



Published in final edited form as:

Cult Health Sex. 2013 November ; 15(10): . doi:10.1080/13691058.2013.811289.

Fertility intentions among HIV-infected, sero-concordant Kenyan couples in Nyanza Province, Kenya

Mellissa Withers¹, Shari Dworkin², Elizabeth Harrington³, Zachary Kwena³, Maricianah Onono⁴, Elizabeth Bukusi⁴, Craig R. Cohen⁵, Daniel Grossma⁶, and Sara J. Newmann⁷

Mellissa Withers: mellwit@yahoo.com

¹University of California at Los Angeles, Department of Anthropology, Los Angeles, CA, USA

²University of California at San Francisco, School of Nursing, Department of Social and Behavioral Sciences, San Francisco, CA USA

³Oregon Health & Science University, Department of Obstetrics and Gynecology, Portland, OR, USA

⁴Kenyan Medical Research Institute, Center for Microbiology Research, Nairobi, Kenya

⁵University of California at San Francisco, Department of Obstetrics, Gynecology and Reproductive Sciences, San Francisco, CA USA; Center of Expertise in Women's Health & Empowerment, University of California Global Health Institute

⁶Ibis Reproductive Health, Oakland, CA USA

⁷University of California at San Francisco, School of Medicine, Department of Obstetrics and Gynecology, San Francisco, CA USA

Abstract

Research in sub-Saharan Africa has shown significant diversity in how HIV influences infected couples' fertility intentions. Supporting HIV-infected, sero-concordant couples in sub-Saharan Africa to make informed choices about their fertility options has not received sufficient attention. In-depth interviews were conducted among 23 HIV-positive, sero-concordant married couples in Kenya, to better understand how HIV impacted fertility intentions. HIV compelled many to reconsider fertility plans, sometimes promoting childbearing intentions in some individuals but often reducing fertility plans among most, largely due to fears of early death, health concerns, stigma, perinatal HIV transmission and financial difficulties (particularly in men). Preferences for sons and large families influenced some couples' intentions to continue childbearing, although none had discussed their intentions with health care providers. Additional support and services for HIV-infected, sero-concordant couples are needed. Family planning counselling should be tailored to the unique concerns of HIV-infected couples, addressing perinatal transmission but also individual, couple-level, and socio-cultural fertility expectations. Community-level programmes are needed to reduce stigma and make HIV-infected couples more comfortable in discussing fertility intentions with health care providers.

Keywords

Africa; HIV/AIDS; reproductive health; pregnancy; Kenya

Introduction

Sub-Saharan Africa is the centre of the global HIV epidemic: 69 percent of people living with HIV/AIDS worldwide reside here and 70 percent of the world's AIDS-related deaths in 2011 took place in this region (UNAIDS 2012). Fifty-eight percent of HIV-infected individuals in sub-Saharan Africa are women, accounting for over 13 million women (UNAIDS 2012). In 2011, 92 percent of pregnant women living with HIV and more than 90 percent of the children that acquired HIV worldwide lived in sub-Saharan Africa (UNAIDS 2012).

There is growing recognition of the complex reproductive decisions faced by HIV-infected women and men worldwide. The increasing accessibility of antiretroviral therapy (ART) has prolonged life expectancy, potentially impacting fertility intentions among HIV-infected individuals. While there has been a major emphasis on preventing perinatal transmission, providing access to ART, and promoting family planning among HIV-infected women and sero-discordant couples, understanding the reproductive intentions of HIV-infected sero-concordant couples has received less attention. Few studies have explored how an HIV diagnosis impacts the fertility goals of HIV-infected men and/or couples. Furthermore, existing research has shown considerable diversity among HIV-infected women's childbearing intentions, suggesting that HIV can have both negative and positive effects on fertility desires, depending on the context. Evidence indicates that many HIV-infected individuals in African countries continue to desire and bear more children after diagnosis (Harries et al. 2007; Maier et al. 2009; Kaida et al. 2011; MacCarthy et al. 2012; Mmbaga et al. 2013). However, other studies from Uganda, (Nakayiwa et al. 2006), South Africa (Laher et al. 2009; Kaida et al. 2011), Kenya (Magadi et al. 2010), Malawi (Hoffman et al. 2008; Yeatman 2009) and Zimbabwe (Feldman and Maposhere 2003) have found that most women intend to stop childbearing after an HIV diagnosis.

The literature has provided insight into why HIV-infected individuals may want to stop childbearing, including the possibility of perinatal HIV transmission (London et al. 2007; Laher et al. 2009; Nattabi et al. 2009), the potential transmission of HIV, or reinfection, to a partner during unprotected sex (London et al. 2007; Cooper et al. 2009; Laher et al. 2009), anxiety about leaving a child an orphan for others to care for, or worry about the child's future welfare (Feldman and Maposhere 2003, Rutenberg et al. 2000; Myer et al. 2007) and the perception that pregnancy will cause an acceleration of HIV or even death during pregnancy or childbearing (Rutenberg et al. 2000; Cooper et al. 2009; Nattabi et al. 2009). In sub-Saharan Africa, cultural beliefs and practices have been shown to be critical determinants of fertility intentions and one's ability to prevent pregnancy if desired (Cooper et al. 2007; Nattabi et al. 2009; Kaida et al. 2011).

The majority of the studies among HIV-infected individuals in sub-Saharan Africa have examined the factors that contribute to the intention to stop childbearing. Few studies have considered what may promote childbearing in such individuals, especially among HIV-infected, sero-concordant couples. In addition, while most studies of fertility intentions among HIV-infected individuals have focused on women, little research exists on HIV-infected men or couples' fertility intentions following HIV diagnosis. Further understanding of fertility decision-making processes and the impact that HIV infection has on HIV-infected, sero-concordant couples is needed in order to adequately address the reproductive health needs of *all* couples. In addition, due to stigma associated with childbearing among HIV-infected couples, HIV-infected, sero-concordant couples may be reluctant to discuss their fertility goals with others, including health care providers. This study examined the fertility intentions of HIV sero-concordant couples in Nyanza province, Kenya in order to explore the factors that influenced their reproductive decision-making.

Methods

The present study was conceived after analysing baseline data among HIV providers from a cluster randomized trial evaluating the impact of integrating family planning services into HIV care and treatment in Nyanza province (Clinical Trials #NCT01001507). The study revealed that HIV providers believe that decisions relating to family planning are strongly influenced by women's and providers' perceptions of male partners' fertility desires and beliefs, even though men are generally absent from family planning visits (Newmann et al. 2013). The study above and the current study was conducted in conjunction with Family AIDS Care and Education Services (FACES). FACES was initiated in March 2005 and is a collaboration between the Kenya Medical Research Institute (KEMRI) and the University of California, San Francisco (UCSF). FACES partners with government health facilities to provide HIV care, treatment, and support to individuals and families in the Nyanza province (Lewis-Kulzer et al. 2012). FACES supports 130 HIV care sites providing HIV care to approximately 125,000 people in Nairobi and in six districts in Nyanza Province, Kenya. Nyanza province has an overall HIV prevalence of 14 percent, the highest in the country and double the level of the next highest provinces—Nairobi and Western- at 7 percent each. Gender differences in HIV prevalence exist here; it is estimated that 16 percent of women and 11.4 percent of men are HIV-infected (Measure DHS, 2009).

The data for the current study were collected through a research collaboration between the University of California at San Francisco and the Kenyan Medical Research Institute. Semi-structured, in-depth interviews were conducted among 40 married, heterosexual Kenyan couples between June-September 2010. Twenty couples were recruited using a convenience sample of clients at FACES-supported, government-run HIV care and treatment centers in either the Rongo or Migori districts of Nyanza province, Kenya. Eligibility included couples who were: married for at least one year, the female partner was between 18–45 years, at least one member of the couple was HIV-infected and a client at a FACES clinic, and both partners knew the others' HIV status. In addition, both members of the couple had to agree to participate in this study. In order to garner a more diverse range of experiences and minimise selection bias, another twenty couples were recruited through purposive sampling with the assistance of community engagement officers from communities in the same districts. Attempts were made to recruit couples from the community who were demographically similar (age, occupation, religion, etc.) to couples recruited from the FACES clinics. HIV status was not a criterion for selection among couples from the community. For this analysis, only data from HIV-infected, sero-concordant couples from both the clinic and community samples were included (n=23).

The interviews were conducted by local women and men who were trained in qualitative methods and research ethics. Interviewers were matched to the sex of the respondent. Each male and female partner was interviewed separately and simultaneously. The interviews were conducted in the local language (Dholuo) and took approximately one and a half hours to complete. Interviews were audio-taped, transcribed into the local language and were then translated into English. Written informed consent was obtained from each participant prior to the interview. In accordance with the ethical review committee at KEMRI and UCSF, at the conclusion of the interview, participants were offered the equivalent of US\$3 as a reimbursement for their transportation. Study approval was obtained from KEMRI and UCSF.

Transcripts and field notes were analysed using principles of grounded theory (Strauss & Corbin 1994). To establish a codebook, six interviews were randomly selected and independently evaluated using an open coding process employed during the initial phase of coding often deployed in qualitative research (Strauss and Corbin, 1994; Lofland and

Lofland 1995). At least two members of the research team read the transcripts and field notes and developed primary broad thematic categories. From this initial process of broad category generation, an additional six interviews were selected for coding. After a second round of coding, coders met to ensure full refinement of primary and secondary categories. Subsequently, we used Atlas.ti software to examine recurrent patterns within the data and to further develop or refine categories and examine the relationships between them. Final coding schemes were confirmed by members of the research team through a continuous and simultaneous process of coding and analysis.

In the results that follow, we examine fertility intentions among women and men in 23 HIV-infected, sero-concordant couples, specifically addressing how HIV impacted their intentions. We also highlight differences across gender.

Results

Demographic characteristics

The mean age of the study participants was 42 years for men and 32 for women. The average length of marriage was 10 years and approximately 43 percent of the couples were in polygamous marriages. Almost two-thirds of men and women had received less than a primary school education. The mean number of living children was 5.7 among men and 3.7 among women. Although all participants in the analysis were couples, polygamy accounts for the difference in the number of living children reported by male and female subjects. Fifty-four percent of men (n=12) and 68 percent of women (n=15) reported that they did not want any more children. Two men and one woman reported currently wanting a child, while another 7 men and 6 women reported a desire to have more children in the future (See Table 1.)

Thematic analysis

Here we present the major themes that emerged from the interviews, including four themes focusing on why couples had decided to stop childbearing: fear of perinatal transmission, personal or spousal death, reduced financial resources due to the inability to work, and community stigma and health care providers' attitudes regarding childbearing among HIV-infected couples. We also present four themes related to why couples wanted to continue childbearing, which were largely influenced by cultural factors, especially gender roles: desire for sons and replacement of children who have died from HIV, counselling about the prevention of perinatal HIV transmission and pressure from partners.

HIV infection and belief in God's will regarding fertility—The majority of participants stated that an HIV diagnosis obliged them to carefully plan for their own and their children's futures. This had a major impact on their reproductive decisions, including fertility intentions and contraceptive use. Although the majority of respondents reported that a large family was generally preferred, HIV had a dramatic negative effect on many couples' intended fertility. One recurrent theme among both men and women was that they had originally planned to have as many children as God planned for them. Many participants stated that they had changed their minds about wanting a large family after learning they were HIV-infected and had decided to stop childbearing, even if it was against God's will.

“before I realized we are infected, I was thinking of having the children that God would bless me with...so I had set my mind on having six children . I cannot know the number of children that one can have....But I think the four that I have are enough for me now. But if my health was good, then I would have added two to the four....” [Nelly, a 29-year old mother of four]

Most men's narratives echoed women's intention to limit childbearing due to their HIV infection.

"...the number of children I had planned to have at the time that I married is different from what I think now. At that time I wanted to have many children but now I only want to have one more child and the ones that God has already blessed me with." [Ochola, 36 year-old father of three]

However, while most women said they now intended to have fewer children than before their HIV diagnosis, not all women held this view. A few women reported that they still intended to have more children.

"It [HIV] cannot change my mind because of what I have heard about the HIV virus, I have learned a lot about it and now that we have a child I know how I can take care of the life of my child while in the womb and even after she has been born. I know how I can take care of her health so I cannot be afraid of the things I am hearing about." [Nancy, a 24-year old mother of one]

Reasons to stop childbearing

Fear of perinatal transmission—A factor shaping many participants' intentions to stop childbearing or have fewer children was the possibility of giving birth to an HIV-infected baby. Both men and women commonly described these fears as the primary reason they had decided to stop having children. For example, both women and men generally reported themes such as:

"I think that I may get another child and this child will be infected. Therefore we feel that we will be putting that child through torture..." [Benedictus, a 50 year-old father of four]

"The reason why I feel that I am not ready to have a child is that at this time both of us are sick ... So when that child will be born, it will be born with problems. I don't want to give birth to a child with problems; I would rather take care of the ones that are alive." [Truphena, a 30 year-old mother of four]

Even among couples who previously had a child born without HIV despite the mother's HIV-infected status, some men and many women felt that the risk of having an HIV-infected child was too great. Several women who had given birth to a baby that was HIV-negative explained that they believed that God had protected their babies from becoming infected with HIV but were reluctant to continue to rely on God's will to prevent HIV infection among their future children:

"I mean my heart is fearful because the ones that I already have, I am seeing that God protected them and they have not gotten the virus. I am seeing that they have crossed over safely. So, I am fearful that maybe if I conceive again that child may get infected, while these other ones were protected by God and they never got the virus." [Matilda, a 24 year-old mother of five]

Fear of personal and spousal death and leaving orphaned children behind—After receiving their HIV diagnosis, the majority of men and many women reported contemplating their own early deaths and discussed how this impacted their fertility intentions. Both men and women often spoke candidly about their poor health and some were hesitant to have more children because of their concerns that they might not be able to take care of their children in the future. More than half of the participants explained that they weighed their desires to have more children against their fears of leaving their children orphaned at an early age. Men in particular often discussed their worries about saddling

family members with the task of caring for their children after they had died. For example, men generally reported themes such as:

“...these children will remain as orphans and there will be no way they are supporting themselves and you find her still continuing to give birth. There are those who had stopped so you will find that she will leave behind a few and therefore their burden may be lighter for those who will remain behind.” [Zablon, a 26 year-old father of two]

Several women also discussed their fears of early death and explained how this had impacted upon their decisions to stop childbearing.

“now I am seeing that the ones I already have are enough for me. I see that maybe I don’t know when my life will come to an end and some time I may leave them in suffering.” [Roselida, a 37 year-old mother of four]

For some women, concerns about widowhood also factored into their decisions to stop childbearing. They hoped to limit their number of children in case they became widows because they felt that smaller families would be easier to take care of on their own. For example, Dorothy reported that:

“In my view I thought that I would have four children. Life turned out to be very difficult then the two children that I already had were enough because my husband was already weak and bed ridden. So I felt that the two children were enough for me to take care of in case I am widowed.” [Dorothy, a 32 year-old mother of three]

Impact of HIV on finances and personal health on fertility desires—Another common theme was the impact of HIV on participants’ financial stability. HIV contributed to poor health, making it difficult for participants to work. Poor health and decreased energy and ability to work influenced both men and women equally to stop childbearing because they felt they were not healthy enough to take care of their children. For example, Irene said that:

“It has changed my decision [to have more children] because I can also feel that my energy and strength has reduced. In the past I could carry a bucket and a jerrycan [container for storing liquids] of water and maybe I would also have a child strapped on my back. But nowadays if I carry a bucket of water, by the time I get home I feel very tired and I have to rest a little bit...nowadays I cannot rush to do things like I used to.” [Irene, a 32 year-old mother of three]

Among most male participants, waning household income and unstable futures fuelled serious financial concerns because these factors challenged their ability to be a provider for their families, an important role for husbands and fathers to achieve. These monetary fears also influenced their decision-making about having more children.

“I am now afraid because taking care of a child is not easy. Yes, a child needs care, to be taken to school, to have his/ her clothes washed and be fed and all these things are linked to money. So, when this person needs something and the other person also needs something else, the burden will overwhelm you. So, since I am already sick, I felt that it may reach a point that I may not have any more energy...” [Benedictus, a 50 year-old father of four]

Community stigma and health care providers’ attitudes about childbearing among HIV-infected individuals—Further complicating couples’ fertility decision-making, a few participants discussed the stigma in their community associated with childbearing among HIV-infected, sero-concordant couples. Some believed that community

members disapproved of them having children, largely because it was generally assumed that the baby would be born infected and/or that the parents would die soon, leaving another HIV orphan in the community. For example, David, a father of one son reported that:

“The community members think that they [HIV-infected women] will give birth to children who are infected with HIV... they will increase the number of funerals in the community. Because there is nowhere for these children to go, they will have to face death. Secondly, the community members think that when they give birth to children, these women will die; when they die they will leave their family members with the hard work of feeding the orphans. So they feel that when one is infected with the HIV virus, life ends like that.... that one should just rest with the disease and die when his/ her dying time is due.” [David, a 32 year-old father of one]

When asked about how this affected their fertility intentions, most participants said that it had influenced their decisions to stop childbearing. However, a few men and one woman expressed that stigma had not influenced their fertility decisions:

“The community members cannot change me.... a child is between you and your God and what you desire.” [Sulman, a 45 year-old father of thirteen]

“There is nothing they [community members] have said that has changed my mind and there is no other way that their words can change my mind about having a baby or having the HIV Virus. Because when I look at my life, I see that there is medication that can prolong my life if I am infected with the HIV Virus. If I follow the correct instructions as far as the medication is concerned during the pregnancy and if I go to the clinic even after delivery, I can have a healthy baby. That gives me the courage that I can have my baby.” [Nancy, a 24 year-old mother of one]

The vast majority of men and women stated that they had been strongly encouraged by their health care providers to stop childbearing. They reported that their health care providers had urged them to use condoms to prevent re-infection and future pregnancies. Few participants mentioned that their health care providers had offered them contraceptive choices other than condoms and no one reported having discussed their fertility preferences or intentions to have more children with health care providers. A few participants perceived that health care providers were not supportive of HIV-infected couples having more children. For example one man explained:

“We were told ‘many children are not needed now if you already have the disease. Now you must use the condom so that you plan your family so that you don’t have many children.’ They told us that we must use the condom when they had realized that we had the HIV virus.” [Samuel, a 47 year-old father of three]

Continued desire for childbearing

Desire for sons—Cultural factors such as the desire for sons and the ability to carry on the family name were commonly described drivers of childbearing desires among participants who intended to continue childbearing. These factors often outweighed the perceived deterrents to childbearing among these couples and were especially influential among women who had only one or two children, and among men in general in our sample. Several participants, especially men, talked about leaving their legacy behind and reported feeling pressure to have children immediately, before they became too ill. For example, Joseph, a father of three with two wives said:

“I see that we can have a future if we have children, given that we will die later on since both of us are already HIV positive. Yes, our children will go on with our family name even after we have died so that is one of the things that can make me

have the desire to talk with my wife about having children.” [Joseph, a 36 year-old father of three]

Additional childbearing was also an important goal among the majority of participants who had not already borne their preferred number of sons. The need for a son seemed to be more urgently felt among both men and women who were contemplating their early deaths. They often discussed the overwhelming need to have sons who could carry on the lineage and inherit the family land and expressed themes such as:

“As for me, in my heart I wanted to stop giving birth but another part of my heart was telling me that I still don’t have a male child. I recently gave birth to a child who died. Now I am seeing that I should just try and if God accepts, I give birth again and then I can stop.... I feel that I should just give birth to only that one, if God can bless me with that boy.” [Roselida, a 37 year-old mother of four]

Child Replacement—For a few participants, the possibility of a child’s death, due to HIV or other causes, led to the desire to have more children. This seemed to be especially relevant among those who already had children who had died. These participants worried that they would not be able to replace children who died once they themselves became sick due to HIV or AIDS, leaving them with no descendants. The immediate desire to have a lot of children was articulated by numerous men (but very few women) who were worried about the uncertainty of future childbearing. For example, several participants stated that:

“...in this world you cannot be certain because sometimes God, the bad luck of death may fall on you and you remain without any...having many of them is good you can remain with some.” [Zedekia, a 35 year-old father of four]

“Death can rob you of all your children and then you might feel that God should give you others. Yes, because death can come and rob you of all of them, you may feel lonely and decide to get some more.” (Joshua, a 57 year-old father of seven)

Impact of HIV Counselling on Fertility Intentions—Among those who intended to bear more children, they described a confidence in their ability to prevent vertical transmission of HIV. Many women had received their HIV diagnoses during pregnancy and were able to have healthy babies. Several of these participants, both male and female, credited the counselling and services they had received at the HIV clinic on how to prevent perinatal HIV transmission as the main reason why they intended to have more children. While they were not counseled specifically on fertility preferences, this knowledge reassured these couples that they would be able to have another healthy baby in the future despite their HIV infection.

“When I realized that both of us had the HIV virus, I thought that we should not have any more children.... the chances of giving birth to a negative baby were slim. I feared that we may get a child that will add the number of us who are going for medication.... so in that case we shall have put the child’s life at risk. The teachings that we got after knowing that we were positive- I took them very seriously... so I got a lot of knowledge and I was told that a child can be born negative if the parents take good care of themselves. Yes, so that made me start thinking that we should have more children....” [Ochola, a 36 year-old father of three]

“ since I knew that I have the virus I never had the desire to have a child...I was not very excited that I could have a baby, given what I was hearing about the HIV virus. I thought that if I conceived I would give birth to a child who is infected with the virus and therefore die. The more I went for the teachings, the more I changed

my perception about having a baby. When I finally conceived I was happy because I realized that even if I conceive, I can give birth in the hospital and my baby will not have the HIV virus... I got excited that I can have a baby and that the baby will not interfere with the HIV virus..." [Nancy, a 24 year-old mother of one]

However, it was clear that this same counselling and information was not provided to women who were not pregnant and this lack of awareness about the prevention of vertical HIV transmission clearly weighed heavily on their minds when considering more children.

Pressure from Partners—While both men and women often held very similar concerns about how HIV could negatively impact their futures, which generally led to reduced childbearing desires, some important differences emerged. We found that in most couples, men tended to want larger families than women. Many women reported feeling pressured to have more children, regardless of their individual desires, especially if they had less than three living children. Women's perceived obligation to bear an ideal number of children seemed to over-ride their own fears and concerns about continued childbearing despite being HIV-infected.

While most of the women stated that their fertility decisions were made jointly with their husbands, a few women reported that their childbearing decisions were made solely by their husbands. Disagreement about fertility decisions created considerable anxiety for several women who described feeling obligated to comply with the wishes of their husbands whether or not they personally agreed with them. When differences arose in partners' fertility intentions, women described that men's preferences often carried the most weight. However, several women did report covert contraceptive use in order to avoid births despite their husbands' perceived or stated preferences to continue childbearing. This was particularly prevalent among the women who were HIV-infected. We found that the majority of women felt they had to reconcile their fears of giving birth to HIV-infected children or leaving behind orphans with the potential stigmatization within their households and communities for not bearing any or enough children. The fear of being abandoned by their husbands and the fear of a loss of financial support impacted on women's ability to adhere to their fertility desires of having fewer children. For example:

"I am thinking that the three children I have are enough... If he [my husband] wants then I can just add because I cannot deny him. He is the one who is taking care of me." [Anna, a 28 year-old mother of three]

"In the future, I personally would not like to [have more children] but my husband would like to.... he wants other children but in my mind I should have stopped giving birth. He is the one who still wants a baby. He wants a baby and I don't want [one]. The fact that I can give birth is good for him." [Siporah, a 25 year-old mother of two]

In Nyanza province, polygamy continues to be a common practice; over 40 percent of couples in our study reported being in polygamous marriages. Polygamy may contribute to the pressure on women to have more children due to competition among co-wives. In particular, several women who were not in polygamous marriages articulated their fears that their husbands would take on additional wives if they did not comply with their wishes and produce the desired number of children, especially sons. Therefore, polygamy may have further endorsed the social expectations around women's reproductive roles in this community, directly influencing some women's fertility desires.

Discussion

This study is one of the first to examine the impact of HIV on fertility preferences among HIV-infected male and female partners of sero-concordant married couples. In addition, little research exists that demonstrates how HIV infection promotes a desire for more children for some individuals and/or couples. We found that fertility intentions in our sample were driven by individual and couple-level preferences, as well as societal, religious and cultural expectations. When fertility preferences conflicted within the couple, women perceived that the husband's preferences carried the most weight. HIV influenced fertility decisions in several ways, both promoting childbearing in some couples but reducing the desire and intention to have children in most others.

Our results underscored that an HIV diagnosis significantly impacted fertility decision-making among men and women in our study. While some of the considerations involved in decisions to stop childbearing in this sample have been previously reported among African men and women in general, such as relationship concerns and financial constraints (Kodzi et al. 2012), we found that these concerns were often heightened among HIV-infected individuals. In addition, they had many other concerns contributing to the intention to stop childbearing, such as fears of decreasing health status, fear of leaving children orphaned, and fear of vertical transmission. Our results demonstrate that for many participants in our study, cultural factors, especially gender role expectations, were also significant influences on fertility intentions.

HIV compelled all participants to seriously contemplate their futures, including their fertility plans, and participants discussed how they had arrived at their current fertility intentions. Both women and men described conflicting pressures to adhere to their socially expected gender roles while contemplating their fears of the negative consequences to their health and welfare (and that of their children) if they continued childbearing. Many participants reported that in the past they had not used contraception and instead relied on God to decide how many children they had. However, after learning of their HIV status, most participants reported taking a more proactive role in reproductive decision-making. Among both men and women in our sample, the desire for large families was now contrasted with fears of early death, financial limitations, health worries and relationship concerns brought on by HIV. The possibility of transmitting HIV to their children which, coupled with fears of their own death and burdening their families with orphaned children, contributed to decisions to stop childbearing for many, but not all, participants. In addition, stigma and discrimination associated childbearing among HIV-infected couples also deterred some couples from childbearing.

Our findings also revealed that HIV-infected women who had given birth to a baby who was not HIV-infected influenced fertility intentions in contrasting ways. Some women felt that they had been lucky and didn't want to test "fate" or "God's will" to protect a child from HIV infection in the future. However, those who had received some HIV prevention counselling were much more likely to want more children because they felt confident in their ability to have healthy newborns. Participants who had not received this counselling had many misconceptions regarding vertical transmission. Many participants reported that their health care providers had simply given them condoms and told them not to have more children, without exploring their fertility goals. The strong evidence that ART can prevent vertical HIV transmission, as well as premature death and poor health is clearly not being communicated effectively, so many couples and community members continue to overestimate the risks of childbearing among HIV-infected women. Our findings demonstrate the importance of incorporating discussions about fertility intentions into HIV prevention and family planning counselling.

The literature reports that stigma and discrimination associated with HIV and childbearing continue to be widespread in many sub-Saharan African societies (Myer et al. 2006; Turan et al. 2008; Laher et al. 2009; Kaida et al. 2011; Turan et al. 2011; MacCarthy et al. 2012). While stigma was not a central focus of our study, we found similar findings. In previous studies, it has similarly been noted that many HIV-infected women report reluctance to discuss reproductive desires and intentions with a health care provider because of perceived or actual judgmental attitudes, disapproval, and discrimination (Feldman and Maposhere 2003; Cooper et al. 2007; Harries et al. 2007; Maier et al. 2009; Cooper et al. 2009; Kaida et al. 2011; MacCarthy et al. 2012). Our findings concur and we suggest that additional health information and counselling for health care providers are critically needed in this and similar communities given the crucial role that providers play in relaying accurate health information.

While most participants reported that they now intended to have fewer children than they had originally hoped for, 10 men and 7 women reported the desire for more children. Cultural factors, namely gender-role expectations and the desire for sons were the primary drivers of childbearing in this sample. Similar to what has been found in the existing literature; both men and women's fertility desires for large families were largely influenced by cultural norms and societal obligations. For these participants, the desire to meet these obligations did not seem to change despite HIV infection. In response to the need for children to continue the lineage and inherit family property, men felt pressured to have large families. Some studies carried out elsewhere in some sub-Saharan African countries have also noted that men are more likely than women to desire children after HIV diagnosis, which may be due to gender-related desires to leave something of themselves-their 'name' and lineage-behind when they die (Nakayiwa et al. 2006; Myer et al. 2007; Matthews et al. 2013).

In many sub-Saharan African societies, a woman's identity is also defined by her ability to reproduce and pressures to bear children may be particularly strong (Dyer et al. 2002; Laher et al. 2009; Matthews et al. 2013). Our findings are consistent with other studies among HIV-negative women in sub-Saharan Africa; we found that childbearing intentions of HIV-infected women are driven by larger societal and cultural expectations of women's roles as mothers, despite their concerns about their health and futures. The literature has shown that women's desires to stop childbearing are often strongly outweighed by partner and family expectations and that married women in sub-Saharan Africa, regardless of their HIV status, may not be able to exercise their own wishes to stop childbearing (Gruskin et al. 2008; Nduna and Farlane, 2009; Yeatman 2009). We found that the threat of infidelity or abandonment from their husbands if women did not produce enough children raised serious concerns about their future marital stability. In several cases, husbands' preferences took precedence over women's fertility preferences and HIV-infection exacerbated women's economic dependencies because they were even more reliant on their husbands to care for them in the future, financially and otherwise.

Some studies have shown that high infant mortality is a driving factor in the decision to continue childbearing in Zambia, South Africa and Kenya (Cooper et al. 2009; Magadi et al. 2010), while other studies show that child mortality deters couples from further childbearing (Cooper et al. 2007). In our sample, the possibility of child death was a deterrent to childbearing among most couples. However, among a minority, the possibility of child death was a stimulus for childbearing who wanted to replace children that had died or were expected to die. Our finding that many participants, especially men, were reluctant to continue childbearing because of their fears of leaving orphans behind for family members to care for was similar to findings from a study in Malawi among HIV-infected men (Yeatman 2009).

Limitations

This study has several limitations. First, this study examined childbearing intentions in-depth among a relatively small sample of HIV-infected, sero-concordant couples in one province, Nyanza province, in western, rural Kenya. Our findings may not be generalisable to other parts of Kenya or sub-Saharan Africa, urban areas of Kenya, or HIV-discordant couples. However, Morse (1994) suggests an N of 30 in order to achieve adequate saturation and redundancy in qualitative methods and as such, we are confident that our sample size of 46 (23 couples) allowed us to achieve adequate depth and coverage across a range of relevant characteristics (e.g. gender). Second, more than half of our sample was recruited from patients attending a clinic associated with FACES and were not chosen randomly. These participants may have been different from other HIV-infected individuals in the surrounding communities, and they may have been more knowledgeable about the prevention of perinatal transmission, more accepting and open about their HIV-infected status and/or may have felt less stigmatized than other community members who had not received services at the clinics. In addition, having access to ART may have influenced their fertility intentions, especially promoting continued childbearing by alleviating some of the common fears among HIV-infected couples. Our findings among the clinic-based couples are therefore not likely to be generalizable to populations without access to ART. In order to participate, both male and female partners had to agree to participate. This might have biased the sample in favour of couples who have more egalitarian relationships. Furthermore, in Nyanza province, polygamy continues to be a common practice; over 40 percent of couples in our study reported being in polygamous marriages. This may have had a significant impact on childbearing intentions, independent of HIV diagnosis and thus our findings are not generalizable outside of polygamous marriages. Finally, as participants were responding to questions regarding future intentions, it is difficult to know whether their responses are predictive of actual reproductive behavior in the future.

Conclusions

HIV sero-concordant couples have varying desires regarding future child-bearing. In this study we found that couples were lacking accurate and complete information about preventing perinatal HIV transmission during pregnancy and about preventing pregnancy if conception was not desired. Efforts to increase widespread access to and create awareness and remove misconceptions about strategies to prevent perinatal HIV transmission and to prevent pregnancy are urgently needed. Healthcare counselling and service interventions must take into account sero-concordant HIV-infected couples' (as well as sero-discordant) diverse reproductive goals in order to provide a supportive environment for all couples to facilitate discussion about their reproductive options. Ensuring that effective, nonjudgmental family planning services are strengthened, available and integrated into HIV treatment services is required in order to optimise healthy outcomes for mothers, fathers, and children. In addition, ensuring a continuum of care that begins with the HIV diagnosis and that meets the varying needs of HIV-infected couples is especially important. Couple-oriented programming needs further attention in order to better address the gender-related differences in childbearing intentions that are experienced by HIV-infected couples, potentially increasing communication around fertility decisions within couples. Making assisted reproductive technologies available to HIV-infected couples who plan to continue childbearing is also critical. Finally, this study highlights the need to de-stigmatize issues around HIV and childbearing, both in the general community and among healthcare providers. Community-level programmes could help dispel myths that most HIV-infected women will give birth to HIV-infected babies, and reduce widespread stigma about HIV transmission and childbirth so that HIV-infected couples feel comfortable in sharing their fertility intentions with providers and others in their communities.

Acknowledgments

We thank the Kenyan men and women who participated in the study. We acknowledge the important logistical support of the KEMRI-UCSF Collaborative Group and especially Family AIDS Care and Education Services (FACES). We gratefully acknowledge the Director of the Kenya Medical Research Institute (KEMRI), the Director of KEMRI's Centre for Microbiology, and the Nyanza Provincial Ministries of Health for their support in conducting this research. We also wish to thank the study coordinator- Zachary Kwena- and the interviewers - Salome Ogola Amuom, Alphonse Omondi Awiti and Stephen Omondi Ajuoga-for their vital contribution to this study. We further acknowledge Nelly Oluoch, Edinah Okundi and Lilian Achiro for their assistance with transcription and translation of the data. Finally, we wish to thank the support of our funders. This research was supported by the Hellman Family Foundation and a grant from the National Institutes of Health, University of California San Francisco-Gladstone Institute of Virology & Immunology Center for AIDS Research, P30 AI27763 and the University of California, Berkeley Fogarty International AIDS Training Program (AITRP).

References

- Cooper D, Harries J, Myer L, Orner P, Bracken H. 'Life is still going on': reproductive intentions among HIV-positive women and men in South Africa. *Social Science & Medicine*. 2007; 65:274–283. [PubMed: 17451852]
- Cooper D, Moodley J, Zweigenthal V, Bekker LG, Shah I, Myer L. Fertility intentions and reproductive health care needs of People Living With HIV in Cape Town, South Africa: implications for integrating reproductive health and HIV care services. *AIDS and Behavior*. 2009; 13:S38–S46.
- Dyer SJ, Abrahams N, Hoffman M, van der Spuy ZM. 'Men leave me as I cannot have children': Women's experiences with involuntary childlessness. *Human Reproduction*. 2002; 17(6):1663–1668. [PubMed: 12042295]
- Feldman R, Maposhere C. Safer sex and reproductive choice: findings from positive women: voices and choices in Zimbabwe. *Reproductive Health Matters*. 2003; 11:162–173. [PubMed: 14708407]
- Gruskin S, Firestone R, MacCarthy S, Ferguson L. HIV and pregnancy intentions: do services adequately respond to women's needs? *American Journal of Public Health*. 2008; 98(10):1746–1750. [PubMed: 18703432]
- Harries J, Cooper D, Myer L, Bracken H, Zweigenthal V, Orner P. Policy maker and health care provider perspectives on reproductive decision-making amongst HIV-infected individuals in South Africa. *BMC Public Health*. 2007; 7:282. [PubMed: 17919335]
- Hoffman IF, Martinson FE, Powers KA, Chilongozi DA, Msiska ED, Kachipapa EI, Mphande CD, Hosseinipour MC, Chanza HC, Stephenson R, Tsui AO. The year-long effect of HIV-positive test results on pregnancy intentions, contraceptive use, and pregnancy incidence among Malawian women. *Journal of Acquired Immune Deficiency Syndrome*. 2008; 47(4):477–483.
- Kaida A, Laher F, Strathdee SA, Janseen PA, Money D, Hogg RS, Gray G. Childbearing intentions of HIV-positive women of reproductive age in Soweto, South Africa: the influence of expanding access to HAART in an HIV hyperendemic setting. *American Journal of Public Health*. 2011; 101(2):350–358. [PubMed: 20403884]
- Kodzi IA, Johnson DR, Casterline JB. To have or not to have another child: Life cycle, health and cost considerations of Ghanaian women. *Social Science & Medicine*. 2012; 74:966–972. [PubMed: 22361092]
- Laher F, Todd CS, Stibich MA, Phofa R, Behane X, Mohapi L, Gray G. A qualitative assessment of decisions affecting contraceptive utilization and fertility intentions among HIV-positive women in Soweto, South Africa. *AIDS and Behavior*. 2009; 13:S47–S54.
- Lewis-Kulzer JA, Marima R, Penner JA, Oyaro P, Oyanga A, Shade SB, Blat CC, Nyabiage L, Mwachari C, Muttai H, Bukusi EA, Cohen CR. Family model of HIV care and treatment - building on family strengths. *Journal International AIDS Society*. 2012; 22(1):8. 15.
- Lofland, J.; Lofland, JH. *Analyzing social settings: A guide to qualitative observation and analysis*. Detroit, MI: Wadsworth; 1995.
- London L, Orner P, Myer L. Even if you're positive, you still have rights because you are a person': Human rights and the reproductive choice of HIV-positive persons. *Developing World Bioethics*. 2007; 8(1):11–22. [PubMed: 18302539]

- MacCarthy S, Rasanathan JJK, Ferguson L, Gruskin S. The pregnancy decisions of HIV-positive women: the state of knowledge and way forward. *Reproductive Health Matters*. 2012; 20(39S): 119–140. [PubMed: 23177686]
- Magadi MA, Agwanda AO. Investigating the association between HIV/AIDS and recent fertility patterns in Kenya. *Social Science & Medicine*. 2010; 70:335–344. [PubMed: 20494502]
- Maier M, Andia I, Emenyonu NM, Guzman D, Kaida A, Pepper L, Hogg R, Bangsberg DR. Antiretroviral Therapy is Associated with Increased Fertility Desire, but not Pregnancy or Live Birth, among HIV+ Women in an Early HIV Treatment Program in Rural Uganda. *AIDS and Behavior*. 2009; 13:S28–S37.
- Matthews LT, Crankshaw T, Giddy J, Kaida A, Smit JA, Ware NC, Bangsberg DR. Reproductive Decision-Making and Periconception Practices Among HIV-Positive Men and Women Attending HIV Services in Durban, South Africa. *AIDS Behavior*. 2013; 17:461–470. [PubMed: 22038045]
- Measure, DHS. [Accessed March 1 2013] Kenya Demographic and Health Survey 2008–09. 2009. <http://www.measuredhs.com/publications/publication-FR229-DHS-Final-Reports.cfm>
- Mmbaga EJ, Ezekiel MJ, Kakoko DC. Fertility desire and intention of people living with HIV/AIDS in Tanzania: a call for restructuring care and treatment services. *BMC Public Health*. 2013; 13:86. [PubMed: 23360397]
- Morse, JM. Designing funded qualitative research. In: Denzin, NK.; Lincoln, YS., editors. *Handbook of qualitative research*. Thousand Oaks, CA: Sage; 1994. p. 220-235.
- Myer L, Morroni C, Cooper D. Community attitudes towards sexual activity and childbearing by HIV-positive people in South Africa. *AIDS Care*. 2006; 18(7):772–776. [PubMed: 16971287]
- Myer L, Morroni C, Rebe K. Prevalence and determinants of fertility intentions of HIV-infected women and men receiving antiretroviral therapy in South Africa. *AIDS Patient Care and STDs*. 2007; 21(4):278–285. [PubMed: 17461723]
- Nakayiwa S, Abang B, Packer L, Lifshay J, Purcell DW, King R, Ezati E, Mermin J, Coutinho A, Bunnell R. Desire for children and pregnancy risk behavior among HIV-infected men and women in Uganda. *AIDS and Behavior*. 2006; 10(Supplement 1):S95–S104. R. [PubMed: 16715343]
- Nattabi B, Li J, Thompson SC, Orach CG, Earnest J. A systematic review of factors influencing fertility desires and intentions among people living with HIV/AIDS: implications for policy and service delivery. *AIDS and Behavior*. 2009; 13:949–968. , J. [PubMed: 19330443]
- Newmann SJ, Mishra K, Bukusi EA, Cohen CR, Gage O, Onono M, Odeny R, Schwartz KD, Grossman D. Integration of Family Planning into HIV Care in Nyanza Province, Kenya: What do Providers Think? *AIDS Research and Treatment*. 2013 e-published ahead of print.
- Nduna M, Farlane L. Women living with HIV in South Africa and their concerns about fertility. *AIDS and Behavior*. 2009; 13:S72–S65.
- Rutenberg N, Biddlecom AE, Kaona FAD. Reproductive decision-making in the context of HIV and AIDS: A qualitative study in Ndola, Zambia. *International Family Planning Perspectives*. 2000; 26(3):124–130.
- Strauss, A.; Corbin, J. Denzin, NK.; Lincoln, YS. *Handbook of qualitative research*. Thousand Oaks, CA: Sage; 1994. Grounded theory methodology; p. 273-285.
- Turan JM, Bukusi EA, Onono M, Holzemer WL, Miller S, Cohen CR. HIV/AIDS stigma and refusal of HIV testing among pregnant women in rural Kenya: results from the MAMAS Study. *AIDS and Behavior*. 2011; 15(6):1111–1120. [PubMed: 20827573]
- Turan JM, Miller S, Bukusi EA, Sande J, Cohen CR. HIV/AIDS and maternity care in Kenya: how fears of stigma and discrimination affect uptake and provision of labor and delivery services. *AIDS Care*. 2008; 20(8):938–945. [PubMed: 18777222]
- United Nations AIDS. Report on the Global HIV/AIDS Epidemic. Geneva, Switzerland: Joint United Nations Programme on HIV/AIDS; 2012. http://www.unaids.org/en/media/unaids/contentassets/documents/epidemiology/2012/gr2012/20121120_UNAIDS_Global_Report_2012_with_annexes_en.pdf [Accessed March 1 2013]
- Yeatman SE. The impact of HIV status and perceived status on fertility desires in rural Malawi. *AIDS and Behavior*. 2009; 13(Suppl. 1):12–19. [PubMed: 19301116]

Table 1

Demographic characteristics of study sample: 23 HIV+, sero-concordant, married couples

	Men N=23 (50%)	Women N=23 (50%)
Mean age , years (range)	42 (23–63)	32 (20–42)
Education *		
Less than primary school	13 (59%)	13 (59%)
Completed primary school	2 (9%)	5 (23%)
Above primary school	7 (32%)	4 (18%)
Number of live children , (range)	5.7 (2–14)	3.7 (1–6)
Mean length of marriage , years (range)	10 (1–20)	10 (1–20)
Polygamous marriage	16 (47%)	15 (42%)
Desire for more children *		
No	12 (54%)	15 (68%)
Yes, now	3 (14%)	1 (5%)
Yes, future	7 (32%)	6 (27%)

Notes:

* data not complete for all participants