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Contraceptive discontinuation and switching among couples receiving integrated HIV and family planning services in Lusaka, Zambia

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Abstract

Objective—To describe predictors of contraceptive method discontinuation and switching behaviors among HIV positive couples receiving couples' voluntary HIV counseling and testing services in Lusaka, Zambia.

Design—Couples were randomized in a factorial design to two family planning educational intervention videos, received comprehensive family planning services, and were assessed every 3-months for contraceptive initiation, discontinuation and switching.

Methods—We modeled factors associated with contraceptive method upgrading and downgrading via multivariate Andersen-Gill models.

Results—Most women continued the initial method selected after randomization. The highest rates of discontinuation/switching were observed for injectable contraceptive and intrauterine device users. Time to discontinuing the more effective contraceptive methods or downgrading to oral contraceptives or condoms was associated with the women's younger age, desire for more children within the next year, heavy menstrual bleeding, bleeding between periods, and cystitis/dysuria. Health concerns among women about contraceptive implants and male partners not wanting more children were associated with upgrading from oral contraceptives or condoms. HIV status of the woman or the couple was not predictive of switching or stopping.

Conclusions—We found complicated patterns of contraceptive use. The predictors of contraception switching indicate that interventions targeted to younger couples that address common contraception-related misconceptions could improve effective family planning utilization. We recommend these findings be used to increase the uptake and continuation of contraception, especially long acting reversible contraceptive (LARC) methods, and that fertility-goal based, LARC-focused family planning be offered as an integral part of HIV prevention services.

Keywords

Contraceptive discontinuation; couples' voluntary HIV counseling and testing; family planning; long-acting reversible contraception; Zambia

Introduction

Of the estimated 33 million people living with HIV/AIDS worldwide, 16 million are women of reproductive age [1]. Improving family planning services for HIV positive women is a key public health goal; preventing unintended pregnancy reduces maternal and child mortality, rates of mother-to-child HIV transmission, and poverty, while improving socioeconomic status, access to education, and gender equity [2-4].

Currently, the most common modern methods of contraception used across sub-Saharan Africa, where prevalence of HIV among reproductive age women is highest, are condoms

and hormonal contraceptives (oral contraceptive pills (OCPs) and injectables (INJ), including depo-medroxyprogesterone acetate (DMPA) and norethisterone enanthate (NET-EN)). Estimated 1-year typical-use failure rates are 15% for condoms, 8% for OCPs, and 3% for INJ [5, 6]. Continuation of these short-acting methods can be poor, with studies reporting 12-month continuation of DMPA as low as 23-28% [7, 8]. Further, contraceptive effectiveness requires a consistent and timely re-supply (every three months for DMPA and two months for NET-EN) and, in the case of OCPs, adherence with daily dosing [6].

Alternative long-acting reversible contraceptive (LARC) methods, such as the intrauterine device (IUD) and contraceptive implant (IMP), are less commonly used though notably more effective, with typical-use failure rates of <1% [5, 6]. In contrast to the shorter-acting methods, the copper IUD and IMP have efficacy for 10-12 years and 3-5 years, respectively, without the need for recurrent clinic visits [9, 10].

Countries with high adult prevalence of HIV often have low rates of contraception use, and the fertility desires of HIV positive couples may not be addressed in HIV programs. Promotion of dual-method use, condoms for HIV prevention along with a second more effective contraceptive for added protection against unplanned pregnancy, is a key goal [11-13]. A concerted effort has been directed toward the study of patterns and predictors of contraception use among HIV positive and at-risk women in order to identify practical ways to increase method use, particularly dual-method use with LARC; however this remains an operational challenge [11, 14, 15].

Integration of family planning into existing HIV programing has been encouraged as a step towards prevention of unintended pregnancy and mother-to-child HIV transmission [16]. Since most unintended pregnancies among contraceptive using women occur when individuals discontinue their method or are non-adherent [17], longitudinal data evaluating the impact of family planning interventions offered within the context of HIV services are needed. We sought to describe contraceptive discontinuation and switching patterns among a cohort of women receiving family planning services in an integrated couples' voluntary HIV counseling and testing (CVCT) service model in Lusaka, Zambia. Furthermore, we sought to determine factors associated with contraceptive method discontinuation or switching behaviors, both to more and less effective contraceptive methods. This information will assist in targeting interventions to improve family planning utilization and uptake of highly effective birth control.

Methods

Study design

The study and intervention design, uptake of contraception immediately after the intervention [18], impact of informed consent on knowledge and concerns about contraceptive methods [19], demographics of the cohort, and impact of the intervention on incident pregnancy [20] have been previously reported.

We analyzed data from 1060 HIV concordant positive (N=721) or discordant couples (N=339) recruited from CVCT clinics in Lusaka, Zambia. Eligible couples were cohabiting

at least 12 months, fecund, not currently pregnant, and had no contraception contraindications. Eligible men were 18-65 and women were 18-45 years old. Participants were randomized in a factorial design to view video-based interventions. A “Methods” video detailed family planning methods with a focus on LARC, a “Motivational” video modeled future planning behaviors, and a “Control” video contained information on topics such as hand washing, bed-nets, and nutrition. After the intervention, couples were offered the full range of contraceptive methods on-site and were followed at 3-month intervals, with the possibility for interim visits. At each visit, we surveyed health and contraceptive-related events occurring during the past 3 months. Participants had access to the full range of contraceptive methods throughout the study in the event they desired to switch methods. Couples in which the man reported wanting more children within the next year at baseline were excluded in this analysis.

The Institutional Review Boards at Emory University and the University of Zambia approved the study, and written informed consent was obtained from all study participants.

Analysis

Based on our prior evaluation of this cohort, we classified condoms and OCPs as the least effective methods, as pregnancy incidence was 26.42 and 20.67 per 100 PY for these methods, respectively. Pregnancy incidence for DMPA, IUD and INJ users were similar at 0.74, 1.55 and 0 per 100 PY [21]. Rates of pregnancy were similar for INJ and LARC method users in our cohort. As the literature supports that LARC methods are more effective given the user-independency, we classified INJ as having intermediate effectiveness and LARCs as having the highest effectiveness in this evaluation. Contraceptive discontinuation and switching patterns during follow-up were explored after initial method selection following the intervention video. These choices included continuing the method chosen after the intervention, upgrading to a more effective method (e.g., switching from OCPs or condoms only to INJ or LARC), switching laterally between LARC methods (e.g., switching between IUD and IMP), downgrading to a less effective method (e.g., switching from LARC or INJ to OCP or condoms only). Condoms were provided to all couples at each visit irrespective of HIV status or contraceptive method selected.

Self-reported reasons for switching methods were evaluated by the type of change (upgrading, moving laterally, or downgrading/stopping). Method-specific rates of discontinuation and 95% CIs were calculated as the number of discontinuations occurring during follow-up divided by the total follow-up time on each method. Significant differences between discontinuation rates for each method versus OCPs were assessed with Mid-p exact tests.

We built two multivariate models to explore two different recurrent outcomes of interest. Our first outcome was time to stopping the more effective methods (INJ/IUD/IMP) or downgrading to OCP or condoms only. We combined INJ and LARC method users in this analysis as these groups had similar low pregnancy rates [21]. The reference group included couples that continued more effective methods (INJ/IUD/IMP) or upgraded from INJ to IUD/IMP or tubal ligation (BTL).

Our second outcome was time to upgrading from less effective methods (OCPs, condoms only) to more effective methods (INJ/IUD/IMP or BTL). The reference group included couples who continued less effective methods (OCP, condoms only) or who switched from OCPs to condoms only.

Exposures of interest for each model included fixed variables (trial arm, socio-demographics, fertility goals, family planning and behavioral factors, and HIV-related health characteristics) as well as time-varying health and sexual behavioral characteristics assessed at 3-monthly and interim visits. Women were censored at pregnancy or loss to follow-up.

Andersen-Gill models using a counting process approach with robust estimation to account for recurrent outcomes and for correlated observations [22] were used to determine the factors associated with each outcome. Multivariate models were built using exposures that were significant in the univariate ($p < 0.05$), and model variables were assessed for multicollinearity (condition indices > 30 and variance decomposition proportions > 0.5). The proportional hazards assumption was confirmed for time-independent model variables using graphical methods and statistical tests. Crude hazards ratios (cHRs) and adjusted hazards ratios (aHRs) are presented for univariate and multivariate associations, respectively. Data analysis was conducted with SAS v9.3 (Cary, NC).

Results

Patterns of contraceptive use

Figure 1 shows a flow diagram of contraceptive method use patterns for the 1060 participants during study follow-up as well as planned and unintended pregnancies. After viewing the intervention video(s), 465 participants chose INJ (44%), 379 chose OCP (36%), 146 chose IMP (14%), 41 chose IUD (4%), 17 chose condoms only (2%), and 12 chose tubal ligation (1%).

Women were followed for a mean of 506.6 days ($SD = 318.6$). Almost three-quarters of women ($N = 785$) continued the method they chose after randomization until the end of the study, while roughly one-quarter ($N = 254$) switched or discontinued their current method at least once. During the study, 21 women stopped their method because they desired pregnancy (Figure 1). Women selecting IUD as their first method had significantly ($p < 0.05$) longer follow-up (720.2 days, $SD = 350.2$) than the average 506 days.

Of the 373 initial OCP users not expressing a desire to conceive, 16% switched to another method or stopped. Of these, 64% upgraded and 36% downgraded to condoms only. Of the 452 initial INJ users not reporting the desire to become pregnant, 34% switched to another method or stopped. Of these, only 5% upgraded to a more effective method and 95% downgraded to OCP or condoms only. Of the 145 initial IMP users who did not desire pregnancy, 13% switched or stopped the method. Of these, 89% downgraded or stopped. Of the 40 initial IUD users who did not desire pregnancy, 33% switched or stopped the method. Of these, 8% switched to IMP and 92% downgraded or stopped. The second and third methods chosen among those who switched are also shown (Figure 1).

Reasons for method discontinuation

Table 1 details the participant-reported reasons indicated for the 279 contraceptive method discontinuations and switches by method type. Among women upgrading to a new method from OCPs (N=53), 34% were due to a desire for more reliable contraception, 11% were due to headaches/dizziness/nausea, and 15% were due to unrelated reasons (including peripheral pain/weakness, other infections such as malaria or the common cold). Among women upgrading to a new method from INJ (N=8), 3 switched due to a desire for increased reliability and 2 switched due to bleeding problems.

Among women downgrading to a new method from IUD (N=12), 4 switched due to abdominal or vaginal pain, 3 switched due to expulsions, and 2 switched for unknown reasons. Among women downgrading to a new method from IMP (N=17), 6 switched due to headache/dizziness/nausea and 5 were for an unknown reason. One woman had an infection at the site of the IMP and had the IMP removed, downgrading to no method. Almost half of all discontinuations were INJ users switching to OCPs, with 78 of these women reporting bleeding problems as the reason for the switch (Table 1).

Contraceptive method discontinuation rates

The highest rates of method discontinuation/switching occurring at any point during follow-up were for INJ users (31.1/100PY), followed by IUD (20.1/100PY) and OCP users (14.8/100PY). IMP was the reversible method least likely to be discontinued (8.6/100PY). Compared to OCP users, INJ users were significantly more likely to discontinue, while IMP users were significantly less likely to discontinue. There were no significant differences between the rates of OCP and IUD discontinuation (Table 2). The proportion of women continuing their initially selected method at the end of 1 year was 84% for OCPs, 66% for INJ, 68% for IUD, and 87% for IMP.

Modeling results

The multivariate Andersen-Gill model of the recurrent outcome of time to stopping INJ/IUD/IMP or downgrading from INJ/IUD/IMP to OCP or condom/no method is shown in Table 3. Woman and man age were collinear in the multivariate, and woman age was retained. Neither intervention video was associated with downgrading, nor was the interaction of the two videos (data not shown). Younger age of woman; the woman wanting more children in next year; and the woman reporting heavy bleeding, bleeding between periods, and cystitis/dysuria were associated with method downgrading (Table 3). Incident unintended pregnancy was associated with time to stopping or downgrading from INJ/IUD/IMP (cHR=13.4; 95%CI:9.3-19.3, $p<0.001$, data not shown).

A second multivariate Andersen-Gill model showed that the man not wanting more children was associated with upgrading from OCP or condoms only to INJ/IUD/IMP/BTL, as was the women having fears or concerns about IMP. Again, neither intervention video was associated with upgrading during follow-up, nor was the interaction of the two videos (data not shown). Incident unintended pregnancy was inversely associated with time to upgrading from OCP or condoms only (cHR=0.3; 95%CI:0.1-0.8, $p=0.016$, data not shown).

Discussion

We present results evaluating contraceptive discontinuation and switching among Zambian couples with one or both partners infected with HIV. Our data suggest that although most couples continue the method they originally selected after viewing the intervention videos and being offered the full range of contraceptive services, the patterns of discontinuation and switching during follow-up are complex. Although INJs were the most popular method chosen, users experienced high rates of discontinuation and switching to less effective methods primarily due to bleeding problems. Among those selecting LARC methods, IMP was more commonly selected compared to the IUD. Furthermore, IUD users were more likely to discontinue or switch relative to IMP users, often due to abdominal pain/discomfort.

Comparable to our findings, Nanda et al found 1-year OCP and DMPA continuation rates of 81% and 78%, respectively, in Uganda, Zimbabwe, and Thailand among HIV positive and negative women [23]. The high rates of OCP continuation we observed should be interpreted with caution however, since continuation of and adherence to OCPs were measured by self-report. High rates of pregnancy observed among OCP users indicate that adherence was not consistent. Smit and Beksinska [24] report rates of switching and discontinuation among 262 South African adolescents with no prior history of hormonal contraceptive use, and noted continuation rates at 1-year of 40% and 65% for DMPA and combined OCPs, respectively. We similarly found higher rates of continuation for OCPs versus INJ, though overall we observed higher rates of continuation at 1-year, possibly due to the older age and previous contraceptive experience of our cohort. Further, as all individuals had transportation reimbursed as part of their study participation, we hypothesize that may have increased our observed continuation rates for the user-dependent methods.

Studies among HIV negative women have noted similarly low rates of IUD and IMP discontinuation at 1 year [25-28]. Our results are in contrast, however, to a randomized study in Zambia among HIV positive women where participants randomized to IUD were less likely to continue their method relative to women assigned hormonal contraception, with only 51% of the IUD group continuing at 2 years compared to 87% of the hormonal contraception group [29]. It is possible that randomization to study method may impact discontinuation rates.

Reasons for contraceptive downgrading in our study were similar to those reported in studies among HIV positive and negative women in developing countries including menstrual irregularities, headaches and dizziness, younger age, desire for fertility, or ceasing sexually activity [23, 30-35]. Counseling women specifically about expected bleeding changes and common side effects from their selected contraceptive method is important, as is correcting misconceptions regarding potential side effects that may be unrelated to contraception.

Factors associated with upgrading from OCPs or condoms only included the man not wanting children and the woman having fears or concerns about IMP. As we assessed contraceptive fears at baseline, it is possible that concerns about IMP resulted in women initially not selecting this method, but that those concerns resolved during follow-up. It is

interesting to note that the woman's fertility intentions predict whether she stops or downgrades; however, the man's fertility intentions, specifically not wanting more children, predict whether she upgrades. This indicates that a male partner definitively not wanting more children is a driving factor for upgrading contraception, and highlights the importance of male involvement in contraceptive counseling.

Fertility decisions are more complex when one member of the couple is HIV positive. Comparable to other findings by our group indicating that HIV status was not predictive of LARC uptake in multivariate analyses [36], we did not see a role for HIV status in method downgrading or upgrading behaviors in this study. Similarly, a study among HIV positive and negative couples in Malawi found that, while HIV positive individuals were more likely to desire to cease childbearing relative to HIV negative individuals, HIV positivity did not translate into higher contraception uptake [37]. Several factors may contribute to this including loss of interest, decrease in coital frequency or condom use leading the HIV positive individual to feel contraception is unnecessary, beliefs that one is too ill to become pregnant, or misconceptions about interactions between antiretroviral medications and contraception or negative health effects of modern contraception. Adapting family planning counseling interventions for couples with HIV+ women is imperative.

The intervention videos were not associated with upgrading or downgrading behaviors. Previous analyses indicate that the “Motivational” video alone influenced naming a guardian and will writing [38] and that the “Methods” video was associated with initial uptake of longer-acting contraception [18]. We similarly observed in a smaller 3-armed trial that access to contraceptives was associated with a 3-fold increase in contraceptive initiation but had no impact on incident pregnancy [39]. While a one-time video intervention appears to influence method choice and initiation, it may not be sufficient to sustain long-term adherence or prevent attrition due to side effects. Repeated messaging may be needed, as indicated by the fact that the “Methods” video in this study was predictive of lower pregnancy incidence among couples that were contracepting prior to randomization and thus had already experienced and been receptive to contraception messaging [20].

In general, we report higher rates of method continuation and LARC use than most studies, and we hypothesize that inclusion of male partners in contraceptive counseling during CVCT may increase LARC uptake and reduce method discontinuation. Male partners' desire to discontinue contraception has been documented as a common reason for method discontinuation [34]. Studies consistently show that involvement of both partners in sexual and reproductive decision making, whether it be for HIV prevention or family planning, is critical for couple-level establishment of relationship agreements that directly impact health and can help to close the gap between gender differences observed on important topics such as knowledge of contraceptive methods and attitudes toward family planning [40-42]. We recommend that researchers and policymakers prioritize ways to increase male partner involvement in order to accurately assess couple-level sexual agreements and fertility intentions.

As all couples received condoms at each visit, we cannot comment on whether couples that downgrade from their contraceptive methods continue using condoms as birth control or not.

Prior evaluation by our group noted that among discordant couples condoms were systematically used more often among the LARC users as compared to those using only condoms [36].

The strong association between contraceptive downgrading and unintended pregnancy indicates that downgraders are a very high-risk group compared to those who continue the more effective methods. Similarly, upgrading was protective for unintended pregnancy. Targeting interventions to prevent downgrading and encourage upgrading is therefore critical for maintaining the contraceptive benefit of preventing unintended pregnancy.

This study had several strengths and limitations. We feel this large cohort is representative of urban couples from disadvantaged communities with high HIV prevalence with generalizability to similar populations. [43]. In this this prospective study, we measured both contraception initiation and continuation, and considered couples to be continuing their contraception as long as they continued to re-supply their OCP, receive their injection at the research clinic, or did not seek removal of their LARC method. Couples chose their own method, making our findings more generalizable to practical settings than if women had been randomized to receive a method. However, there may be limited external validity outside the context of couples' services. Additionally, we hypothesize that women who were lost to follow-up are less likely to continue to adhere to their selected contraceptive method, leading to a potential selection bias for those more motivated to receive care and less likely to discontinue their contraceptive method. Though we assessed several important time-varying covariates, some covariates that could potentially change during the course of the study including fertility intentions and fears about contraceptives were only assessed at baseline. As fertility intentions may be a strong motivator of effective contraceptive use, the different contraceptive use patterns observed may reflect altering fertility intentions of this cohort. Lastly, several of our variables, such as OCP adherence and side effects, were measured by self-report and may be unreliable.

The literature broadly supports that LARCs are the most effective methods for unintended pregnancy prevention, offer a much more affordable [44] and a potentially hormone-free option in the case of IUD, and should be widely promoted. A better understanding of the obstacles to LARC method promotion at the provider level and uptake at the client level is needed. Discussing all available methods of contraception in one counseling session may overwhelm couples with information; since knowledge of OCPs and injections is already very high, focusing on IUD and implant education, as well as BTL and vasectomy where available, for couples wanting to limit or delay childbearing may be a more practical and impactful strategy. This study did not give counseling based on fertility goals, but in a separate study with Zambian and Rwandan couples, LARC uptake increased by 140 to 200% among couples wanting to limit or delay pregnancy at least 3 years [36].

Conclusions

We recommend these findings be used to improve the uptake and continuation of effective contraceptive methods, and that family planning services for couples be offered as a core

component of HIV testing and other prevention services. LARC methods should be promoted among couples desiring to limit or delay childbearing.

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Figure 1. Descriptive flow diagram of contraceptive method use, discontinuation, switching, and pregnancies occurring during follow-up OCP: oral contraceptive pill; INJ: injectable contraception; IUD: intrauterine device; IMP: implant. Condoms were provided to all couples and are not considered in this flow diagram. N = 12 clients selected tubal ligation (no pregnancies observed after tubal ligation)

Table 1
Self-reported reasons for stopping or switching methods among women who did not desire pregnancy by method subsequently chosen

	Bleeding Problems	Headache/ Dizziness/ Nausea	Abdominal/ Vaginal Pain	Cardio-vascular symptoms	Weight change	Unrelated reasons#	Not sexually active	Accessibility	Reliability	Unknown	Miscellaneous *	Method or user failure	Total
	N	N	N	N	N	N	N	N	N	N	N	N	N
Upgrade													
OCP to INJ	3	6	4	4	0	7	0	1	15	7	0	0	47
OCP to BTL	0	0	0	0	0	0	0	0	1	1	0	0	2
OCP to IMP	0	0	0	0	1	0	0	0	2	0	0	0	3
OCP to IUD	0	0	0	0	0	1	0	0	0	0	0	0	1
INJ to BTL	1	0	0	0	0	0	0	0	1	1	0	0	3
INJ to IUD	0	0	0	0	0	1	0	0	0	0	0	0	1
INJ to IMP	1	0	0	0	0	0	0	0	2	1	0	0	4
IMP to BTL	0	0	0	0	0	0	0	0	0	1	0	0	1
Lateral moves													
IMP to IUD	0	0	0	1	0	0	0	0	0	0	0	0	1
IUD to IMP	0	0	0	0	0	0	0	0	0	1	0	0	1
Downgrade/stop													
INJ to OCP	78	7	4	6	2	18	5	1	0	11	2	0	134
INJ to nothing	8	0	1	2	0	9	4	0	0	0	3	0	27
OCP to nothing	3	3	1	0	0	9	4	1	0	1	3	0	25
IMP to INJ	0	0	0	0	0	0	0	0	0	2	0	0	2
IMP to OCP	1	5	0	0	1	0	0	0	0	0	0	0	7
IMP to nothing	1	1	0	0	0	1	0	0	0	3	1	1	8
IUD to INJ	0	0	1	0	0	0	0	0	0	1	0	1	3
IUD to OCP	1	0	3	0	1	0	1	0	0	1	0	1	8
IUD to nothing	0	0	0	0	0	0	0	0	0	0	0	1	1
Total	97	22	14	13	5	46	14	3	21	31	9	4	279
													100%

* Miscellaneous includes wanting to take a rest from contraception, myths about contraception

[#]Unrelated reasons are self-reported reasons not directly related contraception (other infections including malaria and common cold, peripheral pain/weakness)
OCP: oral contraceptive pill; INJ: injectable contraception; IUD: intrauterine device; IMP: implant; BTL: tubal ligation.
Condoms were provided to all couples and are not considered in this table

Table 2
Rates of method discontinuation among women who did not desire pregnancy

	Number of discontinuations	Follow-up time (PY)	Discontinuation incidence (per 100 PY)	95%CI	p value [*]
OCP	78	527.5	14.8	11.8 18.5	ref
INJ	169	544.0	31.1	26.6 36.0	<0.0001
IUD	13	64.7	20.1	11.2 33.5	0.310
IMP	19	221.1	8.6	5.3 13.2	0.028
BTL [#]	0	29.1	0.0	0.0 6.4	0.015
Total	279	1386.5	20.1	18.8 23.5	

^{*} Mid-p exact test (2-tail)

[#] Normal approximation

OCP: oral contraceptive pill; INJ: injectable contraception; IUD: intrauterine device; IMP: implant; BTL: tubal ligation

Table 3
Andersen-Gill models of factors associated with downgrading from INJ/UD/IMP to OCP or condoms/no method

	UNIVARIATE			MULTIVARIATE		
	cHR	95%CI	p value	aHR	95%CI	p value
Arm of trial						
Methods video	ref					
No Methods video	1.08	0.81 1.44	0.605			
Arm of trial						
Motivational video	ref					
No Motivational video	0.96	0.68 1.34	0.800			
<u>Sociodemographics</u>						
Age of woman (per year increase)	0.95	0.92 0.97	<0.001	0.94	0.90 0.98	0.004
Age of man (per year increase)	0.96	0.93 0.98	<0.001		n/a	
No. living children (per child increase)	0.84	0.72 0.98	0.026	0.95	0.79 1.13	0.539
<u>Family planning and behavioral</u>						
Woman fertility intentions						
Wants more children in the next year	4.31	2.09 8.90	<.0001	5.78	2.17 15.43	0.001
Wants more children, not in next year	1.66	1.21 2.29	0.002	1.43	0.92 2.22	0.116
Does not know	2.09	0.92 4.75	0.080	1.23	0.36 4.17	0.739
Does not want more children	ref			ref		
Man fertility intentions						
Wants more children, not in next year	1.43	1.05 1.93	0.022	1.09	0.69 1.70	0.720
Does not know	1.75	1.00 3.06	0.051	1.79	0.91 3.53	0.095
Does not want more children	ref			ref		
Contraception methods ever used (past or at enrollment) (ref = Yes)						
OCPs	1.39	1.04 1.86	0.028	1.21	0.81 1.81	0.343
INJ	1.45	1.07 1.97	0.016	1.35	0.89 2.05	0.156

UNIVARIATE					MULTIVARIATE			
	cHR	95%CI	p value	aHR	95%CI	p value		
IMP or IUD	1.68	0.69	4.08	0.254				
<i>Side effects (reported in past 3 months, time-varying)</i>								
Heavy menstrual bleeding								
Yes, treated or self-report	3.76	2.45	5.76	<.0001	3.72	2.10	6.59	<.0001
No	ref				ref			
Irregular bleeding								
Yes, treated or self-report	2.10	1.38	3.19	0.001	1.42	0.81	2.50	0.221
No	ref				ref			
Lower abdominal pain								
Yes, treated or self-report	2.54	1.46	4.41	0.001	1.27	0.52	3.08	0.603
No	ref				ref			
Bleeding between periods								
Yes, treated or self-report	3.79	2.54	5.65	<.0001	2.88	1.69	4.90	<.0001
No	ref				ref			
Cystitis/dysuria								
Yes, treated or self-report	2.63	1.38	4.99	0.003	3.14	1.38	7.17	0.007
No	ref				ref			

OCP: oral contraceptive pill; INJ: injectable contraception; IUD: intrauterine device; IMP: implant; BTL: tubal ligation Reference group: Women who continued INJ/IUD/NOR or upgraded

Additional factors evaluated and not found to be significant in the univariate analysis included: Woman understands Nyanja, man understands Nyanja, monthly household income, who decides when/if you should have children (reported by woman), baseline HIV status or stage of HIV disease, who decides when/if you should have children (reported by man), number of lifetime sexual partners reported by woman (per partner increase), age at first intercourse reported by woman (per year increase), pre-randomization contraceptive use, worries or concerns about contraception (OCP, INJ, IMP, IUD, BTL), number of sex partners in last 3 months reported by woman (time varying), and vaginal discharge or dyspareunia (time-varying), sex with spouse with or without a condom (time varying).

Table 4
Andersen-Gill models of factors associated with time to upgrading from OCP or condoms/no method

	UNIVARIATE				MULTIVARIATE			
	cHR	95%CI	p value	aHR	95%CI	p value		
Arm of trial								
Methods video	1.08	0.68	1.70	0.755				
No Methods video	ref							
Arm of trial								
Motivational video	0.54	0.28	1.05	0.068				
No Motivational video	ref							
<i>Family planning and behavioral</i>								
Man fertility intentions								
Wants more children, not in next year	0.47	0.28	0.79	0.004	0.48	0.27	0.85	0.012
Does not know	0.63	0.20	2.03	0.441	0.41	0.10	1.71	0.222
Does not want more children	ref							
Woman has worries, concerns, or fears about (ref = No)								
OCPs	0.99	0.47	2.06	0.969				
INJ	1.22	0.74	2.02	0.438				
IMP	1.87	1.15	3.06	0.012	1.80	1.10	2.93	0.020
IUD	0.76	0.45	1.27	0.293				
BTL	0.58	0.33	1.00	0.052				
<i>Health (reported in past 3 months, time-varying)</i>								
Dyspareunia								
Yes, treated or self-report	3.71	1.14	12.08	0.030	1.11	0.12	10.50	0.929
No	ref							
Vaginal discharge								
Yes, treated or self-report	3.17	1.14	8.80	0.027	1.95	0.39	9.62	0.414
No	ref							

OCP: oral contraceptive pill; INJ: injectable contraception; IUD: intrauterine device; IMP: implant; BTL: tubal ligation Reference group: Women who continue OCP, downgrade from OCP, or continued condoms/no method

* No women with the outcome report the exposure

Additional factors evaluated and not found to be significant in the univariate analysis included: Age of man or woman, number of living children, woman understands Nyanja, man understands Nyanja, monthly household income, who decides when/if you should have children (reported by woman), who decides when/if you should have children (reported by man), baseline HIV status or stage of HIV disease, number of lifetime sexual partners reported by woman (per partner increase), age at first intercourse reported by woman (per year increase), number of sex partners in last 3 months reported by woman (time-varying), pre-randomization contraceptive use, contraceptive methods ever used (past or at enrollment), woman's fertility intentions, sex with spouse with or without a condom (time varying), cystitis/dysuria or bleeding between periods or lower abdominal pain or irregular bleeding or amenorrhea or heavy menstrual periods (time varying)