Title: Increasing desire for permanent family planning methods among women in a high HIV-prevalence rural setting in Uganda

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Abstract

Background: High fertility and unmet need for family planning (FP) are health challenges among women in Uganda. We assessed the desire for childbearing, use of modern FP and desire for tubal ligation among women in rural Rakai District, SW Uganda.

Methods: Longitudinal analysis of non-pregnant sexually active women aged 15-49 yrs, enrolled in an open community cohort between 2002 (N= 3864) and 2008 (N=4354). Women were asked whether they wanted to have a/another child and if not, whether they were willing to accept a permanent method of family planning if it was made available.

Results: Overall, women's desire for childbearing increased from 54.7% in 2002 to 57.8% in 2008 ($p<0.01$). Women's desire to limit childbearing increased with age and parity. Use of modern FP significantly increased from 38.4% to 46% ($p<0.0001$). Among women who did not want to bear a/another child (limiters), there was increased use of short acting FP methods ($p<0.0001$) while long acting method use significantly declined ($p<0.001$). High proportions of limiters expressed a willingness to adopt a permanent FP method (from 53% in 2002 to 62% in 2008; $p<0.0001$), with consistently higher and increasing proportions among HIV positives (62% to 71 %) compared to HIV negatives (53% to 60%). The desire for a permanent FP method also increased with increasing parity.
Conclusions: There is a latent demand for tubal ligation and a need to increase services for permanent FP methods for women who want to limit child bearing.

Abstract 241 words

Introduction

Freely deciding the number and timing of children is a basic human right with implications for maternal and child health, the wellbeing of families and prevention of mother to child HIV transmission (MTCT). With a population growth rate of 2.5% py, Sub Saharan Africa (SSA) has the highest population growth in the world[1]. Such high rates of population growth often co-exist with a substantial unmet need for family planning (FP) which is estimated to be 25% among married women in SSA[2]. Couples who intend to space or limit births could benefit from access to more contraceptive choices, including long acting methods (IUD, implants) and permanent methods (female sterilization and vasectomy) which are both convenient and effectively protect against pregnancy. Currently, most women using modern contraception in Uganda are using short acting methods such as oral contraceptives and injectables. Short term acting methods are highly effective, but incorrect and inconsistent use is common, leading to accidental pregnancies[21]. Long acting methods and sterilization are less vulnerable to user error and thus are much more effective [3]. Also, some studies suggest that women using progestogen-only injectable contraception may be at increased risk of HIV acquisition, [16-20] but there are few medical contraindications to sterilization which provides an option for women with HIV who want to prevent unwanted pregnancies and mother to child HIV transmission. Despite these advantages, use of sterilization remains relatively infrequent, because of limited access and other barriers.

Uganda, with a mid 2010 population of 33.8m of which 6-7 million are women of reproductive age (15-49 years), has an annual growth rate of approximately 3.4%[2]. The total fertility rate (TFR) remains high at 6.2 children per woman in 2010[4], and there are estimated to be about 755 000 unplanned pregnancies. Uganda has the third fastest rate of population growth in the world[5]. The recent Uganda Demographic and Health Survey (UDHS) reported that only 26% of married women report current use of modern FP methods, and 34.3% have an unmet need for FP,[4] with 21% having an unmet need for spacing births and 14% for limiting childbearing. Uganda's average TFR has declined from 7.3 children in 1989[9] to 6.9 in 1995[10] and 2001[11] to 6.7 in 2006[12] and 6.2 in 2010[4]. However, the levels of unmet need remain high as the ideal number of children reported by Ugandan women is about 5.1.

Female and male sterilization are underutilized in Uganda. [5-7]. Female sterilization increased from 2% in 2000 to 3.0% in 2010[4], and 86% of women were aged 39 or younger at the time of sterilization. However, a survey of new FP clients suggests an increased desire to limit births[8].
Most family planning promotional messages in Uganda stress spacing rather than limiting childbearing[5] and there is a need to assess the underlying demand for sterilization which might motivate the government and FP programs to increase both long acting and permanent services.

We investigated the desire for childbearing, use of modern contraception and the desire for permanent FP methods among sexually active non pregnant women of reproductive age enrolled in a cohort in Rakai District southwestern Uganda.

Methods

Since 1994 the Rakai Health Sciences Program has conducted an open community-based cohort, the Rakai Community Cohort Study (RCCS), which enrolls consenting residents aged 15-49 years in 50 communities in Rakai District, Uganda. The RCCS population is demographically and behaviorally representative of rural southwestern Uganda. Each RCCS participant receives a unique, life-long identification number used to link data over time. RCCS written informed consent covers study participation, sample collection and testing.
The annual RCCS survey, conducted after a census, includes all consenting residents (n ~12,000 per year). Experienced same-sex interviewers, fluent in Luganda, the local language, have been trained to ensure participant privacy and confidentiality and use structured questionnaires to collect detailed socio-demographic characteristics, risk behaviors, contraceptive use, health and care seeking information. Blood and other samples

are collected for assays including HIV (EIA, with WB and/or PCR confirmation). The design and conduct of the RCCS have been described elsewhere.[14,15]
The RCCS and its procedures were approved by the Uganda Virus Research Institute IRB (the Science and Ethics Committee), the National Council for Science and Technology (Uganda) and the Institutional Review Boards for Johns Hopkins and Columbia Universities.
Using four surveys between 2002 and 2008 (survey rounds 9 to12, 2002/03, 2003/04, 2005/06 and 2006/08, respectively), we examined time trends and factors associated with desire for child bearing, contraceptive prevalence and demand for a permanent method of FP among non-pregnant, fecund and sexually active women of childbearing age (15-49 yrs).

Statistical Analysis

For this analysis we included women of child bearing age (15-49 years) who were not pregnant (based on self reports, observation and hCG test), and were sexually active in the 12 months preceding the interview. Women who reported no intention to have a/another child/children were defined as having a desire to limit childbearing (limiters), and were asked whether they would be willing to have a permanent FP method if the service was provided. Modern family planning methods included current use of oral contraceptives, injectables, condoms, spermicides, intrauterine devices, implants, and tubal ligation. We categorized modern FP methods as short acting (oral contraceptives, injectables, condoms), long-acting (IUD, Norplant) and permanent methods (tubal ligation). Associations were assessed using Chi square tests and Chi square test for trends in proportions. We used modified Poisson regression models to estimate prevalence rate ratios (PRR) and 95% confidence intervals (95% CI) with robust variance to allow for correlation of repeated responses from individuals across survey rounds. Statistical analyses used STATA software version 12 (College Station, Texas, USA)[13].

Results

A total of 7,753 women with single or multiple data points were included in this analysis.

Table 1 shows the distribution of selected socio-demographic and behavioral characteristics of the women at the first and last survey rounds included in the analysis. There were significant increases in age and educational status and an increase in the proportion of women with no children and those who were HIV positive. All the other characteristics (residence, marital status) had similar distributions.

Table 2 shows overall modern contraceptive prevalence (short acting methods, and combined long-acting and permanent methods). It also shows contraceptive prevalence amongst limiters, among limiters with a desire for a permanent method and among HIV positive and HIV negative limiters at each survey round. Among all women, there was a significant increase over time in the use of short acting modern FP methods (36% to 45%, χ^2 for trend=54.36: $p<0.0001$). However, there was a statistically significant decrease in the use of long acting/permanent methods over the survey period (2.3% to 1.3%, χ^2 for trend=12.93: $p<0.001$). The use of a permanent method was consistently below 1% over the study period (data not shown).

Among women who wished to limit childbearing, there was a significant increase in the use of short acting FP methods (38% to 49.5%; $p<0.0001$), but a significant decline in the use of long acting/permanent methods (3.3% to 1.6%; $p<0.001$). The significant increase in use of short term and decrease in use of long acting FP methods were observed among both HIV-negative and HIV-positive limiters (Table 2). Long acting/permanent method use dropped from 3.9% to 1.6% among HIV +ve limiters while this dropped from 3.7% to 1.7% among HIV –ve limiters.

Table 3 shows the proportions willing to have tubal ligation among sexually active women who did not desire a/another child. Among women who wanted to limit childbearing there was a significant increase in the proportions who said they were willing to have a permanent FP method, from 53% to 62% ($p<0.0001$). This

increase was observed among both HIV-positive and HIV-negative limiters. The proportion stating they were willing to have tubal ligation was consistently higher among the HIV-positive (62%-71%) compared to HIV-negative (53%-60%) limiters at all survey rounds. Willingness to adopt a permanent family planning method increased with parity (data not shown).

Women's desire for a/another child over the four surveys increased from 54.7% to 57.8% ($p<0.01$; data not shown). However, the proportions of HIV-positive women desiring a/another child remained relatively stable across survey rounds (~37%). Also, the desire to limit childbearing was higher among the HIV-infected women than uninfected in all time periods. Women's desire to limit childbearing increased with age and parity (data not shown).

Table 4 summarises the results from the modified Poisson regression analyses. Factors inversely associated with a desire for childbearing included older age, higher parity, living in an urban community, being single or previously married (divorced/separated/widowed) and being HIV positive. Factors significantly associated with a desire for a permanent FP method included being in the 45-49 year age group, higher parity, and being HIV positive. Saved/pentecostal and Muslim women were significantly less likely to express a preference for tubal ligation compared to Catholic women. Women who were previously married were also less likely to express a preference to adopt tubal ligation compared to married women.

Discussion

Uptake of modern short acting FP is increasing while long acting and permanent FP method use is low and decreasing in this population. Short acting methods include male condoms whose use among HIV positive limiters increased from 24.1% to 51% forming the biggest proportion among these methods. Much as condom use is protective against HIV transmission and unwanted pregnancies, it is not often consistently used and adopting a female controlled method for dual protection would be beneficial. It has been shown that preference for a permanent method increased among limiters in this rural resource constrained setting. The findings from our analyses might be an indicator of future trends in Uganda. Limiting births has a greater impact on fertility rates than spacing births and is a major factor driving the fertility transition.

The proportion willing to be sterilized was higher among HIV-infected than uninfected women at all survey rounds. In Uganda female sterilization is only used by <3% of currently married women[4]. Our analyses however indicate high levels of potential demand for sterilization among limiters.

In Malawi, despite severe resource constraints, female sterilization was widely and equitably provided, and is now the second most commonly used modern FP method[22]. Sterilization is not vulnerable to user error and thus highly effective[23] but use of sterilization remains infrequent because of limited availability in sub-Saharan Africa[5]. Female sterilization increased from 2 percent in 2000 to 3.0 percent in 2010 in Uganda, and 86 percent of women were aged 39 or younger at the time of sterilization[4]. There would be net benefits to women and society by averting unintended pregnancies with increased investment in sterilization services[24]. This is especially important for HIV-infected women, to prevent unwanted pregnancy and mother-to-child HIV transmission. However, for permanent methods to be promoted in Uganda there is a need to increase the number of facilities that provide these services with properly trained and motivated personnel.

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Table 1: Percentage of women included in the analysis by selected sociodemographic and behavioral characteristics at rounds 9 and 12.

Characteristic	Round 9 (2002/03)	Round 12 (2006/08)	p-value
N	**3864**	**4354**	
Residence			
Rural	81.8	80.5	
Urban	18.2	19.5	0.131
Age Years			
15-19	8.3	4.8	
20-24	26.0	19.7	
25-29	25.3	25.6	
30-34	16.7	22.1	
35-39	10.8	12.8	
40-44	8.1	8.9	
45-49	4.8	6.1	<0.001
Marital Status			
Married	77.6	77.8	
Never Married	11.3	10.7	
Divorced/Sep/Widowed	11.1	11.5	0.486
Education			
No education	8.4	7.1	
Some primary	64.9	62.0	
Post Primary	26.7	30.9	<0.001
Number of living children			
None	7.8	9.7	
1-2	30.1	27.3	
3-5	40.8	40.8	
6+	21.3	22.3	<0.01
HIV Status			
Positive	10.5	13.6	
Negative	68.2=7	84.2	
Unknown	21.4	2.2	<0.001

Table 2: Contraceptive use overall, among limiters, among limiters with a desire to adopt a permanent method and among HIV positive and HIV negative limiters desiring a permanent method

Survey round	N	Short acting methods (r%)	Long acting/permanent methods (r%)
Round 9 (2002/03)			
Overall	**3864**	36.1	2.3
Limiters	1749	38.2	3.3
Limiters Desire PM*	758	51.6	4.2
Limiters HIV +ve	257	47.9	3.9
Limiters HIV –ve	1080	38.7	3.7
Round 10 (2003/04)			
Overall	3900	39.2	2.0
Limiters	1756	39.1	2.9
Limiters Desire PM*	797	52.2	4.4
Limiters HIV +ve	257	47.1	2.7
Limiters HIV –ve	1227	40.8	3.3
Round 11 (2005/06)			
Overall	4121	38.9	1.6
Limiters	1846	42.3	2.1
Limiters Desire PM*	897	54.0	2.3
Limiters HIV +ve	295	54.6	0.7
Limiters HIV –ve	1400	40.4	2.4
Round 12 (2006/08)			
Overall	4354	44.6	1.3
Limiters	1837	49.5	1.6
Limiters Desire PM*	975	61.9	2.3
Limiters HIV +ve	367	68.9	1.6
Limiters HIV –ve	1432	45.3	1.7

**Permanent Method*

Table 3: Proportion willing to use a permanent FP method among the non-pregnant sexually active women who want to limit child bearing

	Round 9 (2002-2003)		Round 10 2003-2004		Round 11 2004-2006		Round 12 2006-2008	
Willing to use a permanent method	**N**	**Yes (%)**	**N**	**Yes (%)**	**N**	**Yes (%)**	**N**	**Yes (%)**
All	**1419**	**53.4**	**1447**	**55.1**	**1528**	**58.7**	**1568**	**62.2**
HIV +ve	217	62.2	225	60.0	258	70.9	343	71.1
HIV –ve	900	52.6	1028	55.3	1153	56.8	1195	59.8

Table 4: Adjusted Prevalence Rate Ratios of desire for child bearing and willingness to use a permanent FP method

Outcome	**Desire for a/another child**			**Willing to use a permanent FP method**		
Risk Factors	Adj. PRR	95%CI Lower	Upper	Adj. PRR	95%CI Lower	Upper
Age group						
15-19	1			1		
20-24	**1.02**	**1.00**	**1.04**	1.01	0.66	1.54
25-29	**0.95**	**0.93**	**0.98**	0.97	0.64	1.49
30-34	**0.79**	**0.76**	**0.82**	0.92	0.60	1.41
35-39	**0.51**	**0.47**	**0.54**	0.84	0.55	1.30
40-44	**0.27**	**0.23**	**0.31**	0.67	0.44	1.03
45-49	**0.14**	**0.12**	**0.18**	0.48	0.31	0.74
Education						
None	1			1		
Some Primary	0.99	0.93	1.06	1.04	0.95	1.08
Post Primary	0.99	0.93	1.07	0.95	0.85	1.06
Religion						
Catholic	1			1		
Protestant	0.98	0.95	1.01	1.02	0.96	1.09
Saved/Pentecostal	1.04	0.97	1.11	0.63	0.45	0.89
Muslim	0.98	0.94	1.01	0.88	**0.81**	**0.95**
None/Other	0.92	**0.76**	**1.01**	0.89	0.63	1.25
Parity						
None	1			1		
1-2	**0.84**	**0.81**	**0.86**	1.15	0.82	1.61
3-5	**0.63**	**0.61**	**0.66**	**1.45**	**1.05**	**2.02**
6+	**0.32**	**0.29**	**0.35**	**1.68**	**1.21**	**2.34**
Marital Status						
Currently Married	1			1		
Never Married	**0.89**	**0.86**	**0.92**	0.96	0.85	1.08
Previously Married	0.71	0.67	0.76	0.91	0.85	0.97
Residence						
Rural	1			1		
Urban	0.95	0.92	0.98	1.01	0.95	1.08
HIV Status						
Neg	1			1		
Pos	**0.65**	**0.62**	**0.69**	**1.19**	**1.12**	**1.26**