and experiences will help me better understand this topic.

Anything that you say to me will be kept confidential. What we discuss is recorded and then written out into words on paper. When it is written out, all information that could identify you to someone reading the words (anything said with names or locations or that kind of thing) are completely removed. The material from our interview is saved with your participant number but not your name. The text from this interview will be reviewed along with text from other interviews, so main topics people talked about can be identified. Even though what you say will not be shared to anyone as something you specifically said, we do plan to present sentences from different people's interviews if they provide a really good example of a main topic. You might recognize it as something you said, but others won't be able to know that. No names are ever used when presenting this information.

You have consented to record this discussion. I may also be taking notes on the things you are saying to help me follow the discussion.

I would like to start recording. Before we do this, do you have any questions? Are you ready to begin?

Demographics

State: I'd like to start with some questions about you.

Age: _____

Where are you from?

How would you characterize your relationship status?

- Probe: Are you married? Living with someone as married? Single?
- Do you have a regular partner? Someone you have a sexual relationship with?

Do you know your partner's HIV status?

- As far as you know, is he positive or negative?

- When was the last time he checked?

How long have you known that you are HIV-positive?

- When did you find out (for example – was it during a pregnancy)?
- -Are you currently on treatment?

How many times have you been pregnant?

- How many pregnancies have you carried to term?
- How many children do you currently have?
- Number and general ages of boys and girls?

Most recent pregnancy experience

How many pregnancies have you had when you knew you were HIV-positive?

- [If any] Can you share with me what that experience was like for you in terms of support from the clinic or advice you got about the pregnancy, taking care of yourself or the baby?

During this most recent pregnancy, did you seek advice from anyone at the clinic about how to have a safe pregnancy before you got pregnant?

- Why or why not?
- If yes, what did they tell you?

Did any health care workers tell you anything about how to make this pregnancy safer?

- If you received advice, what kind of advice did you get?

When you came to the health center and you were pregnant, can you describe how you were treated by your care providers?

- Probe - Were they supportive of you? Disappointed?
- What kind of things did they say to you?

Past SRH/pregnancy experiences/ communication

When you were last pregnant, how did your healthcare provider react?

- What did they say to you?
- How were you treated?
- Where did you receive care?

How do you think your healthcare provider would react /what would your provider's attitude be if you were to tell them you want to have children/more children?

Has a health care provider ever talked with you about what to do if you want to get pregnant in the future or ways to make a pregnancy safer?

- If yes, what did they tell you?
- How were these conversations for you?
- What would have made those conversations easier?
- Was there anything that made them difficult?
- If they have never had these conversations, why do you think that is?

If you have received information on safer conception/having children in the future from your healthcare provider in the past, what type of information did your provider share with you?

- How were these conversations for you?
- Have they ever mentioned anything to you about the appropriate time for HIV-positive couples to have children?
- Have they mentioned anything about times when you should avoid childbearing? Please explain.
- Have you been satisfied with the information you've received from your healthcare provider on ways for you to safely have children? What have you been most/least satisfied about?

Have you ever tried to start a conversation with a health care provider about how to either have a safe pregnancy or the best way to prevent pregnancy?

- If yes - How did that go? What did you ask? How did the health care worker respond?
- If no – would it be possible for you to start that type of conversation?

Do you think the care providers at this clinic/your clinic are supportive of women living with HIV getting pregnant? Why do you think that?

How do you think people in your community feel about HIV-positive women or couples having children?

- Can you tell me about whether you have had any experiences where someone in the community has said something either positive or negative to you about having children when you are HIV-positive?

How do you feel about communicating your desires for children to others?

- Probe about: healthcare provider, partner, family friends, or children?

Future fertility desires

Do you think that you would like to have more children in the future?

- Why or why not?
- If yes, when?

How would you feel about asking a doctor, nurse or counselor at this clinic about how to get pregnant safely?

- Would you want to discuss how to get pregnant safely with your care provider?

If you got pregnant in the near future, how do you think the care providers at this clinic/ your clinic would react?

Would you like to have advice from your care providers about how to have a safe pregnancy?

- Why? Why Not?

Safer Conception discussions

Tell me about how you view the role of healthcare providers in providing you with information on having children?

How do the conversations about having children when you are HIV-positive usually get started?

- Are conversations initiated by the healthcare provider or by you?
- Do you have any preferences on how these conversations should get started?
- Do you prefer to initiate the conversation about having children or do you think your provider should bring up the question when you start receiving HIV related care and counselling?

How would you feel if your provider incorporated safer conception counselling into your routine check-ups?

- This might mean that a provider would ask whether you were interested in safer conception without you bringing it up, and raise it consistently with other patients. How would this be for you? What do you feel about this?

Knowledge of safe pregnancy options

If an HIV-positive woman wants to get pregnant, do you know of any ways that she can try to protect herself and her partner?

- Please describe the things you have heard of?
- If they name any approaches – is that approach feasible? Is it acceptable to women and men?

Do you think that PMTCT is effective at preventing HIV transmission to infants? - -

- Are women adherent to treatment when they are on PMTCT?

If a woman is taking her ART medications as prescribed every day and she is feeling well, do you think it is safe for her to have a pregnancy or to try and get pregnant?

Is adherence to ART an effective way to reduce the transmission of HIV to partners when trying to get pregnant?

Have you ever heard of something called pre-exposure prophylaxis or PrEP for the prevention of HIV?

- If yes – continue to next question.

- If no, read the following description: Pre-exposure prophylaxis, or PrEP, is a way for people who do not have HIV but who are at substantial risk of getting it to prevent HIV infection by taking a pill every day. The pill contains two medicines that are used in combination with other medicines to treat HIV. When someone is exposed to HIV, these medicines can work to keep the virus from establishing a permanent infection.

If you wanted to get pregnant, and your partner was negative, would you be interested in using PrEP to prevent infection to your partner?

- Do you think it would be possible for you to ask your partner to take PrEP when you are trying to get pregnant?

Role of partners

Has your partner been involved in decisions to have a child?

- If your partner wanted you to get pregnant, how would that affect you?
- Why would you agree to have a child? Why would you refuse?

This will bring our interview to an end. Are there any additional comments or questions that you would like to share?

Appendix 2: Focus Group Discussion Guide

Safer Conception Study: Focus Group Discussion Guide

I. Introduction

Facilitator introduction:

Hello. My name is _____ and my name is _____ and we will be leading our group today. I am a _____ and I work at _____. We would first like to thank you for taking the time to talk with us today. Your thoughts and opinions are very valuable and we appreciate your willingness to help us in our efforts to understand issues around safer conception for people living with HIV in Botswana. Our group will last about 1 hour today.

Reasons for being here:

Thank you very much for agreeing to participate in today's focus group. We are here today to learn more about your thoughts and views about motherhood, pregnancy planning, stigma, and safer conception for people living with HIV in Botswana.

Ground rules: Confidentiality & Respect each other's opinions

Since all of you have different backgrounds and life experiences, you may not all agree with the information and ideas that are presented. This is okay and something that we expect. We do want to make sure that all participants feel safe in today's focus group so we ask that you treat each other with respect and that you do not say anything to another participant that may insult or harm him/her in any way. We also want everyone to feel comfortable expressing their points of view, so we are asking you to not talk about anything that a particular person said in this group to others after the group is over. So basically what is said in the group should stay in the group. This will help to protect everyone's confidentiality and to create a safe and informative group. Do you have any questions before we get started?"

Participant introductions:

We are going to begin today by going around the room and introducing ourselves to each other. In order to do this I would like you to share:

1. Your first name, or some other name that you would like us all to use when talking with you during our session today.
2. Your age
3. How many children you have

Please remember that all participant information will be kept completely confidential. Any names used will be deleted from the transcripts and notes.

II. Importance of pregnancy/ motherhood

Goal: Explore the role of pregnancy/ parenthood in identity formation for people living with HIV in Botswana.

1. In general, how important/not important is parenthood in Botswana?

Probes:

- How does pregnancy/parenthood affect womanhood/manhood or your standing in the community? Can you give me an example of seeing this in your community?
- Do women feel pressure to have children? From whom (individual, partner, family, etc.)?
- How do you/people feel about people who don't have children? Is it looked down upon if women don't have children?
- How important or unimportant is having a child in new intimate relationships? Why?

2. What effect does being a people living with HIV have on the importance of being a parent in Botswana?

Probes:

- How does HIV affect the need/expectation for children? At the personal level? In relationship? Families? Community? Culturally?
- Can you give me an example of messages you have heard in your community/ from healthcare providers about women living with HIV having children?

III. Saliency of pregnancy planning

Goal: Explore the phenomenon of planned pregnancies and what this construct means for people living with HIV in Botswana.

3. I would like to learn more about if women living with HIV/ people living with HIV in Botswana plan for pregnancy. What would it mean for a woman to plan her pregnancy?

Probes:

- Please tell me, if/how do you think most women living with HIV/ people living with HIV in Botswana plan their pregnancy?
- Who plans for pregnancy? (men, women, as an individual, couple)

IV. Information about Safer Conception options/methods and Motivation to use Safer Conception options/methods

Goal: Examine the types of information about SC that people living with HIV need in order to use/ consider using SC. Examine the motivation to use SC (the positive and negative personal, interpersonal, and societal consequences of having children/ using SC).

5. There are various methods/strategies that women living with HIV/couples can use when they want to get pregnant and one or both partners are living with HIV. These strategies, known as safer conception, can help reduce the chance that a sexual partner will become infected with HIV when a couple has unprotected sex while trying to get pregnant.

Activity: Present SC cards with brief description of each approach. Break group up into smaller groups (perhaps 2 people). Pass out a set of cards to everyone.

In your group, please take a look at each of these cards. Each card briefly describes a safer conception method. As you review each card, please think about which methods interest you, which ones you would want more information about, and what additional information people living with HIV would need to be able to use these methods. We invite you to discuss your ideas with your partner. After you have reviewed each method, put the cards in a pile based on which method you would be most willing to use – with the one you like best on the top, and the one you like least on the bottom. If there are any you definitely would not use, put those in a separate pile.

Group leader - When the group comes back together, gather reactions to each SC method.

Now that you have had some time to look at these methods, please tell me, what do you think of these methods?

Information Probes:

- Have you heard of any of these methods?
- Which methods would you want more information about? Why?
- What information would people living with HIV need/want to come for these methods (pregnancy in general? HIV transmission? Specific methods and how they work? The effectiveness of those methods? Their reproductive rights to have children)?

Now let's look at the order you put the cards in.

Motivation Probes:

- You picked X method as your top choice – why? What is good about it? Do others agree/disagree?
- You picked X method as your last choice, why? What is bad about it? What would need to change to make X method your top choice? Do others agree/ disagree?
- Which method do you think your partner would be willing to use? Why?

6. I want to talk about some of the positive and negative things that might happen if you used one of these SC methods. (Pick specific methods to discuss)

Probes:

- What good things might happen as a result of using _____ SC method?
- What bad things might happen as a result of using _____ SC method?

V. Behavioral skills needed to use Safer Conception methods

Goal: Examine the behavioral skills needed to use SC methods.

7. Activity continued: Lets look at the back of the cards. Each method has some skills listed that you might need in order to use that method. I would like to go through each SC method and think about whether you think these are the right skills needed to use that method.

Probes:

- Do you agree with the skills listed?

- What additional skills should be added? Taken away?
- Are the skills that are listed do-able?

VI. Interest in Safer Conception services

Goal: Explore whether there is interest in SC services, preferences for how these services should be offered, and barrier and facilitators to uptake.

8. When some people are considering becoming pregnant, they can go to speak with a healthcare worker and receive something called pre-conception or safer conception counseling. This is where a healthcare worker looks at your health status and discusses options for reducing the risks of HIV transmission to your partner and infant. Please tell me, how interested/not interested you would be in using safer conception services that could protect your partner from HIV infection when you are trying to get pregnant.

Probes:

- If SC options were available in clinics, how likely would you be to use them?
- What would be your level of comfort in going to a HC to seek those services before becoming pregnant?

9. If we were to create services at health centers in Botswana to support SC, what services would you want or need?

Probes:

- What would the ideal SC services look like or include?
- Where should SC services be offered?
- How should these services be offered? Is it better for services to be integrated in regular care or separate?
- Who should offer these services? (For example - staffed by doctors, nurses, others?)
- What would be the most important thing in creating these services?
- How can we reach women when they are not yet pregnant, but they might be considering a pregnancy?
- When should these services be offered?

10. If SC methods became available at a clinic near you, what kind of things would help you/ make it easier to use SC methods? What kind of things would make it harder to use SC services? What things keep people from using SC services?

Probes:

- Partner involvement? Navigating health services? Frequent reminders from HCWs?
- Availability – hours / location
- Access
- Partner involvement low
- Can you describe any rumors that would prevent people from coming for these services?

VII. Closing question

Goal: To end the focus group on a positive note.

11. You have provided us with a lot of very important information today. Our last request is to tell us more about your experience of being a mother/father/ parent. Please tell us what you like about being a parent?

VIII. Conclusion of Focus Group

Thank you again for this very helpful information. Before we go today I would like to give everyone the opportunity to share with me any other thoughts you have about being a parent, pregnancy planning, stigma, or safer conception.

Do any of you have anything else to add that would help us to understand these topics better?

Appendix 3: Focus Group Discussion Cards

Vaginal insemination during the fertile period

- Semen from an HIV-negative man is collected in a condom or cup
- Then, in a syringe, the semen is taken from the condom/cup and gently placed inside the woman
- Usually done at home.



Skills needed

- Start discussion with partner
- Engage partner in using method
- Partner disclosure
- Start discussion with healthcare worker
- Ability to plan for pregnancy
- Understanding of fertile days
- Ability to get to health center
- Engagement with HIV care services
- Confidence that you can use this method

Antiretroviral therapy (ARVs)

- Treating the HIV-positive partner with ARVs
- Checking their HIV viral load to make sure it is very low or 'undetectable'
- Then the couple has sex without a condom during the days during the woman's cycle when she is most likely to get pregnant



Skills needed

- Ability to plan for pregnancy
- Treatment adherence skills
- Engagement with HIV care to check viral load
- Starting discussion with healthcare provider
- Starting discussion with partner
- Understanding of fertile days
- Confidence that you can use this method
- Navigating access to health center for ARVs

PrEP (Pre-exposure prophylaxis)

- Treating the HIV-negative partner with ARV pills called pre-exposure prophylaxis, or PrEP, during the time they are trying to get pregnant
- Couple has sex without a condom during the days during a woman's cycle when she is most likely to get pregnant



Skills needed

- Ability to plan for pregnancy
- PrEP adherence for negative partner
- Access to PrEP services and PrEP care
- Partner disclosure
- Starting discussion with healthcare provider
- Understanding of fertile days
- Confidence that you can use this method

Timed unprotected intercourse

- Every month during a woman's cycle, there are a few days when she is most fertile (most likely get pregnant).
- A woman can track her cycle to figure out the days when she is most likely to get pregnant.
- A couple then has sex without a condom during those days to try and increase the chance of getting pregnant.



Skills needed

- Ability to plan for pregnancy
- Understanding of fertile days
- Starting discussion with healthcare provider
- Starting discussion with partner/ negotiating condom use
- Confidence that you can use this method

Voluntary Medical male circumcision (VMMC)

- HIV-negative men have a surgical procedure where the foreskin of the penis is removed. This can reduce the chance of the man getting HIV during unprotected sex.
- Men choosing this method will need to wait at least 6 weeks after VMMC before having sex.



Skills needed

- Start discussion with partner
- Engage partner in using method
- Partner disclosure
- Ability to get to health center
- Confidence that you can use this method

Appendix 4: Safer Conception Client Questionnaire - Factors Associated with Safer Conception Uptake by people living with HIV in Gaborone Botswana

Before we begin, let me remind you that there are no right or wrong answers. Women respond to these questions in many different ways. You will not be judged based on your responses.

Qs. #	Item	Responses	Code for DE
A1	Interviewer Initials		
A2	Date of Interview	DD/MM/YYYY	
A3	Participant ID Number		
A4	Recruitment location		
A5	Has the Participant completed the informed consent process?	1= Yes 0= No <i>If No, complete consent before proceeding</i>	
Demographic & socioeconomic characteristics			
1.	How old are you? <i>To interviewer – if not known, ask client to estimate.</i>	Age in years	
2.	Where is your current area of residence?	1= City 2= Town 3= Urban village 4= Rural area	
3.	What is the highest level of education that you completed?	(Enter 0 for no formal schooling) 1= Pre-primary 2= Primary 3= Secondary 4= Certificate 5= Diploma 6= Degree 7= Post graduate	
4.	Are you currently employed?	1= Yes 0= No	
5.	What is your main source of income?	1= Wage work 2= Casual work 3= Spouse/ Partner 4= Small business owner 5= Other, specify: _____ _____	
Relationship and partner characteristics			
6.	Are you currently in a romantic relationship with someone?	1= Yes 0= No (Go to Qs. #12)	

Qs. #	Item	Responses	Code for DE
7.	A. What is your relationship status with your primary partner?	1= Married and living together 2= Married and not living together 3= Living together but not married 4= In a relationship but not living together 5= Separated/ divorced (Go to Qs. 12) 6= Chose not to answer (Go to Qs. 9) 7= Other, specify: _____	
8.	<i>INTERVIEWER: If you are in a relationship... I would like to ask you a few questions about your partner / spouse.</i>		
	How old is your primary partner / spouse?	Age in years (if unknown, enter 99)	
9.	A. Do you know the HIV status of your partner/spouse?	1= Yes 0= No, don't know HIV status (Go to Qs. #10)	
	B. If yes, what is their HIV status?	0= HIV-positive 1= HIV-negative 9= Unsure/ Don't know	
10	Have you disclosed your HIV-positive status to your current primary partner?	1= Yes 0= No	
11	Do you have children with your current primary partner?	1= Yes 0= No	
Sexual History and Pregnancies			
12	How old were you when you got pregnant for the first time?	Enter age (if never pregnant, enter 0, and go to Qs. #16)	
13	How many pregnancies have you had in total?	Enter number	
14	How many living biological children of your own do you have?	Enter number	
15	When were you last pregnant?	Enter Year	
HIV History			
16	In what year were you diagnosed with HIV?	Enter year and year / month if in 2018	
17	A. Are you currently taking ART?	1= Yes 0= No (Go to Qs.# 18)	
	B. How long have you been taking ART?	Enter year	
	C. Have you been told that you are currently virally suppressed or undetectable?	1= Yes 0= No 9= Not sure	
	D. Which antiretroviral medications are you currently taking?		
18	Have you become pregnant since being diagnosed with HIV?	1= Yes 0= No 9= Never been pregnant (Go to Qs. #20)	

Qs. #	Item	Responses	Code for DE
19	Have you ever been enrolled in or used PMTCT during a pregnancy?	1= Yes 0= No	
Fertility desires and future Intentions			
20	Do you want to become pregnant within the next year?	1= Definitely not 2= Probably not 3= Probably yes (Go to Qs. 22) 4= Definitely yes (Go to Qs. 22) 5= Don't know 6= Refused	
21	A. Do you want to have more children at any time in the future?	1= Yes 0= No (Go to Qs. #24) 9= Not Sure (Go to Qs. #24)	
	B. If yes, when would you like your next child?	1=Within the next year 2=Within the next two years 3=Within the next 3 to 5 years 4=Other, specify: _____ _____	
22	Does your main partner want you to become pregnant in the next year?	1= Definitely not 2= Probably not 3= Probably yes 4= Definitely yes 5= Don't know 6= Refused 7= No partner	
23	In the next year, how happy would you be if you got pregnant?	1= Very happy 2= Somewhat happy 3= Somewhat unhappy 4= Not happy at all 5= Don't know 6= Refused	
24	Have you ever had an unintended pregnancy? (A pregnancy that happened at the wrong time – too soon, later than you wanted?)	1= Yes 0= No	
Pregnancy Planning – Prospective London Measure of Unplanned Pregnancy			
INTERVIEWER: I would now like to ask you some questions that ask about your feelings about becoming pregnant.			
25	A. In the last month, how would you describe your use of contraception? Would you say that:	1= You have not used contraception 2= You have been using contraception, but not on every occasion (like you sometimes used condoms or you missed some pills) 3= You always have been using contraception, but know that the method failed at least once (i.e. condom broke, moved, came off, came out, not worked, etc.) 4= You always have used contraception [Don't read options below] 5 = Don't know 6 = Refused	

Qs. #	Item	Responses	Code for DE
	B. If you found out that you were pregnant now, would you feel that the pregnancy happened at the...	1= Right time 2 = OK, but not quite right time 3 = Wrong time [Don't read options below] 4 = Don't know 5 = Refused	
	C. How would you describe your intention to get pregnant? Would you say that:	1= You intend to get pregnant 2= Your intentions keep changing 3= You do not want to become pregnant [Don't read options below] 4 = Don't know 5 = Refused	
	D. How would you describe your feelings about having a baby now? Would you say that:	1= You want to have a baby 2= You have mixed feelings about having a baby 3= You do not want to have a baby [Don't read options below] 4 = Don't know 5 = Refused	
	E. <i>In the next question, please think about your main partner - this might be your husband, boyfriend, a partner you live with, or the main person you have sex with/ someone you've had sex with.</i> Would you say that ...	1= You and your partner have agreed for you to become pregnant 2= You and your partner have agreed that you should not become pregnant 3= You and your partner have discussed having children together, but have not come to an agreement 4= You have never discussed having children together [Don't read options below] 5= Don't know 6= Refused 7= NA (don't have main partner)	
	F. Are you doing anything to improve your health <u>in preparation for pregnancy</u> ? Are you:	<i>(Please circle all that apply)</i> 0= No 1= Taking folic acid 2= Stopping or cutting down on smoking 3= Stopping or cutting down on drinking alcohol 4= Eating more healthily 5= Seeking medical/health advice 6= Taking some other action, please describe _____ _____	

Reproductive Autonomy scale

	<p>The next questions are about you and your main partner. The questions ask about who has the most say in different types of decisions. "Most say" means if there was a disagreement, the person who would have final say. If you have more than one partner, think about your main partner. If you don't have a partner, think about a previous partner. If you have not had to make any of the following decisions, please think about who would have the most say in the decision.</p> <p>For these questions, please select one of the following response choices: My sexual partner (or someone else such as a parent/mother in-law/father in-law); Both me and my sexual partner (or someone else such as a parent/mother in-law /father in-law) equally; Me.</p>	
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Qs. #	Item	Responses	Code for DE	
26	Decision-making sub-scale			
	A	Who has the most say about whether you use a method to prevent pregnancy? 	1= My sexual partner 2= Both me and my sexual partner equally 3= Me 4= Other, Specify: _____ _____	
	B	Who has the most say about which method you would use to prevent pregnancy?	1= My sexual partner 2= Both me and my sexual partner equally 3= Me 4= Other, Specify: _____ _____	
	C	Who has the most say about <u>when</u> you have a baby in your life?	1= My sexual partner 2= Both me and my sexual partner equally 3= Me 4= Other, Specify: _____ _____	
27	Freedom from coercion sub-scale			
	The next questions are about you and your main partner. For these questions, please select one of the following response choices: Strongly Disagree, Disagree, Agree, Strongly Agree			
	A	My partner has messed with or made it difficult to use a method to prevent pregnancy when I wanted to use one.	1= Strongly agree 2= Agree 3= Disagree 4= Strongly disagree	
	B	My partner has made me use a method to prevent pregnancy when I did not want to use one.	1= Strongly agree 2= Agree 3= Disagree 4= Strongly disagree	
	C	If I wanted to use a method to prevent pregnancy my partner would stop me.	1= Strongly agree 2= Agree 3= Disagree 4= Strongly disagree	
	D	My partner has pressured me to become pregnant.	1= Strongly agree 2= Agree 3= Disagree 4= Strongly disagree	
28	Communication sub-scale			
	The next questions are about communication between you and your main partner. For these questions, please select one of the following response choices: Strongly Disagree, Disagree, Agree, Strongly Agree			
	A	My partner would support me if I wanted to use a method to prevent pregnancy.	1= Strongly agree 2= Agree 3= Disagree 4= Strongly disagree	

Qs. #	Item	Responses	Code for DE
	B It is easy to talk about sex with my partner.	1= Strongly agree 2= Agree 3= Disagree 4= Strongly disagree	
	C If I didn't want to have sex I could tell my partner.	1= Strongly agree 2= Agree 3= Disagree 4= Strongly disagree	
	D If I was worried about being pregnant or not being pregnant I could talk to my partner about it.	1= Strongly agree 2= Agree 3= Disagree 4= Strongly disagree	
	E If I really did not want to become pregnant I could get my partner to agree with me.	1= Strongly agree 2= Agree 3= Disagree 4= Strongly disagree	
	History of abuse / Intimate Partner Violence		
	<i>These next questions are about things happen to many women, and that your current partner or any other partner may have done. I will read you a list of actions. Please tell me if your current partner or any other partner has ever done the following things to you.</i>		
29	A How many times has a current or previous partner insulted you or made you feel bad about yourself?	1= Never (Go to Qs. 30) 2= Once 3= A few times 4= Many times	
	B How many times has this happened in the past 12 months?	1= Never 2= Once 3= A few times 4= Many times	
30	A How many times has a current or previous partner threatened to hurt you or someone you care about?	1= Never (Go to Qs. 31) 2= Once 3= A few times 4= Many times	
	B How many times has this happened in the past 12 months?	1= Never 2= Once 3= A few times 4= Many times	
31	A How many times has a current or previous partner ever slapped you or thrown something at you which could hurt you?	1= Never (Go to Qs. 32) 2= Once 3= A few times 4= Many times	
	B How many times has this happened in the past 12 months?	1= Never 2= Once 3= A few times 4= Many times	
32	A How many times has a current or previous partner ever pushed or shoved you?	1= Never (Go to Qs. 33) 2= Once 3= A few times 4= Many times	
	B How many times has this happened in the past 12 months?	1= Never 2= Once 3= A few times 4= Many times	

Qs. #	Item	Responses	Code for DE
33	A	How many times has a current or previous partner ever hit you with a fist or with something else that could hurt you?	1= Never (Go to Qs. 34) 2= Once 3= A few times 4= Many times
	B	How many times has this happened in the past 12 months?	1= Never 2= Once 3= A few times 4= Many times
34	A	How many times has a current or previous partner ever kicked, dragged, beaten, choked or burnt you?	1= Never (Go to Qs. 35) 2= Once 3= A few times 4= Many times
	B	How many times has this happened in the past 12 months?	1= Never 2= Once 3= A few times 4= Many times
35	A	How many times has a current or previous partner ever physically forced you to have any type of sex when you did not want to?	1= Never (Go to Qs. 36) 2= Once 3= A few times 4= Many times
	B	How many times has this happened in the past 12 months?	1= Never 2= Once 3= A few times 4= Many times
36	A	How many times have you ever had sex with a current or previous partner when you did not want to because you were afraid that he might become violent?	1= Never (Go to Qs. 37) 2= Once 3= A few times 4= Many times
	B	How many times has this happened in the past 12 months?	1= Never 2= Once 3= A few times 4= Many times
Safer Conception Information			
37	Awareness of SC methods		
	Now, I will read you a series of statements. Please tell me if you think each statement is true or false.		
	A. It is possible for an HIV-positive woman to have an HIV-negative baby.	1= True 0= False 9= Don't Know	
	B. HIV antiretroviral medications can reduce the risk of passing HIV to a baby.	1= True 0= False 9= Don't Know	
	C. There are ways to make conception with an HIV-positive partner safer.	1= True 0= False 9= Don't Know	
	D. There are ways to make conception with an HIV-negative partner safer.	1= True 0= False 9= Don't Know	
	E. All options to make conception safer are very expensive.	1= True 0= False 9= Don't Know	

Qs. #	Item	Responses	Code for DE
	F. Waiting until one's CD4 count is higher will reduce the risk of health complications to the mother during pregnancy.	1= True 0= False 9= Don't Know	
	G. Having a sexually transmitted infection will increase the risk of passing HIV to an uninfected partner during unprotected sex.	1= True 0= False 9= Don't Know	
	H. There are times during a woman's cycle when she is most fertile (likely to become pregnant).	1= True 0= False 9= Don't Know	
	I. Healthcare providers can offer advice to help make childbearing safer for women, their partners, and their children.	1= True 0= False 9= Don't Know	
	J. If an HIV-positive person has an undetectable amount of HIV virus, it means that person is no longer able to infect someone else.	1= True 0= False 9= Don't Know	
	K. For some couples, having the man ejaculate into a condom or container and then manually inject the semen into the woman's vagina is a way to reduce risk of HIV transmission if the man is HIV-negative.	1= True 0= False 9= Don't Know	
	L. Only having unprotected sex during the few days each month when the woman is most fertile will help to reduce the risk of HIV transmission to an uninfected partner.	1= True 0= False 9= Don't Know	
	M. There is technology available that can cleanse a man's sperm or semen of the HIV virus.	1= True 0= False 9= Don't Know	
	N. Starting to take HIV medications early (as soon as diagnosed) helps reduce the risk of transmitting HIV to a sexual partner.	1= True 0= False 9= Don't Know	
	O. HIV medications can be taken by an HIV-positive partner who wants to conceive with an HIV-negative partner in order to reduce the chance of transmitting HIV to the negative partner.	1= True 0= False 9= Don't Know	
	P. HIV medications can be taken by an HIV-negative (or unknown status) partner that will reduce their risk of getting infected by their HIV-positive partner.	1= True 0= False 9= Don't Know	
	Q. An HIV-negative man can be circumcised as a way to reduce the chance of the man getting HIV during unprotected sex when a couple is trying to get pregnant.	1= True 0= False 9= Don't Know	
Motivation to use SC			
38	On a scale of 1 (strongly disagree) to 4 (strongly agree), please rate your level of agreement with each of the following statements.		

Qs. #	Item	Responses	Code for DE
	A. It is important to me to work with a healthcare provider to plan a pregnancy	1= Strongly disagree 2= Disagree 3= Agree 4= Strongly agree	
	B. I'm confident a healthcare provider can be helpful to me and my partner in trying to have a child safely	1= Strongly disagree 2= Disagree 3= Agree 4= Strongly agree	
	C. I am ready to temporarily delay getting pregnant if it helps me to have a child more safely	1= Strongly disagree 2= Disagree 3= Agree 4= Strongly agree	
	D. I am confident that I can get quality health care services.	1= Strongly disagree 2= Disagree 3= Agree 4= Strongly agree	
Partner desires / partner willingness to use SC			
39	How important do you think it is to your partner that you have children/ more children together? (read all options)	1= Very important 2= Important 3= Somewhat important 4= Not very important 5= Don't know	
40	Partner willingness to use SC scale On a scale of 1 (no confidence) to 5 (high confidence), please rate your confidence in your partner's willingness to do the items described:		
	A. Your partner would attend a doctor visit with you to learn about safer ways to conceive a child	1= No confidence 2 3 4 5= High confidence	
	B. Your partner would be open to trying methods to reduce HIV transmission risks during conception	1= No confidence 2 3 4 5= High confidence	
	C. Your partner would be willing to wait to have unprotected sex until your/both of your CD4 counts are at a high level	1= No confidence 2 3 4 5= High confidence	
Behavioural skills to use SC			
41	A. Have you ever had a discussion with a healthcare provider about preventing pregnancy?	1= Yes 0= No	
	B. How certain are you that you could start discussions with a healthcare provider about preventing pregnancy?	1= I cannot do this at all 2= I probably cannot do it 3= I probably can do it 4= I can definitely do this	
42	A. Have you ever had a discussion with a healthcare provider about wanting to become pregnant?	1= Yes 0= No	

Qs. #	Item	Responses	Code for DE
	B. How <u>certain are you</u> that you could start discussions with a healthcare provider about wanting to become pregnant?	1= I cannot do this at all 2= I probably cannot do it 3= I probably can do it 4= I can definitely do this	
43	A. Have you <u>ever had</u> a discussion with a healthcare provider about how to make conception safer if you want to become pregnant in the future?	1= Yes 0= No	
	B. How <u>certain are you</u> that you could start discussions with a healthcare provider about ways to make conception safer if you wanted to become pregnant in the future?	1= I cannot do this at all 2= I probably cannot do it 3= I probably can do it 4= I can definitely do this	
44	A. Have you and your current partner <u>ever</u> talked to each other about wanting to have children together?	1= Yes 0= No	
	B. How <u>certain are you</u> that you could start discussions with your partner about having children together?	1= I cannot do this at all 2= I probably cannot do it 3= I probably can do it 4= I can definitely do this	
45	A. Have you and your current partner <u>ever</u> talked about ways to make conception safer if you wanted to become pregnant in the future?	1= Yes 0= No	
	B. How <u>certain are you</u> that you could start discussions with your partner about ways to make conception safer if you wanted to become pregnant in the future?	1= I cannot do this at all 2= I probably cannot do it 3= I probably can do it 4= I can definitely do this	
46	A. Have you <u>ever</u> taken steps to improve your health before becoming pregnant?	1= Yes 0= No	
	B. How <u>certain are you</u> that you could take steps to improve your health before becoming pregnant?	1= I cannot do this at all 2= I probably cannot do it 3= I probably can do it 4= I can definitely do this	
	Self efficacy to use SC On a scale of 1 (can't do at all) to 4 (certain I can do), please rate your confidence in your ability to do the items described:		
47	A. I can follow advice about postponing attempts to conceive until any sexually transmitted infections are treated	1= I cannot do this at all 2= I probably cannot do it 3= I probably can do it 4= I can definitely do this	
	B. I can follow advice about limiting unprotected sex to only 2-3 specific days per month	1= I cannot do this at all 2= I probably cannot do it 3= I probably can do it 4= I can definitely do this	
	C. I can learn how to track the most fertile days in a woman's cycle	1= I cannot do this at all 2= I probably cannot do it 3= I probably can do it 4= I can definitely do this	

Qs. #	Item	Responses	Code for DE
	<p>Previous Safer Conception services experiences</p> <p><i>INTERVIEWER: Only ask these questions if the woman living with HIV has had a pregnancy since being diagnosed with HIV! If not, go to question 53!</i></p> <p>Now I want you to think about the last time you became pregnant, which you said was ___ months/years ago when you were pregnant with your _____ (first/ second/ third/ etc.) child. When I ask you the next set of questions, please think about that most recent pregnancy.</p>		
48	Before you got pregnant, did you talk with a <u>healthcare provider</u> about wanting to get pregnant?	1= Yes 0= No	
49	Before you got pregnant, did you talk with a <u>healthcare provider</u> about ways to make conception safer?	1= Yes 0= No	
50	Before you got pregnant, did you talk with your <u>partner</u> about getting pregnant?	1= Yes 0= No	
51	Before you got pregnant, did you talk with your <u>partner</u> about ways to protect them from HIV transmission when trying to conceive?	1= Yes 0= No	
52	Now I will ask you about some things that people may or may not do when they want to make conception safer. Before your last pregnancy, did you do any of these things because you knew that you wanted to get pregnant?		
	A. Did you have unprotected sex only on the 2-3 specific days each month in which you were most fertile? [Timed unprotected intercourse]	1= Yes 0= No 9= Not sure/ Don't know	
	B. Did you pay for technology that cleanses your partners sperm/semen of the HIV virus? [sperm washing]	1= Yes 0= No 9= Not sure/ Don't know	
	C. Did your partner ejaculate into a condom or container and then manually inject the semen into your vagina? [manual vaginal insemination]	1= Yes 0= No 9= Not sure/ Don't know	
	D1. Did you take ARV medications in order to be virally suppressed/ undetectable while you and your partner were trying to conceive? [treatment adherence]	1= Yes 0= No 9= Not sure/ Don't know	
	D2. Did you specifically check your viral load to make sure it was undetectable/ suppressed before trying to get pregnant?	1= Yes 0= No 9= Not sure/ Don't know	
	E. If your partner was HIV-negative, did they take HIV medication, known as PrEP, every day during the months in which you were trying to conceive? [PrEP]	1= Yes 0= No 9= Not sure/ Don't know	
	F. Did your partner undergo male circumcision specifically as a way to reduce possible HIV transmission because you were trying to get pregnant? [MMC]	1= Yes 0= No 9= Not sure/ Don't know	

Qs. #	Item	Responses	Code for DE
	G. Did you do anything else?	1= Yes, please describe: _____ _____ 0= No	
Intention to use safer conception services			
53	If services were available in clinics to help make conception safer for HIV-affected couples who want to have children, how likely do you think you would be to use these services?	1= Very unlikely 2= Unlikely 3= Likely 4= Very likely 9= Not sure/ Don't know	
Barriers and Facilitators			
54	<p>Some women may want to use safer conception methods, but they feel they don't have the help they need to be able to use them.</p> <p>What follows here is a list of things that might help couples to use safer conception methods. In your opinion, which of these things would help you to use safer conception services?</p> <p>Interviewer read all options listed and circle answers.</p>	1= Having health workers educate you about SC approaches 2= Having PLHIV teach you about SC approaches 3= Offering SC methods within HIV care services 4= Offering SC as a separate stand-alone service 5= Teaching the community about SC (example: through educational health talks) 6= Having educational materials about SC methods available in health centers 7= Anything else: _____ _____	
55	<p>Next I will read you a list of some things that might make it difficult to use SC methods. In your opinion, what things would make it hard for you to use safer conception?</p> <p>Interviewer read all options listed and circle answers.</p>	1= My partner not agreeing to use SC method 2= Fear of disclosing my HIV status to my partner 3= Shortage of healthcare workers with time to discuss these issues 4= Stigma from healthcare workers about PLHIV having children 5= Confusion about how certain methods work 6= Lack of information about SC methods 7= Fear of discussing SC with healthcare workers 8= Anything else: _____ _____	
Experiences/ attitudes about HCWs			
56	Would you <u>want</u> to have discussions with a healthcare provider about ways to make conception safer if you wanted to become pregnant in the future?	1=Yes 0=No 9= Not sure	

Qs. #	Item	Responses	Code for DE
57	Who should start discussions about safer conception?	1= Women living with HIV 2= Healthcare providers 3= Both women and healthcare providers should start these conversations 4= Neither 5= Don't know/ not sure	
58	How much do you agree with this statement? Most HIV providers think that women living with HIV should not have children.	1= Strongly disagree 2= Disagree 3= Neither agree or disagree 4= Agree 5= Strongly Agree	
HIV-related Stigma			
59	Anticipated HIV stigma For each question, please tell us, on a scale of 1 (Very unlikely) to 5 (Very likely), how likely is it that people will treat you in the following ways in the future because of your HIV status?		
	A. Family members will avoid me.	1= Very unlikely 2= Unlikely 3= Neither Unlikely nor likely 4= Likely 5= Very likely	
	B. Family members will treat me differently.	1= Very unlikely 2= Unlikely 3= Neither Unlikely nor likely 4= Likely 5= Very likely	
	C. Healthcare workers will not take my needs seriously.	1= Very unlikely 2= Unlikely 3= Neither Unlikely nor likely 4= Likely 5= Very likely	
	D. Healthcare workers will discriminate against me.	1= Very unlikely 2= Unlikely 3= Neither Unlikely nor likely 4= Likely 5= Very likely	
	E. Healthcare workers will be upset with me if I get pregnant.	1= Very unlikely 2= Unlikely 3= Neither Unlikely nor likely 4= Likely 5= Very likely	
60	Internalized childbearing stigma For each question, please tell us, on a scale of 1 (Disagree strongly) to 5 (Agree strongly), how much you agree with each of the following statements?		
	A. I feel ashamed for wanting to have a child	1= Disagree strongly 2= Disagree 3= Neutral 4= Agree 5= Agree strongly	

Qs. #	Item	Responses	Code for DE
	B. I feel selfish for wanting to have a child	1= Disagree strongly 2= Disagree 3= Neutral 4= Agree 5= Agree strongly	
61	Perceived community stigma We would like to assess your perception of community stigma surrounding pregnancy and childbearing in HIV-affected couples. For each question, please tell us, on a scale of 1 (Disagree strongly) to 5 (Agree strongly), how much you agree with each of the following statements.		
	A. People in the community look down on HIV-positive individuals who want to have a child.	1= Disagree strongly 2= Disagree 3= Neutral 4= Agree 5= Agree strongly	
	B. An HIV-positive man who gets his partner pregnant is looked down upon.	1= Disagree strongly 2= Disagree 3= Neutral 4= Agree 5= Agree strongly	
	C. An HIV-positive woman who gets pregnant is looked down upon.	1= Disagree strongly 2= Disagree 3= Neutral 4= Agree 5= Agree strongly	
Contraceptives			
62	Please tell me all the methods you are currently using to prevent pregnancy (i.e., contraception or family planning methods you are currently using)? INTERVIEWER: Circle all that are mentioned!	0 = None 1= The pill – progestin only (POP) 2= The pill – combined pill 3= The pill - unspecified 4= The injectable 5= Implant – 3 year 6= Implant - 5 year 7= IUD - Copper 8= IUD - Mirena 9= Vaginal ring 10= Male condom 11= Female condom 12= Female sterilization 13= Male sterilization 14= LAM 15= Other (specify) _____ _____	
63	Did a healthcare provider at this visit ask you about or talk to you about your plans for having (more) children in the future?	1= Yes 0= No 9= Not Sure	
64	Did a healthcare provider at this visit ask you about or talk to you about contraception?	1= Yes 0= No 9= Not Sure	
65	Since your HIV diagnosis, which contraceptive methods have healthcare providers suggested you use?	0 = None 1= The pill – progestin only (POP) 2= The pill – combined pill 3= The pill - unspecified 4= The injectable	

Qs. #	Item	Responses	Code for DE
	INTERVIEWER: Circle all that are mentioned!	5= Implant – 3 year 6= Implant - 5 year 7= IUD - Copper 8= IUD - Mirena 9= Vaginal ring 10= Male condom 11= Female condom 12= Female sterilization 13= Male sterilization 14= LAM 15= Other (specify) _____ _____	
Conclusion			
66	Do you have any questions or issues you would like to discuss regarding pregnancy planning or safer conception?	1= Yes 0= No	
67	What specific issues would you like to discuss?		
This is the end of the interview. Thank you for your time.			