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ABSTRACT

Much of the research literature about the use of family planning generalizes contraceptive use among all women, using age as a covariate. In Uganda, a country with divergent trends in modern family planning use among younger and older married women, we hypothesize that factors associated with contraceptive use operate in a fundamentally different way among married women in two age groups: 15-24 and 25-34. We tested this hypothesis using data from the Uganda Demographic and Health Survey (UDHS) in 2006 and 2011.

We restricted the sample from each round to fecund, non-pregnant married women age 15-34 who were sexually active within one year prior to the survey, resulting in a sample of 2,802 women in 2006 and 2,814 women in 2011. In Uganda, as in most countries, the level of modern contraceptive use is much lower among younger married women compared with older women.

We used logistic regression to model the relationship between selected independent variables and the outcome variable (current use of modern contraception) for each group of women in each year. We found that the key factors associated with current use of modern contraceptives among younger married women age 15-24 in both 2006 and 2011 were residence and desire for children, while among women age 25-34, the significant factors associated with contraceptive use in both rounds were education level, household wealth and desire for children.

The findings suggest that increasing secondary education for women and improving the livelihood of the population overall is important. Family planning programs should be intensified to meet the needs of young married women in rural areas of the country.

Keywords: Family planning, modern contraception, DHS, Uganda, young women, age differences

INTRODUCTION

For countries that have achieved Millennium Development Goal 5 on improving maternal health, meeting women's contraceptive needs has played an important role. MDG 5a aims to reduce the maternal mortality ratio by three-quarters between 1990 and 2015, and MDG 5b aims to achieve universal access to reproductive health, including family planning (United Nations 2012). According to the World Health Organization in 2012, satisfying the unmet need for family planning alone could cut the number of maternal deaths by almost a third. However, an estimated 215 million women who would prefer to delay or avoid pregnancy continue to lack access to safe and effective contraception (WHO 2012). Thus along with providing skilled maternal care, offering family planning is crucial to averting maternal deaths.

Although many United Nations member countries, particularly those in the developed world, have strong family planning programs, this is not the case in sub-Saharan Africa, where despite a rise in contraceptive prevalence, many women continue to have unmet need for contraception (UNFPA 2012; Cleland et al. 2006). The resultant high fertility is associated with high levels of maternal mortality, especially among the poorest communities.

Globally, the maternal mortality ratio remains high, at 287 maternal deaths per 100,000 births; a large proportion of these deaths occur among young women (WHO et al. 2010). In Uganda, the maternal mortality ratio was estimated to be much higher than the worldwide average in 2011, at 438 per 100,000 births (UBOS and ICF International 2012). An estimated one-third of women who give birth in developing countries are below age 20, which exposes them to greater risk of illness and death related to maternal causes (WHO 2010).

In Uganda as in many other countries, major factors associated with contraceptive use are women's age, education, and socioeconomic status. Ugandan women who are more educated and wealthier are more likely to use contraception compared with illiterate and less wealthy women (UBOS and Macro International 2007). Similarly, women who use contraceptives tend to have a better quality of life, higher social status, and greater autonomy. This association has been highlighted in a study in Nigeria by Osemwenkha, who emphasized that contraceptive use has the power to reduce fertility considerably and ultimately to improve maternal and child health (Osemwenkha 2004).

Understanding the key factors influencing contraceptive use among young married women who are at risk of unwanted pregnancies is key to the development of effective family planning programs. Given the context of high fertility in Uganda, our study seeks to explore the socio-economic and demographic factors associated with contraceptive use among young married women age 15-24 compared with older women age 25-34 in Uganda. The study focuses on married women because, in Uganda, the majority of births occur within marriage.

BACKGROUND

According to the 2011 Uganda Demographic and Health Survey (UDHS), Uganda has a young population (52% are below age 15, and 17% are age 15-24) and a high total fertility rate (TFR), at 6.2 children per woman. As this large cohort of young people enters the childbearing years, their reproductive behavior will determine the growth and size of Uganda's population for decades to come.

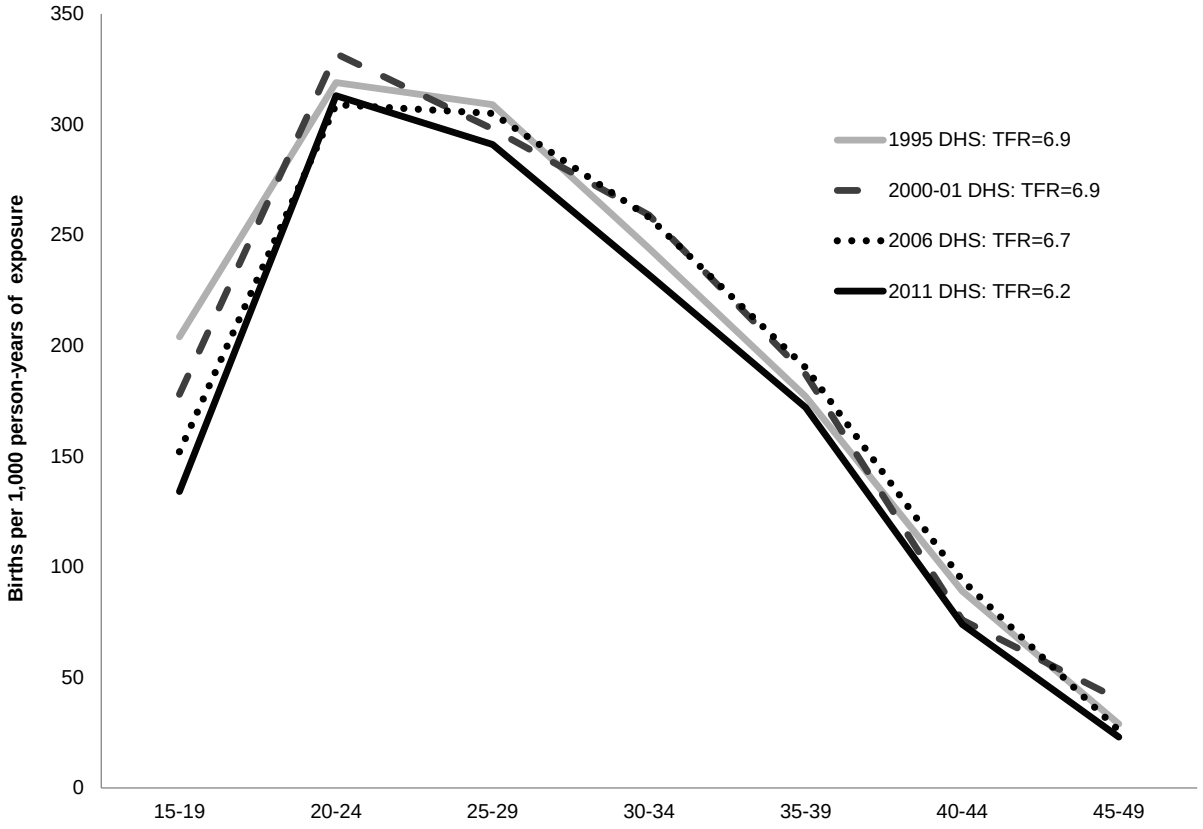
Figure 1 shows age-specific fertility rates in Uganda from 1995 to 2011. Fertility rates have remained persistently high over the past 16 years. As in other developing countries, Ugandan women age 20-24 have the highest contribution to the TFR, The largest decline in fertility has been among women age 15-19. The probable reasons for this decline could be the introduction of free Universal Primary Education, which has kept girls in school, resulting in delayed marriages.

Uganda still struggles with a low contraceptive prevalence rate (CPR) of 30%, which is lower than that of her neighbors, Kenya, Rwanda, and Tanzania, which had a CPR of 46%, 52%, and 34%, respectively, at the time of their last surveys (ICF International 2012).

According to Blanc et al. (2009), in developing countries, contraceptive use among young women, whether married or unmarried, involves a lot of experimentation and is inconsistent. Additionally, young women face many barriers to the use of family planning services, which include fear, embarrassment, cost, and lack of knowledge (Blanc et al. 2009). In the Ugandan context, only 10% of all Ugandan women and 14% of married women age 15-24 are using any contraceptive method (UBOS and Macro International 2007).

Whereas age at first marriage has generally increased around the world, several parts of sub-Saharan Africa are struggling with a significant proportion of girls being married off before their 18th birthday (UNICEF 2005). Early marriage exposes these women to frequent and unprotected sexual intercourse, which can lead to early and risky first birth (Mensch 1998; Haberland 2005). In Uganda, the median age at first marriage is 17.9 years, and young women are expected to prove their fertility soon after marriage (UBOS and ICF International 2012). In addition, these women have a limited chance to space their births, since contraceptive use within marriage is not expected.

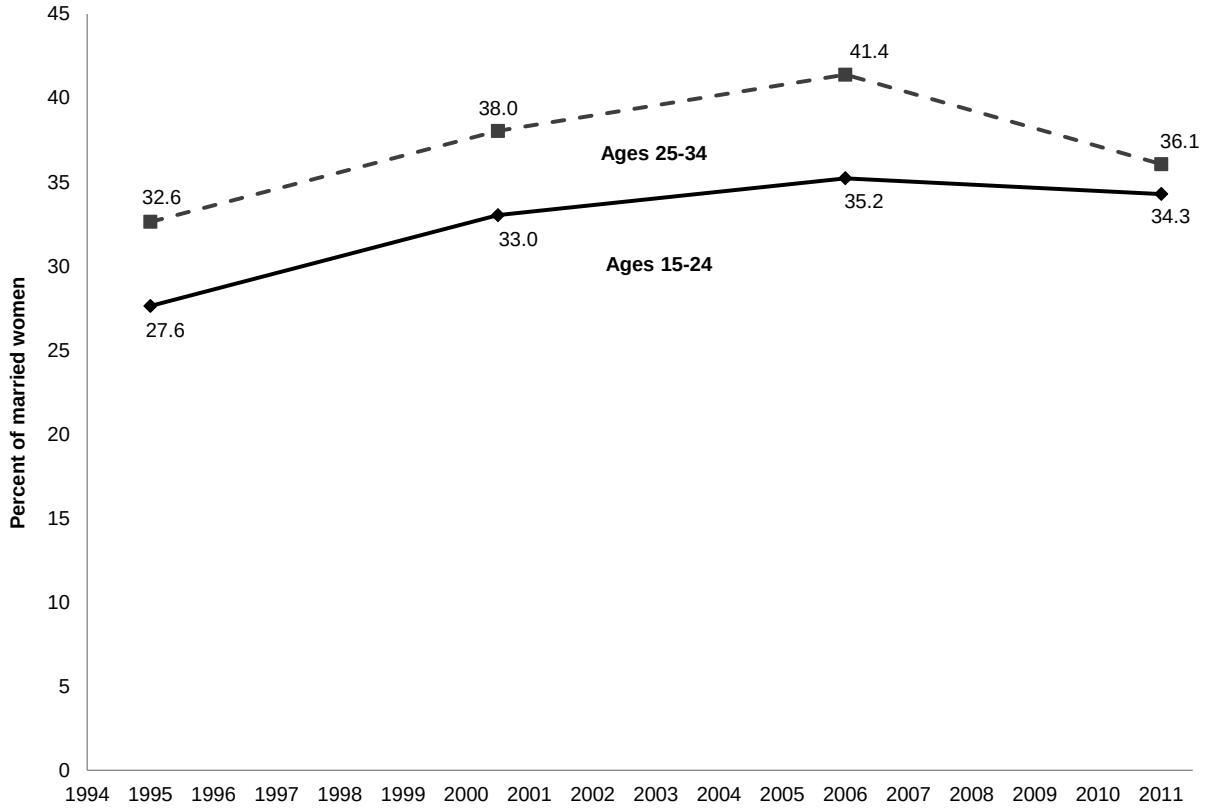
Figure 1. Age-specific fertility rates, Uganda, 1995-2011



Source: ICF International, 2012. Computed for three years prior to the survey

Figure 2 shows that levels of unmet need have increased among married women age 25-34 and age 15-24 over the last 25 years. From 2006 to 2011, unmet need decreased among married women age 25-34 and declined slightly among women age 15-24, and the level of unmet need between the two groups has nearly converged. Variations in unmet need by age group justify investigating whether any unique factors affect contraceptive use for married women age 15-24 compared with factors affecting married women age 25-34.In Uganda, women get married when they are still young, and therefore most births are expected culturally to be within a marriage setting. Our study sought to further explore the factors associated with contraceptive use among young and older married, fecund, sexually active, non-pregnant women in Uganda, for which existing literature does not provide concrete evidence.

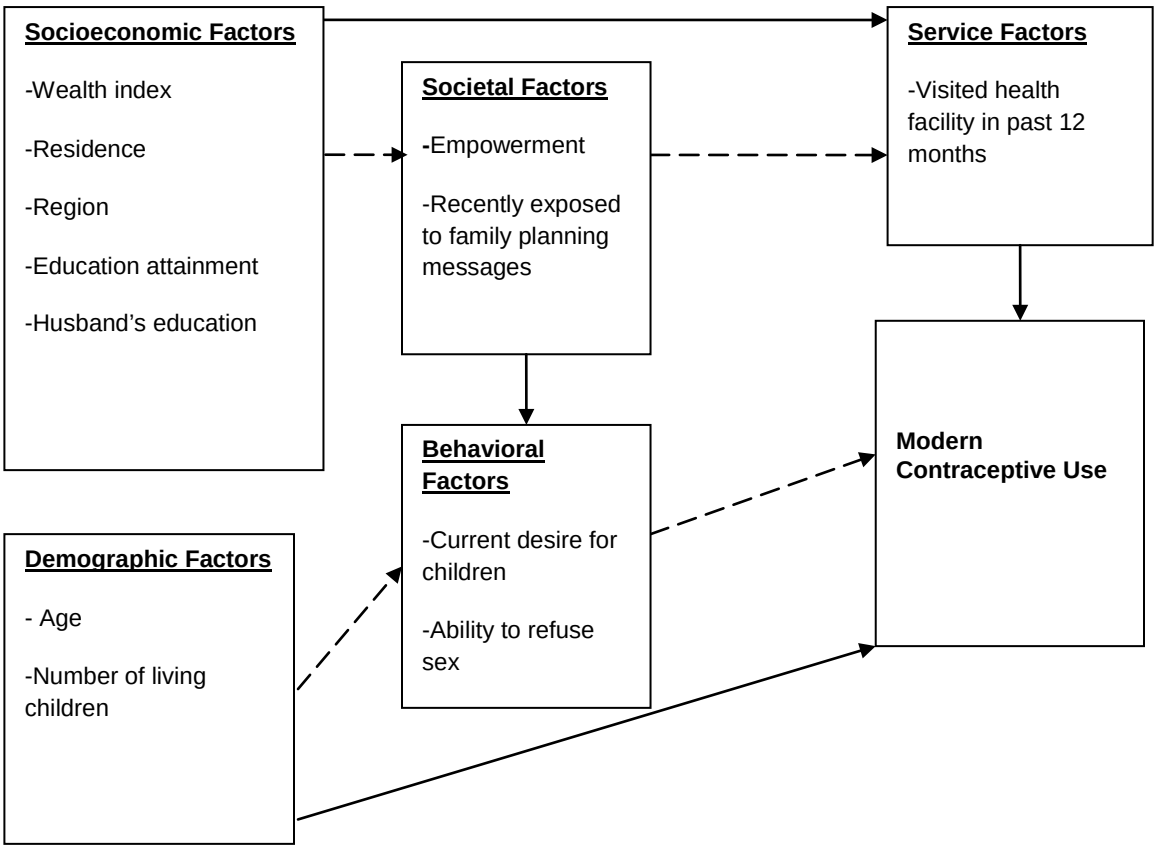
Figure 2. Unmet need for family planning, married women, Uganda, 1995-2011



Source: ICF International, 2012.

CONCEPTUAL FRAMEWORK

Figure 3. Conceptual framework for determinants of modern contraceptive use



Many researchers have examined the determinants of contraceptive use, from both the providers' and clients' perspectives (Cleland et al. 2006). The customized conceptual framework builds on existing knowledge to analyze the socio-economic and demographic factors associated with contraceptive use among young married women compared with older women in Uganda. While the framework used is generalized for both the young women and older women, we hypothesize that the factors associated with contraceptive use may operate differently within each age group due to differences such as empowerment, education, and desire for children. This hypothesis is premised on the fact that, as in many of the least-developed countries, health services and policies in Uganda are not clearly streamlined to consider the special needs of young women (Healthy Action 2011).

In our analysis we consider the socioeconomic and demographic factors associated with modern contraceptive use among young married women compared with older women. On an individual level, these factors include educational attainment, husband's education, marital status, age, and current desire for children.

Since individuals act and react within a society and culture, the analysis considers that these factors operate through intermediate factors that generally act as catalysts to increase or decrease contraceptive use among women. These factors are both societal and behavioral in nature. Factors measured include exposure to family planning messages in the mass media, women's empowerment, women's residence (rural or urban), wealth, and region of the country. To measure women's empowerment, the DHS survey asked women about their decision-making, as a proxy indicator. Women were asked who makes decisions on: visiting a family relative, large family purchases, daily household purchases, and own health care.

Other latent factors are associated indirectly with contraceptive use among young and older women and their decisions to use contraceptives. These include family planning providers' attitudes, women's access to family planning services, and availability of family planning services. These latent factors have not been included in the regression modeling but were important informative variables during our literature search.

DATA AND METHODS

Data Source and Data Description

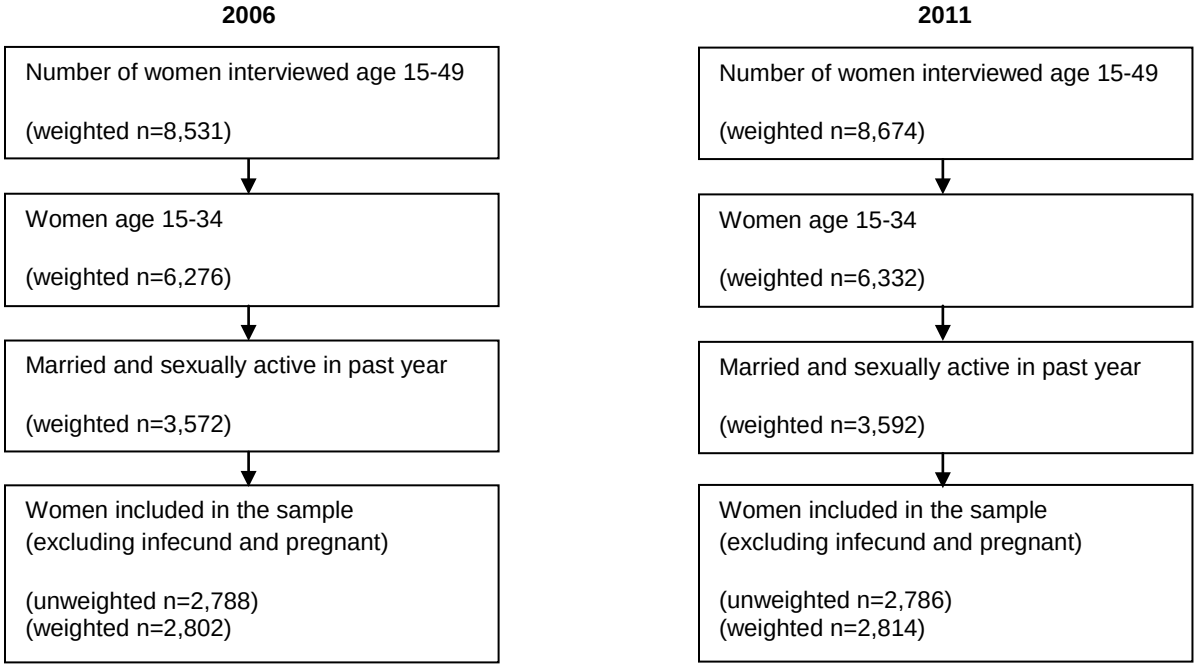
The paper used secondary data from the 2006 and 2011 Uganda Demographic and Health Surveys (UDHS). In both surveys, two-stage cluster sampling was used to generate a nationally representative sample of households. In the 2006 UDHS, some areas of the north (especially Karamoja region) were oversampled, including some refugee camps, to obtain specific indicators for these areas due to insecurity and the after-effect of Lord's Resistance Army insurgency. Sampling methods are detailed in each final report (UBOS and ICF International 2007, and 2012). The first stage involved selecting clusters from sampling frames used in recent nationwide surveys, followed by the second stage, which selected households in each cluster. Stratification of urban and rural areas was taken into account. A total of 8,531 women age 15-49 were interviewed in 2006, and 8,674 women in 2011.

Study Sample

The statistical analysis focuses only on married1 women age 15-34 years who were sexually active in the last year before the survey and who are not pregnant or infecund, comprising a weighted sample size of 2,802 in 2006 and 2,814 in 2011. Figure 4 shows how this subsample was derived in each survey. In order to ensure representativeness across the country and to correct for non-response, data used were weighted and took into consideration the complex survey design in the analyses, using the SVY command in Stata.

[1] In the DHS, women are considered to be currently married if they report that they are "married or living with a man as if married."

Figure 4. Sample selection procedure



Variables

The main variable of interest (dependent variable) was modern contraceptive use, which is binary in nature (non-use or use). Modern methods of family planning refer to safe, effective and legal methods to prevent pregnancy such as the pill, condoms, injectables, and the Intra-Uterine Device (IUD).

The explanatory (independent) variables in the study are women's education, wealth index, administrative region of the country, residence (urban or rural), exposure to family planning messages on radio, television, or newspapers in the past few, desire for children, husband's education, women's empowerment, ability to refuse sex, and visited health facility in the past 12 months.

In the final model, only variables that passed the multicollinearity test were included, with none of the variables having a VIF greater than 3 (see Appendix 1). Empowerment was thought to be an important variable in the analysis. As mentioned above, the survey asked women about who makes decisions about four areas: major household purchases, daily household purchases, visits to family relatives, and own health care. The possible answers to

these questions were: woman alone, woman with husband, husband alone, or another person altogether.

If the woman indicated that she had a say in a decision, whether by herself or jointly with her husband, she received a score of 1. Based on the responses to these four questions, an empowerment index was constructed. Respondents were classified into three groups: low (0), medium (1-2), and high (3-4), depending on the number of decisions in which the woman said that she had a say.

A woman's ability to refuse sex with her husband, also asked in the surveys, was considered separately from the empowerment index, both because it is more directly related to use of family planning and because the measure is constructed differently than the measure of empowerment. That is, women were asked whether they could refuse sex or not.

Family planning use in the highest wealth quintile is nearly double that of the next quintile, leading us to hypothesize that the top quintile should be considered separately from other groups. Therefore, wealth scores were collapsed into three groups: bottom 40%, middle 40% and top 20%. .

The education variable was divided into three categories—no education, primary, and secondary, based on the highest grade of schooling the respondent had attended. Attending school rather than obtaining a degree was used as a metric of education so that teenage women attending school or who might soon attend secondary school would not be excluded from those over age 18, who have had a chance to complete their degree.

The regions used in DHS reports were regrouped into the four Ugandan administrative regions for the purpose of the analysis. Figure 5 shows reclassification of regions in 2006 and Figure 6 shows reclassification of regions in 2011. In both years, Central 1, Central 2, and Kampala were grouped into the Central administrative region; East Central and Eastern were grouped into Eastern administrative region; and Western and Southwest were grouped into the Western administrative region. In 2011, due to demand for specific indicators for the highly disadvantaged region of Karamoja, it was separated as an area within the DHS Northern region. However, the collapsed Northern administrative region is comparable across years.

Figure 5. Regional groupings, UDHS 2006

Figure 6. Regional groupings, UDHS 2011

Methods

The paper starts with descriptive exploration of both dependent and independent variables. At the multivariate level, the relationship between selected variables of interest and the dependent variable (current use of modern contraception) was estimated using a multiple logistic regression model. Given that the core analytical strategy in this paper focuses on two age groups of women, young and older, the models are run separately by age groups within each survey year.

Dummy variables were created and used to select socioeconomic and demographic variables in the logistic regression model. Results were accepted at the 95% confidence level. The full regression model was also tested for goodness of fit using the Archer-Lemeshow goodness-of-fit test in Stata (2006). This model is based on the earlier Hosmer-Lemeshow test (1980) but adjusts for complex survey samples. The null hypothesis under the goodness of fit is that the model is a good fit, implying that probabilities greater than 0.05 using the 95% level of confidence were taken to be a good fit.

Data Limitations

One major limitation of this dataset was heaping in some categories, for example education level. In this instance, women who had stopped at primary level three were considered to be equal to those who had completed primary level seven. This categorization was necessary because women under age 18 might currently be pursuing secondary education but might not yet have had the chance to complete their education.

Another limitation of the study was that some desired aspects in the conceptual framework, for example experience of an abortion and woman's HIV status, could not be adequately operationalized to allow analysis using the available dataset.

RESULTS

This study provides descriptive statistics about sexually active, fecund, non-pregnant married women age 15-24 (young) and age 25-34 (older). Table 1 shows the composition of women in each age group by year characteristics from the conceptual framework, including women's education, wealth index, region of the country, residence (urban or rural), and exposure to family planning messages. Statistically significant differences were tested using the chi-square test between the two groups of women in each survey year.

Table 1 shows that in 2006 and 2011, younger women were better educated than women age 25-34. For example, in 2006, 87% of women age 15-24 compared with 79% of women age 25-34 reported primary, secondary, or higher education. Between the two surveys, education attainment seems dramatically improved in both groups.

In regard to household wealth status, younger women seem to be more financially disadvantaged than older women in our sample, both in 2006 and 2011. In 2006, 46% of women age 15-24 were in the bottom 40% wealth group compared with 37% of women age 25-34. Young women's situation (relative to others) improved slightly in 2011.

In 2006, distributions of the two age groups across administrative regions were similar. In 2011, younger women were more likely than older women to live in the Eastern administrative region and less likely to live in the Western region.

The majority of women studied wanted to have the next child two years later. In both surveys, younger women showed stronger fertility desire than older women. A smaller percentage of women age 15-24 than age 25-34 wanted to limit or delay childbearing at least two years. In 2011, 26% of women age 15-24 wanted a child within two years compared with 16% among women age 25-34.

Younger women generally appear to be less empowered than older women. In 2006, for example, 15% of married women age 25-34 had a low empowerment score compared with 20% among the younger group, age 15-24. The difference was similar in 2011. Conversely, older women were more likely to have high empowerment scores, at 59% of women age 25-34 in 2006 compared with 48% among women age 15-24. However, women's empowerment appears to

have weakened between the two surveys. A smaller percentage of women in both age groups had high empowerment scores in 2011 than in 2006 (see Table 1).

Nonetheless, women's ability to refuse sex increased between 2006 and 2011. In the 2006 survey 78% of all women studied said they could refuse sex; in 2011 the comparable percentage was 86%. The percentages were similar for both age groups.

Exposure to family planning message was particularly high in 2011. In both age groups 76% of women reported to have been exposed to family planning message in the media (radio, television, newspaper) in the past few months preceding the survey. In both surveys, the difference between the two age groups is not significant.

Table 1. Composition of sexually active married women by age group, 2006 and 2011

	2006			2011		
	Age group			Age group		
Background characteristics	**15-24**	**25-34**	**Total**	**15-24**	**25-34**	**Total**
Education attainment						
No education	12.8	21.0	17.7	5.0	13.3	10.1
Primary	67.8	60.6	63.6	66.9	59.4	62.3
Secondary+	19.4	18.4	18.8	28.1	27.3	27.6
p-value	0.0000			0.0000		
Wealth Index						
Lowest 40%	*45.9*	*36.8*	*40.5*	*43.0*	*36.5*	*39.0*
Middle 40%	*33.3*	*40.9*	*37.8*	*34.5*	*36.5*	*35.7*
Highest 20%	*20.9*	*22.3*	*21.7*	*22.5*	*27.0*	*25.3*
p-value	0.0002			*0.0130*		
Administrative region						
Central	25.9	28.2	27.3	29.9	31.0	30.6
Eastern	24.4	23.7	24.0	30.3	24.1	26.5
Northern	22.1	20.9	21.4	17.6	17.9	17.8
Western	27.6	27.2	27.4	22.3	27.0	25.2
p-value	*0.7393*			*0.0093*		
Residence						
Urban	16.8	14.8	15.6	19.5	20.1	19.9
Rural	83.2	85.2	84.4	80.5	79.9	80.1
p-value	*0.2681*			*0.7339*		

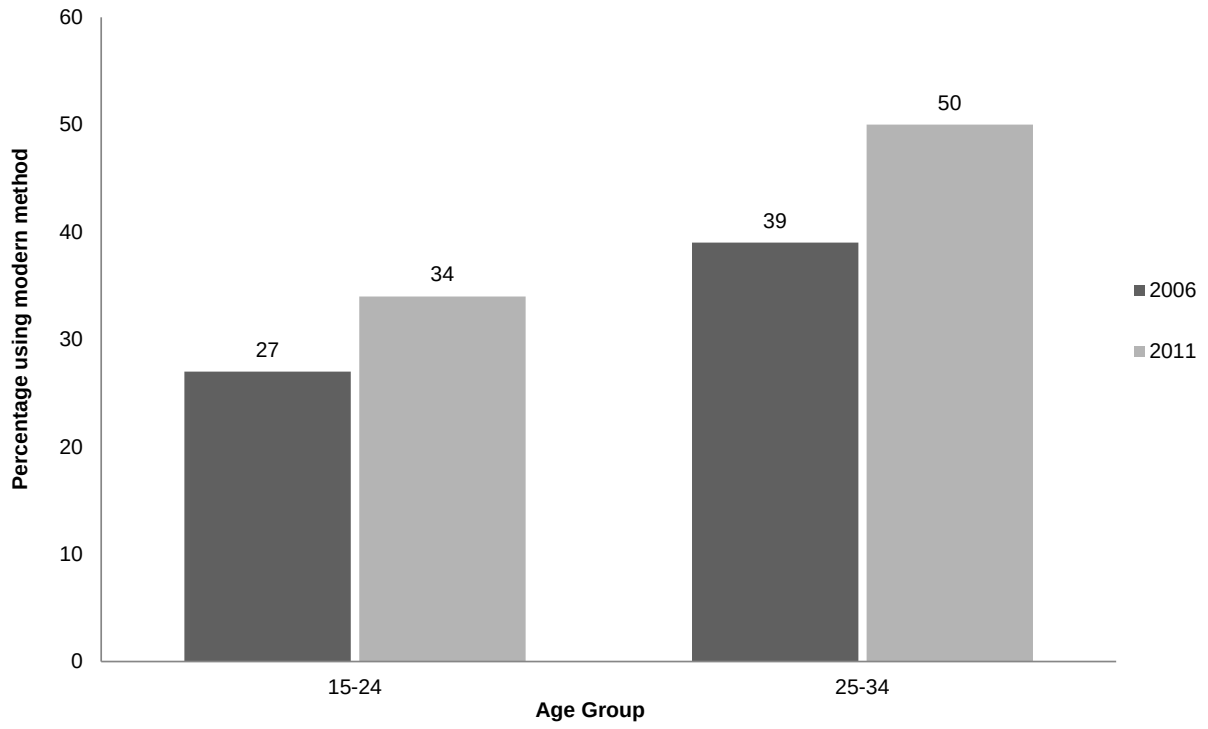
Cont'd..

Table 1. Cont'd

	2006			2011		
	Age group			Age group		
Background characteristics	**15-24**	**25-34**	**Total**	**15-24**	**25-34**	**Total**
Family planning messages						
Did not hear family planning message in past few months	40.4	37.0	38.4	23.9	24.1	24.0
Heard family planning message on radio, TV, or newspaper in past few months	59.6	63.0	61.6	76.1	75.9	76.0
p-value	*0.0838*			*0.9124*		
Desire for children						
Wants within 2 years	30.2	18.1	23.0	25.7	16.4	20.0
Wants after 2 years	65.8	74.6	71.0	72.4	78.0	75.8
Do not want any more	4.0	7.4	6.0	2.0	5.6	4.2
p-value	*0.0000*			*0.0000*		
Husband's education level						
No education	6.8	9.7	8.5	5.3	7.0	6.4
Primary	59.4	60.4	60.0	51.0	53.2	52.4
Secondary+	33.8	29.9	31.5	43.7	39.8	41.2
p-value	*0.0001*			*0.0000*		
Can refuse sex						
No	23.1	21.7	22.2	13.4	13.7	13.6
Yes	76.9	78.3	77.8	86.6	86.3	86.4
p-value	*0.4188*			*0.8577*		
Empowerment Index						
Low	20.1	15.0	17.0	22.3	17.0	19.0
Medium	30.7	26.1	28.0	40.0	35.7	37.3
High	48.2	58.9	55.0	37.8	47.4	43.7
p-value	*0.0001*			*0.0004*		
Visited health facility in last 12 months						
No	26.5	24.0	25.0	24.1	22.7	23.2
Yes	73.5	76.0	75.0	75.9	77.3	76.8
p-value	*0.1805*			*0.4879*		
Average number of living children	1.7	4.0	3.1	1.7	3.7	2.9
Number of women (weighted)	1,144	1,658	2,802	1,076	1,738	2,814

Figure 7 shows the proportion of married sexually active women using modern methods by age group, for both survey years. In 2011, contraceptive use among sexually active women (excluding pregnant and infecund women) age 15-24 was lower, at 34%, than among women age 25-34, at 50%. Contraceptive use increased more among the older group of women than the young group between 2006 and 2011 (see Figure 5).

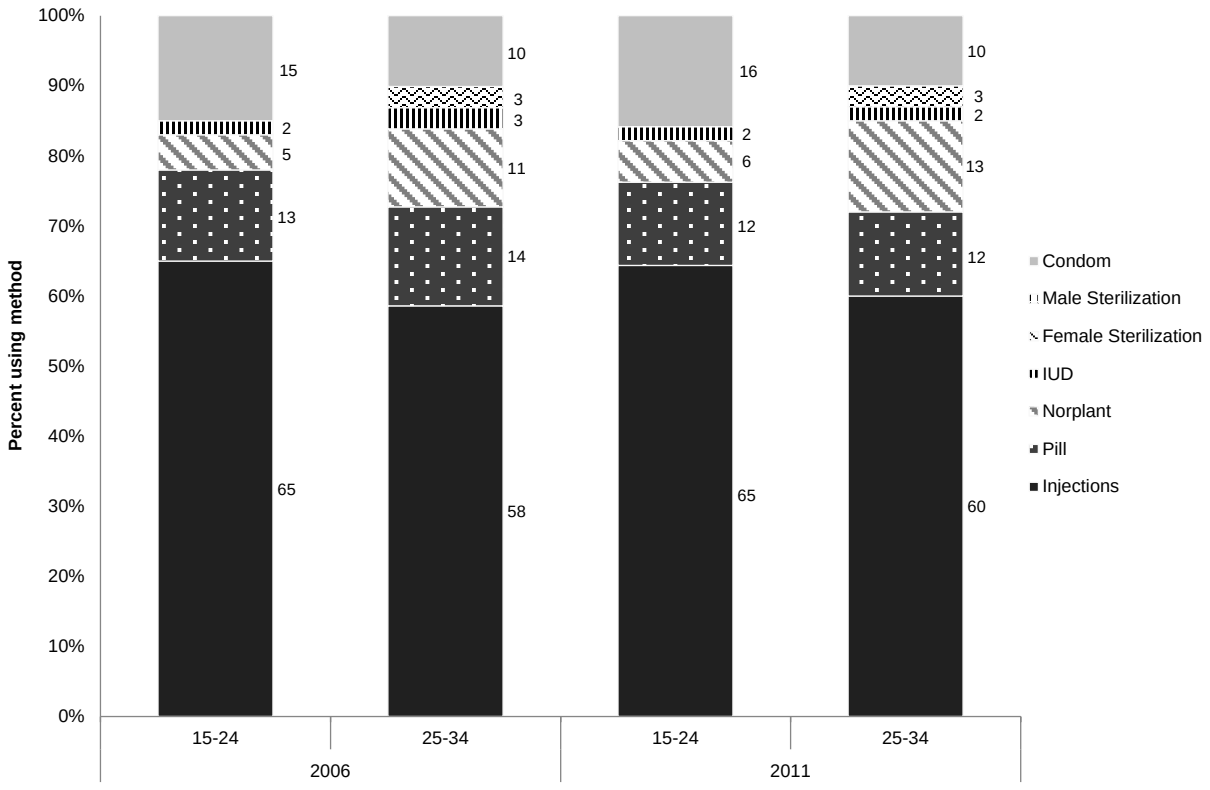
Figure 7. Current use of modern contraception by married* sexually active women age 15-24 and age 25-34, 2006 and 2011, Uganda



* Married women who have been sexually active in the past 12 months, are fecund and not pregnant.

Figure 8 shows the contraceptive method mix among sexually active married women for 2006 and 2011. Injections were the predominantly used method among both the young and the older women. Use of injections was greater among young women than older women. The figure also shows that use of condoms and the pill was second to use of injections, though at relatively low levels.

Figure 8. Contraceptive method mix, married women*, Uganda 2006 and 2011



* Married women who have been sexually active in the past 12 months, are fecund and not pregnant.

This study also explored factors that might be associated with contraceptive use at a bivariate level of analysis, using the chi-square test to compare family planning use within each age group by survey year. Table 2 shows the percentage of women in each age group currently using a modern contraceptive method by selected characteristics of the women, including education, household wealth status, region, residence, exposure to family planning messages, fertility desire, partners' education, women's ability to refuse sex, empowerment index, and contact with family planning health facilities.

Results reveal that, in each age group, education level, wealth index, region, residence (urban-rural), and desire for children are significantly associated with contraceptive use, both in 2006 and in 2011. The likelihood of using contraception is associated with women's educational attainment. The more schooling a woman has, the more likely she is to report use of a modern

contraceptive method. In each age group, over one-third of women with secondary or higher education, but far fewer women with no education, reported modern contraceptive use.

Comparing the two age groups, education seems to have a stronger effect on older women than on younger women. In 2006, for instance, 45% of sexually active married women age 25-34 who had attained secondary level and above were currently using modern contraceptive methods compared with 34% among women age 15-24. In 2011, however, this gap was much narrower (see Table 2).

In both surveys, modern contraceptive use is positively associated with level of household wealth. For both age groups, use of modern methods is highest among women from the richest households. Wealth-related disparities in contraceptive use are greater among younger women.

Regional variation in contraceptive use is great especially for the age group 15-24 years for both the period of 2006 and 2011. For instance, in 2006 9% of the young from the Northern region were using contraceptives compared to 29% from the Central region. This trend is also observed in 2011 where 15% of the young married, sexually active women were using contraceptives compared to 34% from the Central region. As expected, women in urban areas are also more likely to use contraception than women in rural areas. Urban-rural differentials are relatively larger among younger women compared with older women.

Women who wanted a child within two years reported the lowest levels of contraceptive use. Conversely, women who did not want any more children had the highest levels. Nevertheless, among women who did not want any more children, far fewer women age 15-24 reported current use of a contraceptive method compared with women age 24-35 (see Table 2).

Women's empowerment does not appear to be associated with contraceptive use, for either age group. In 2006, women age 15-24 with low or medium empowerment scores reported similar levels of contraceptive use, while women age 15-24 with a high empowerment score were generally somewhat less likely to use contraception (see Table 2). Also, higher levels of contraceptive use were observed among women who said they could refuse sex with their husbands compared with women who said they could not refuse sex.

Table 2. Proportion of married sexually active women currently using a modern method of contraception, by survey year and age group

	2006		2011	
Background characteristics	**15-24**	**25-34**	**15-24**	**25-34**
Education attainment				
No education	5.7	12.5	16.7	22.9
Primary	17.1	24.4	22.3	32.9
Secondary+	33.8	44.6	34.5	35.8
p-value	*0.0000*	*0.0000*	*0.0010*	*0.0000*
Wealth Index				
Lowest 40%	12.8	13.1	19.1	25.8
Middle 40%	13.0	25.8	24.8	36.1
Highest 20%	41.5	45.9	38.7	49.1
p-value	*0.0000*	*0.0000*	*0.0000*	*0.0000*
Administrative region				
Central	29.0	40.8	34.1	41.7
Eastern	20.8	21.9	23.0	32.9
Northern	9.4	12.7	14.8	31.3
Western	15.3	22.9	25.6	34.7
p-value	*0.000*	*0.000*	*0.022*	*0.060*
Residence				
Rural	14.2	22.2	21.8	33.1
Urban	41.9	44.9	40.3	47.0
p-value	*0.0000*	*0.0000*	*0.0000*	*0.0000*
Family planning messages				
Did not hear family planning message in past few months	13.7	18.9	23.2	25.1
Heard family planning message in past few months	22.4	29.5	26.2	39.3
p-value	*0.0009*	*0.0001*	*0.4047*	*0.0000*
Desire for children				
Wants within 2 years	12.2	13.4	15.2	19.2
Wants after 2 years	21.4	27.4	28.8	38.3
Don't want any more	28.4	37.5	33.9	50.8
p-value	*0.0033*	*0.0000*	*0.0000*	*0.0010*
Husband's education level				
No education	6.8	8.2	22.6	22.6
Primary	15.9	22.5	24.1	33.8
Secondary+	26.1	35.6	26.8	41.8
Don't know	15.5	27.3	35.4	35.8
p-value	*0.0001*	*0.0000*	*0.5375*	*0.0072*
Can refuse sex				
No	16.1	19.6	15.4	24.7
Yes	19.7	27.2	27.0	37.6
p-value	*0.2313*	*0.0171*	*0.0128*	*0.0005*

Cont'd..

Table 2. Cont'd

	2006		2011	
Background characteristics	**15-24**	**25-34**	**15-24**	**25-34**
Empowerment Index				
Low	19.5	21.4	24.8	34.2
Medium	19.7	26.3	28.2	37.7
High	15.4	27.0	22.9	35.1
p-value	*0.4217*	*0.2734*	*0.3952*	*0.5942*
Visited health facility in last 12 months				
No	12.8	21.8	26.1	35.5
Yes	21.0	26.8	25.3	36.0
p-value	*0.0045*	*0.0800*	*0.8251*	*0.8886*
Number of women (weighted)	1,144	1,658	1,076	1,738

Our study also carried out further analysis to find factors that might be associated with modern contraceptive use (outcome variables), regressed over a number of independent factors. Table 3 shows the details of the regression results. The regression analysis indicated that in 2006, after controlling for other covariates, contraceptive use among women age 15-24 is significantly associated with educational attainment, household wealth, urban-rural residence, and number of living children. Among women age 25-34, the significant variables are educational attainment, household wealth, and desire for children. In 2011, the significant variables for younger women were only residence and desire for children while for older women education attainment, household wealth, exposure to family planning message, desire for children, and perceived ability to refuse sex.

In 2006, educational attainment has a strong positive relationship with modern contraceptive use among both younger women and older women. For women age 15-24, the odds of using a modern method are 2.8 times higher for women with primary education and 3.5 times higher for women with secondary education compared with women with no education. The effect of education is slightly weaker for women age 25-34, reflected by smaller odds ratios. In contrast, education in 2011 was not significantly associated with contraceptive use, except for older women with secondary education.

In 2006, education and desire for children were positively associated with contraceptive use among women in both age groups. In 2011, the positive association remained only for the

two variables (education and desire for children) among women age 25-34. The odds of using contraception for women in the higher categories of education attainment are more than twice the odds for women with no education level. Similarly, the odds of using contraception for women who did not want any more children are more than twice the odds for women who wanted more children.

Results show that administrative region was a significant variable only for older age groups in 2006. Living in urban areas was associated with more contraceptive use among women age 15-24 in both 2006 and 2011. Desire to have children was significantly associated with contraceptive use for both younger and older women in 2011, and only for older women in 2006. Compared with women who want a child within next two years, the odds of using contraception are over five times higher for women who do not want any more children in both surveys. The odds ratio for women who want to delay childbearing ranges from 2.3 for women age 15-24 in 2011 to 2.9 for women age 25-34 in the same survey.

Recent exposure to family planning messages and perceived ability to refuse sex are only significantly associated with contraceptive use for older women in 2011. Analysis shows that women's empowerment show a significant relationship with contraceptive use among older married sexually active women by 2006 and 2011.

Overall, there were relatively few significant covariates in 2011 compared to 2006. For example, residence and desire for children were the only significant variables for women age 15-24 in 2011. Results from Hosmer-Lemeshow (1980) goodness of fit for 2006 were 0.410 for women age 15-24 and 0.682 for women age 25-34. Similarly, results using the 2011 data were 0.311 and 0.477, respectively. The null hypothesis under the goodness of fit is that the model is a good fit, implying that probabilities greater than 0.05 using the 95% level of confidence were taken to be a good fit. Therefore, despite the relatively small number of significant independent variables, the results suggest that the models are a good fit overall.

Table 3. Results from logistic regression for factors associated with use of contraception among sexually active married women, using UDHS 2006 and 2011 data

	2006				2011			
	15-24		25-34		15-24		25-34	
	OR	95% CI	OR	95% CI	OR	95% CI	OR	95% CI
Education level	(Reference=None)							
Primary	2.86**	1.29-6.36	1.70**	1.11-2.60	1.20	0.44-3.28	1.29	0.77-2.17
Secondary+	3.57**	1.35-9.47	2.28**	1.34-3.90	1.80	0.60-5.36	1.97**	1.02-3.80
Wealth Index	(Reference=Lowest40%)							
Middle 40%	0.74	0.45-1.22	1.57**	1.08-2.27	1.16	0.74-1.84	1.47**	1.08-2.00
Highest 20%	2.06	0.33-1.31	2.18**	1.32-3.61	1.38	0.72-2.64	2.20**	1.35-3.57
Administrative region	(Reference=Central)							
Eastern	1.42	0.61-2.04	0.63**	0.44-0.89	0.84	0.52-1.36	0.97	0.67-1.40
Northern	0.65	0.31-1.31	0.38**	0.24-0.62	0.62	0.32-1.22	1.29	0.83-2.01
Western	1.11	0.61-2.04	0.62**	0.43-0.89	1.01	0.62-1.65	1.07	0.75-1.52
Residence	(Reference=Rural)							
Urban	2.51**	1.46-4.31	1.41	0.94-2.12	1.76**	1.06-2.93	1.09	0.76-1.55
Heard family planning messages on radio/TV /newspaper	(Reference=No)							
Yes	1.35	0.90-2.04	1.20	0.88-1.64	0.99	0.67-1.47	1.39**	1.42-1.96
Desire for children	(Reference=Wants within 2 years)							
Wants after 2 year	1.58	0.97-2.56	2.46**	1.60-3.79	2.00**	1.34-3.89	2.86**	1.81-4.52
No more	2.55	0.87-6.63	4.97**	2.74-9.01	2.51	0.69-9.06	5.54**	2.84-10.83
Partners education	(Reference=No education)							
Primary	1.67	0.46-6.09	1.76	0.84-3.75	1.09	0.36-3.32	1.32	0.65-2.67
Secondary+	1.69	0.50-5.74	1.92	0.87-4.26	0.85	0.28-2.61	1.27	0.61-2.66
Don't know	0.60	0.11-3.12	1.36	0.49-3.90	1.51	0.39-5.83	1.05	0.47-2.35
Can refuse sex	(Reference=No)							
Yes	1.10	0.70-1.74	1.25	0.87-1.80	1.60	0.88-2.90	1.50**	1.05-2.15
Empowerment Index	(Reference=Low)							
Medium	0.85	0.54-1.32	1.41	0.96-2.05	1.21	0.76-1.92	1.21	0.76-1.92
High	0.69	0.54-1.32	1.56	1.00-2.42	0.93	0.58-1.52	0.93	0.58-1.52
Visited health facility in last 12 months	(Reference=No)							
Yes	1.38	0.88-2.16	1.17	0.84-1.64	0.81	0.55-1.20	0.90	0.66-1.22
Number of living children	1.36**	1.14-1.61	0.99	0.91-1.08	1.09	0.92-1.30	1.00	0.92-1.09
Number of women (weighted)	1,144		1,658		1,076		1,738	

** p<.05

DISCUSSION AND CONCLUSIONS

This study analyzed the socio-economic and demographic factors associated with contraceptive use in Uganda among young women (age 15-24) and older women (age 25-34) in 2006 and 2011 who were married, fecund, non-pregnant, and sexually active in the last year before the survey. There was a large disparity in modern contraceptive use between the two age groups in both years.

We ran separate regression models for each age group in each year. Results showed that more socio-economic and demographic factors were found to be associated with contraceptive use among older women compared to the younger ones. In 2006, contraceptive use among older women was uniquely associated with wealth, region, and empowerment. In 2011, exposure to family planning messages, ability to refuse sex and wealth index were significant unique factors associated with contraceptive use among older women.

Women's empowerment was thought to be an important predictor of contraceptive use but was found to be significant only among the older age group in 2006. Study results indicated that empowerment was not associated with contraceptive use among young married women.

Overall, the only consistently significant factor associated with contraceptive use after controlling for related factors in all four models was the desire for more children. This finding echoes that from, for example, a longitudinal study in Bangladesh which concluded that contraceptive use and desire for additional children are significant predictors of subsequent contraceptive use (Chowdhury and Phillips 1989). An earlier study in Pakistan revealed that women who had more children than their ideal number of children and who did not want any more children were four times more likely to have used contraceptives compared with women who had fewer children than their ideal and who wanted more children (Shah and Palmore 1979).

The findings suggest that improving the livelihood of the population is important. Family planning programs should be intensified to meet the needs of young and married women. Programs intended to improve contraceptive use among married women should consider increased outreach to younger married women who are less likely to use modern family planning

methods. Finally, making longer-term modern contraceptives, especially injections, available to more women would help reduce the level of unmet need for family planning in Uganda.

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APPENDIX: MULTICOLLINERALITY DIAGNOSTICS TEST

	2006		2011	
Variable	**VIF***	**R-Squared**	**VIF***	**R-Squared**
Education	1.52	0.3407	1.55	0.3560
Wealth Index	1.90	0.4724	2.03	0.5062
Administrative region	1.31	0.2341	1.23	0.1839
Residence (urban-rural)	1.51	0.3370	1.73	0.4224
Exposed to family planning messages from radio/TV/newspaper	1.12	0.1092	1.17	0.1424
Desire for children	1.25	0.1990	1.13	0.1188
Partner's education	2.63	0.6193	2.80	0.6427
Can a woman refuse sex	1.82	0.4500	2.21	0.5475
Empowerment Index	1.68	0.4035	1.92	0.4802
Visited health facility	1.19	0.1575	1.15	0.1313
Number of living children	1.72	0.4191	1.79	0.4427

*Variance inflation factor