



## RESEARCH ARTICLE

# Predictors of age at first child's birth and contraceptive use among men in Uganda [version 1; peer review: 1 approved with reservations, 1 not approved]

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## Abstract

**Background:** Globally, research on age at first child's birth among men has been neglected especially in Africa. Consequently, little is known about its impact on male involvement in reproductive health. This paper examined the socio-demographic, economic and proximate predictors of age at first child's birth among men aged 15-54 years in Uganda.





**Methods:** We used the 2016 Uganda Demographic and Health Survey (UDHS) on a sample of 3,206 men aged 15-54 years who had a biological child. The outcome variable was age at first childbirth categorized as: below 17, 18-24 and 25 years and above (25+). Analysis was done using descriptive statistics, un-adjusted and adjusted multinomial regressions with significance level at 95%.

**Results:** Median age at first child's birth was 22 years (IQR = 20-25). The majority of men (62.4%) had fatherhood onset between 18 and 24 years. Only 5.2% had fatherhood onset at 17 years or earlier, increasing to 32.4% at 25+. Respondents whose first sexual encounter was before 18 years was 44.3% and 92.7% by 24+. Few respondents (44.1%) reported use of any contraceptive methods. Anglican religion (RRR=1.62; CI 1.06 – 2.46) or not having attended school (RRR=2.20; CI 1.02-4.71) were predictors of childbirth onset before 17 years. Age of sex debut at 18 years or higher (RRR= 2.09, CI 1.72 – 2.54) and secondary and above education (RRR = 1.76, CI 1.42-2.18) were predictors of fatherhood onset at 25+. Contraceptive use among men had no association with age at first child's birth.

**Conclusion:** These findings are important for strategic allocation of resources to curb early onset of fatherhood among adolescent and young men under the age of 25 years. They highlight the need for gender-sensitive interventions targeting men for behavioral change, participation in Sexual and Reproductive Health Rights (SRHR) programming and improved access to services delivery.

## Open Peer Review

Approval Status  

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## Keywords

Teenage Fatherhood, First Child Birth, Male Involvement, Reproductive Health, Uganda

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## Abbreviations

DHS Demographic Health Survey

ICPD International Conference on Population and Development

IPV Intimate Partner Violence

IQR Interquartile Range

SRHR Sexual and Reproductive Health Rights

UBOS Uganda Bureau of Statistics

UDHS Uganda Demographic Health Survey

VIF Variance Inflation Factor

## Background

Globally, the role of men in reproductive health was highlighted during the the 1994 International Conference on Population and Development (ICPD) in Cairo as key in improving maternal and adolescent reproductive health indicators, especially in developing countries (Snow *et al.*, 2015). Unfortunately, studies conducted in the sub-Saharan African region to determine the predictors of age at first child's birth among men are uncommon in spite of advocacy efforts towards male involvement in reproductive health. Literature indicates that there is scarcity of evidence to demonstrate that men have been directly targeted by or are primary beneficiaries from reproductive health programs and activities (Sternberg & Hubley, 2004; Kabagenyi *et al.*, 2014a; Onyango *et al.*, 2010). As a consequence, male fertility in the sub-Sahara African region has remained high – two-fold times higher than female fertility (Ntozi, 1995; Schoumaker, 2017; Snow *et al.*, 2013). The high fertility in these regions could be attributed to the male dominance in sexual relationships and marriage, high desire for large families and polygamy, little or lack of couple discussion on childbearing and disapproval of contraceptive use among men (Berhane *et al.*, 2011; Kabagenyi *et al.*, 2014a; Ntozi, 1995; Schoumaker, 2017; Snow *et al.*, 2013). This paper provides an opportunity to profile the predictors of first child's birth among men aged 15–54 years in Uganda, with the aim of enhancing knowledge and contributing to an increase in the demand and utilization of reproductive health services among men.

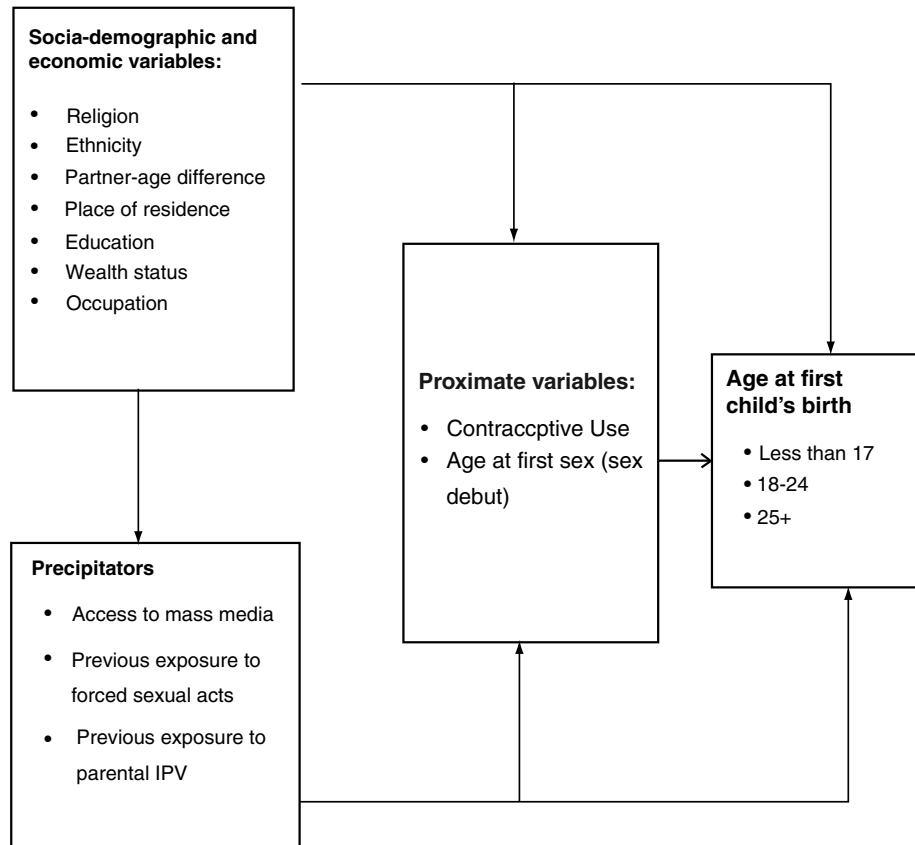
The literature on age at first child's birth and the associated predictors among men has remained scarce in most developing countries in spite of numerous studies on reproductive health issues and childbearing. Existing evidence shows that most studies on first childbirths and reproductive health matters focus on women rather than men (Kabagenyi *et al.*, 2014a; Macutkiewicz & MacBeth, 2017; Neal *et al.*, 2015). However, a few studies in the literature which focused on men show that age at first child's birth is not only an important predictor of fertility among men, but also it is central in influencing national and global trends of health indicators (Finer & Philbin, 2014; Martinez *et al.*, 2012). Early age at first childbirth among men increases the risks of suffering from depression, parenting difficulties, psychological conditions such as poor mental health during late adulthood and high mortality odds (Einiö *et al.*, 2015; Grundy & Foverskov, 2016; Grundy & Read, 2015; Grundy & Tomassini, 2006; Mirowsky & Ross, 2002).

Benefits have been associated to delaying the age at first birth among men, and they include: enabling men to complete and attain higher education, prepare for future prospects such as engaging in income generating ventures and pursue better employment or career development during adolescence and young adulthood; reducing the risk of undesired consequences that may arise from unwanted teenage pregnancies, abortions among sexual partners and those associated with teenage fatherhood (Darroch *et al.*, 2016; Kato-Wallace *et al.*, 2016). Lastly, delaying age at first birth among men improves chances for a future healthy start of fatherhood, ensures the smooth transition from adolescence to adulthood, improves the likelihood for better socio-economic status and lowers the risk of reporting adulthood chronic illnesses (Pudrovska & Carr, 2009). Past studies have also demonstrated that education has a strong negative influence on the first child's birth among men. The literature argues that aspirations for higher education attainment often delay entry into cohabitation, marital unions and fatherhood (Neels *et al.*, 2013).

In Uganda, studies on age at first child's birth among men are uncommon. The paper seeks to determine the socio-demographic, economic and proximate predictors of age at first child's birth among men aged 15–54 years in Uganda. Further, the paper sought to generate knowledge to guide strategic resource allocation for family planning and population development programs, with the aim to increase age at first child's birth. A customized conceptual framework tailored for this study is shown in Figure 1. In this study we propose that the socio-demographic, economic and precursor/precipitating variables indirectly work through the proximate factors (contraceptive use and age at first sex) to influence age at first child's birth among men as demonstrated in the conceptual framework.

Specifically, the study examined the relationship between contraceptive use, age at first sex, education, financial status, place of residence, occupation, ethnicity and age at first child's birth. In addition, the following hypotheses were examined: Men with secondary and higher education levels are more likely to have a higher age at first child's birth than those with no education. Men who experience sexual debut after age 25 years are likely to have a higher age at first child's birth than those with early sex debut defined as age less than 17 years. Men in rural areas have increased likelihood of having a lower age at first child's birth than those in urban areas. Men who use contraceptives are more likely to have a higher age at first child's birth than those who don't use. This study was conducted in Uganda which has one of the youngest population age structure in the world – half of the population are children below 18 years of age, with a high age dependency ratio (103%) (Uganda Bureau of Statistics (UBOS) Kampala, 2016). Uganda is a developing country in the sub-Saharan African region, specifically in East Africa with a diversity of ethnic groups and socio-cultural heritage.

The findings of this study are crucial in improving male participation in reproductive health by targeting men's behavior and social norm changes to limit teenage or early fatherhood, and to empower young couples to negotiate family planning decisions for improved contraceptive uptake freely. Second, the findings will enhance building the capacity of skills among healthcare



**Figure 1.** Conceptual framework of predictors of men's age at first child's birth.

providers in facilities to adequately engage and provide reproductive healthcare services to men. This strategy is anticipated to encourage men to take the lead as users, potential clients, and partners in accessing reproductive healthcare. Lastly, these findings will influence policymakers engaged in reproductive health programming to develop gender-sensitive policies that respond to the needs of the vulnerable young men, so that such men are targeted with efficient and effective interventions for improved male involvement and reproductive health services delivery.

## Methods

### Study design

This study was based on cross-sectional data to measure the effect of independent factors on age at first child's birth among men aged 15–54 years. This design was preferred because it facilitates examination of multiple exposures or independent variables at the same time.

### Data source

This paper is based on data from a nationally representative Uganda Demographic and Health Survey (UDHS) survey of 5,336 men that was conducted in 2016. The study included all men who had data on age at first child birth. Men who had missing data on age at first childbirth and those who had never had a biological child were excluded from the study. The study focused

on analyzing determinants of age at first child's birth among men aged 15–54 years who responded to the male questionnaire for the three-year demographic health survey period prior to 2016. In terms of geographical scope, the study considered all regions in the entire country. The data source was the Men's Recode (MR) file of 2016. More details about the sampling procedures and participant selection can be found in the main report (UBOS & Macro International, 2017). Monitoring and Evaluation to Assess and Use Results Demographic and Health Surveys (MEASURE DHS) provided authorization to use this data upon provision of a written request with the description of the intended study.

### Sample size

A total of 5,336 records were identified from the men's individual record (MR) dataset. A total of 3,206 records met the inclusion criteria of men aged 15–54 years and had a biological child were retrieved and considered for analysis, as shown in Figure 2.

### Study variables

The dependent variable for this study was the age at first child's birth, a variable reported and generated from the men's questionnaire. During the interview of male respondents and as shown in Figure 3 below, the question on number line 211 was asked: How old were you when your ("first" applies if a respondent

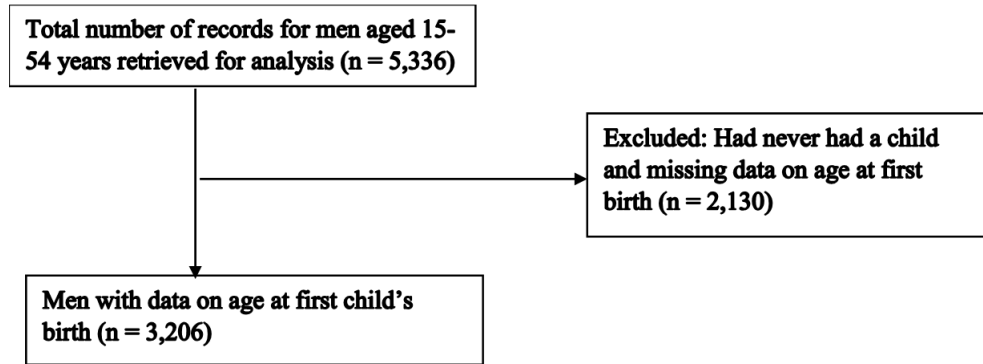


Figure 2. Derivation of the study sample used in the analysis.

206	Have you ever fathered a son or a daughter who was born alive but later died?  IF NO, PROBE: Any baby who cried, who made any movement, sound, or effort to breathe, or who showed any other signs of life even if for a very short time?	YES ..... 1 NO ..... 2 DON'T KNOW ..... 8	→ 208
207	a) How many boys have died? b) And how many girls have died?  IF NONE, RECORD '00'-	a) BOYS DEAD ..... <input type="text"/> b) GIRLS DEAD ..... <input type="text"/>	
208	SUM ANSWERS TO 203, 205, AND 207, AND ENTER TOTAL. IF NONE, RECORD '00'-	TOTAL CHILDREN .....	
209	CHECK 208:  HAS HAD MORE THAN ONE CHILD <input type="checkbox"/> HAS HAD ONLY ONE CHILD <input type="checkbox"/> HAS NOT HAD ANY CHILDREN <input type="checkbox"/>		→ 211 → 301
210	Did all of the children you have fathered have the same biological mother?	YES ..... 1 NO ..... 2	
211	CHECK 208:  HAS HAD MORE THAN ONE CHILD <input type="checkbox"/>   HAS HAD ONLY ONE CHILD <input type="checkbox"/> a) How old were you when your first child was born? b) How old were you when your child was born? AGE IN YEARS .....		
212	CHECK 203 AND 205:  AT LEAST ONE LIVING CHILD <input type="checkbox"/> NO LIVING CHILDREN <input type="checkbox"/>		→ 301

Figure 3. Measure Demographic and Health Survey (DHS) questions asked to men about the age at first childbirth.

has had already more than one child) child was born? The response to this question was recoded numerically in completed years of age.

The dependent variable data was retrieved as numerical data and recorded in completed years. This data was then categorized into three age groups as follows: “17 years and below” for all men who had their first child’s birth before the 18<sup>th</sup> birthday, “18 – 24 years” for all men who had their age at first child’s birth 18 to 24 years, and lastly “25+ years” for all men whose age at first child’s birth was after their 25<sup>th</sup> birthday and above.

The independent variables were grouped into categories as hypothesized to influence the dependent variable. Socio-demographic and economic variables included: religion, ethnicity, education, financial status, occupation, partner-age difference, place of residence, and mass media exposure (including internet use). One of the categories considered for the occupation variable was white-collar jobs, this was defined as occupations that are managerial, technical, clerical or sales based. Proximate variables included: contraceptive use and age at sex debut. Precipitating variables, including previous exposure to parental Intimate Partner Violence (IPV) and forced sex, were included to examine their influence on age at first birth.

### Data analysis

Data were weighted and analyzed at three levels: univariate, bivariate and multivariate. Univariate analysis was used to describe the characteristics of men, while unadjusted multinomial regression was performed at a bivariate level to establish the association between the independent variables and the age at first child’s birth. An adjusted multinomial regression model was used to examine the factors associated with age at first child’s birth, using the age group 18–24 years as the reference category. A p-value <0.05 was considered statistically significant at 95% confidence level. Centered and un-centered variance inflation factor (VIF) tests were used to test multicollinearity. The analysis was done using *Stata* software v15.0.

## Results

### Description of characteristics for the study population

**Table 1** presents the background characteristics and detailed description of the study participants. A weighted total of 3,154 men were analyzed at the univariate level. Mean age at first child’s birth was 23 years, median 22 (IQR=20–25 years). Minimum age at first child’s birth was 14 while the maximum was 50 years. The majority of the respondents were residing in rural areas (76.2%), while more than half (62.4%) aged between 18 and 24 years at the birth of their first child. Regarding education attainment, 94.4% had attained formal education at primary, secondary or higher level all combined, though 37.7% had exclusively attained secondary and higher education level only. The majority of men had access to mass media (91.3%) simultaneously through radio, newspapers, television, and the internet. Nearly half of the respondents were engaged in the agricultural sector (46.4%) as their primary occupation. Most participants affiliated themselves with the Munyankore ethnic group (20.0%), followed by Muganda (16.6%) and Itesot (16.2%). The most

**Table 1. Distribution of men by demographic and socioeconomic characteristics.**

Characteristics	Percentage (%)	n=3154
<b>Age at first child’s birth</b>		
≤17	5.2	165
18–24	62.4	1967
25+	32.4	1022
<b>Respondents age</b>		
15–19	0.6	18
20–24	10.5	330
25–29	17.6	553
30–34	21.3	671
35–39	14.8	468
40–44	16.0	505
45–49	1.0	315
50–54	9.3	293
<b>Place of residence</b>		
Urban	23.8	751
Rural	76.2	2402
<b>Education</b>		
No education	5.6	178
Primary	56.7	1786
Secondary+	37.7	1190
<b>Financial status</b>		
Poorest	18.3	578
Poorer	18.7	590
Middle	19.7	621
Richer	21.4	676
Richest	21.8	688
<b>Occupation</b>		
Not working	1.1	34
White-collar jobs	16.8	531
Agriculture	46.4	1463
Services/domestic	8.1	255
Manual labour	27.6	871
<b>Access to mass media</b>		
No	8.7	274
Yes	91.3	2880
<b>Ethnicity</b>		
Acholi	9.5	301
Alur	6.1	191
Bafumbira	6.2	195
Banyoro	5.3	165
Banyankore	20.0	619
Baganda	16.6	522
Bagisu	10.7	338
Iteso	16.2	511
Basoga	7.4	232
Sabinyi	2.6	80
<b>Religion</b>		
No religion and Traditional	1.2	38

Characteristics	Percentage (%)	n=3154
SDA and Orthodox	1.4	45
Pentecostal and small Christian sub-groups	9.3	295
Anglican	35.8	1128
Muslims	12.9	408
Catholics	39.3	1240
<b>Exposure to parental IPV</b>		
No	65.9	2079
Yes	34.1	1075
<b>Exposure to forced sexual acts</b>		
No	96.7	3048
Yes	3.3	106
<b>Age at sex debut</b>		
≤17	44.3	1396
18+	55.7	1758
<b>Current contraceptive use</b>		
No	55.9	1764
Yes	44.1	1390

SDA – Seventh Day Adventists, IPV – Intimate Partner Violence.

common reported religion was Catholic (39.3%) followed by Anglican (35.8%) and Islam (12.9%). Nearly half (44.3%) of the respondents had their sexual debut before 18 years. In total, 3.3% of participants had been exposed to forced sexual acts, while 34.1% had been exposed to parental intimate partner violence. Lastly, more than half of the respondents (55.9%) were not using any method of contraception.

#### Association between the independent factors and age at first child's birth among men

Table 2 presents the unadjusted multinomial results of the associations between the independent factors and the age at first child's birth. Education, place of residence, ethnicity, age at first sex (sex debut), financial status, religion and occupation were significantly associated with age at first child's birth ( $p < 0.05$ ).

Precipitating factors such as exposure to mass media, forced sexual acts and exposure to parental intimate partner violence were not significantly associated with age at first childbirth among the participants. Likewise, contraceptive use as a proximate factor was not significantly associated with age at first childbirth among men. All the variables that were significantly associated with age at first childbirth were included in the adjusted multivariate analysis models.

#### Factors associated with age at first child's birth among men at multivariate analysis

Adjusted multivariate analysis results (Table 3) showed that men with no education were 2.2 times (RRR=2.2; CI: 1.02 – 4.71) more likely to have first their child by 17 than between 18–24 years compared to those with primary education, other factors remaining constant. On the contrary, men with secondary or higher education were 0.4 times less likely to have their first child (RRR=0.44; CI:0.22-0.89) by the age of 17 than 18–24

compared to those with primary education, holding other factors constant. Men with secondary or higher education were 1.8 times (RRR=1.76; CI: 1.42-2.18) more likely to have their first child by the age of 25 and above than between 18–24 years compared to those with primary education, holding other factors constant. With regards to ones' ethnicity, Banyoro men were 0.5 times (RRR= 0.48; CI 0.30-0.78) less likely to have their first child by 25 and above than between 18–24 years compared to the Banyankore holding other factors constant. Similarly, among the Baganda men were 0.6 times (RRR=0.61; CI: 0.41-0.81) less likely to have their first child aged 25 and above than between 18–24 years compared to Banyankore holding other factors constant. Regarding religious affiliation, Anglican men were 1.6 times more likely to have their first child by 17 than between 18–24 (RRR=1.61; CI: 1.060 - 2.46) compared to Catholic men. Men were asked about their age at first sexual encounter, this variable was included in the analysis to examine its predictability to the age at which men had their first child. Table 3 shows men whose age at first sexual encounter was 18+ (18 years and above) were 0.1 times less likely (RRR: 0.06; CI:0.03 – 0.11) to have their first child by 17 than between 18–24 years compared to those who had their first sexual encounter when less than 17 years holding other factors constant. Men who had first sex aged 18 years and above were 2.1 times (RRR=2.09; CI 1.72 – 2.54) more likely to have their first child by 25 years and above than between 18–24 years compared to those who had their first sexual encounter when less than 17 years. VIF results for multicollinearity showed that age of a man was strongly correlated with other independent variables. As a consequence, it was excluded at multivariate analysis presented above. Table 4 shows the details of the VIF estimates. In spite of the mean VIF being greater than 1, there was no evidence of significantly detected multicollinearity among either within predictors themselves or any of the predictor with the constant term.

#### Discussion

Studies on predictors of age at first child's birth among men in Uganda are uncommon. This paper aimed at examining the socio-demographic, economic and proximate predictors of age at first child's birth among men aged 15–54 years in Uganda. This study showed that almost three-quarters of the men had their first child as youths, before 25 years. These results are comparable with findings from a study that evaluated trends and characteristics of age at first child's birth among adolescent girls and young women within the East African countries, which showed that Uganda was one of the countries with the highest proportion of first childbirth among adolescent girls before 20 years of age (Neal *et al.*, 2015). This result may suggest that the determinants of age at first child may be similar between genders. Prior to this research, little has been published focusing on males spite of a high prevalence of low age at first child's birth among both young men and women, this paper aimed to address this gap. This finding implies that interventions and policy reforms to curb early onset of childbearing among young people should target men younger than 25 years as well.

This study revealed that nearly all men survey had their sexual debut before 25. Both bivariate and multivariate analysis

**Table 2. Unadjusted multinomial results of age at first child's birth and independent variables among respondents.**

Variable	Age group: 14–17 years		Age group: 25+ years	
	Relative Risk Ratio	Confidence Interval	Relative Risk Ratio	Confidence Interval
<b>Place of Residence</b>				
Urban	0.799	0.529 – 1.206	<b>0.613***</b>	1.360 – 1.913
Rural <sup>^</sup>	1.000			
Constant	<b>0.087***</b>	0.073 – 0.104	<b>0.460***</b>	0.421 – 0.502
<b>Education</b>				
No education	<b>1.906**</b>	1.149 – 3.160	1.187	0.836 – 1.686
Primary <sup>^</sup>	1.000			
Secondary+	<b>0.392***</b>	0.254 – 0.606	<b>2.027***</b>	1.733 – 2.370
Constant	<b>0.099***</b>	0.082 – 0.119	<b>0.384***</b>	0.345 – 0.427
<b>Ethnicity</b>				
Acholi	1.109	0.619 – 1.989	<b>0.741**</b>	0.551 – 0.997
Alur	0.713	0.319 – 1.596	0.861	0.612 – 1.212
Bafumbira	1.425	0.752 – 2.699	0.855	0.606 – 1.207
Banyoro	1.252	0.646 – 2.427	<b>0.463***</b>	0.308 – 0.696
Banyankore <sup>^</sup>	1.000			
Baganda	<b>0.394**</b>	0.203 – 0.765	<b>0.748**</b>	0.584 – 0.956
Bagisu	0.689	0.363 – 1.306	<b>0.687**</b>	0.516 – 0.914
Iteso	1.160	0.700 – 1.922	0.891	0.696 – 1.141
Basoga	0.933	0.479 – 1.817	<b>0.711**</b>	0.513 – 0.986
Sabinyi	0.830	0.293 – 2.350	<b>0.574**</b>	0.339 – 0.972
Constant	<b>0.092***</b>	0.647 – 0.132	<b>0.652***</b>	0.553 – 0.769
<b>Financial status</b>				
Poorest	1.000			
Poorer	0.966	0.606 – 1.537	0.926	0.715 – 1.200
Middle	1.016	0.640 – 1.613	1.184	0.922 – 1.520
Richer	0.631	0.382 – 1.041	1.072	0.839 – 1.371
Richest	0.546**	0.313 – 0.951	<b>1.967***</b>	1.552 – 2.493
Constant	0.101***	0.072 – 0.141	<b>0.427***</b>	0.356 – 0.513
<b>Occupation</b>				
Not working	2.114	0.675 – 6.627	1.451	0.700 – 3.008
White-collar jobs	<b>0.367**</b>	0.187 – 0.724	1.918***	1.563 – 2.354
Agriculture <sup>^</sup>	1.000			
Services/domestic	1.455	0.881 – 2.402	1.098	0.819 – 1.471
Manual labour	0.822	0.564 – 1.197	1.012	0.842 – 1.217
Constant	<b>0.093***</b>	0.074 – 0.115	<b>0.453***</b>	0.405 – 0.508
<b>Religion</b>				
No religion and Traditional	0.364	0.038 – 3.450	0.520	0.232 – 1.165
SDA & Orthodox	1.115	0.253 – 4.913	1.638	0.890 – 3.016
Pentecostal and other small Christian sub-groups	1.383	0.795 – 2.405	1.154	0.879 – 1.516
Anglican	1.383	0.961 – 1.993	<b>1.219**</b>	1.025 – 1.449

Variable	Age group: 14–17 years		Age group: 25+ years	
	Relative Risk Ratio	Confidence Interval	Relative Risk Ratio	Confidence Interval
Muslims	1.108	0.661 – 1.856	0.981	0.769 – 1.253
Catholics <sup>^</sup>	1.000			
Constant	<b>0.071***</b>	0.055 – 0.093	<b>0.478***</b>	0.423 – 0.539
<b>Age at first sex</b>				
≤ 17	1.000			
18+	<b>0.060***</b>	0.032 – 0.114	<b>2.189***</b>	1.866 – 2.568
Constant	<b>0.164***</b>	0.139 – 0.195	<b>0.320***</b>	0.282 – 0.364
<b>Access to mass media</b>				
No <sup>^</sup>	1.000			
Yes	0.989	0.569 – 1.719	1.063	0.812 – 1.390
Constant	<b>0.085***</b>	0.050 – 0.143	<b>0.491***</b>	0.380 – 0.635
<b>Exposure to Parental IPV</b>				
No <sup>^</sup>	1.000			
Yes	1.162	0.837 – 1.612	1.080	0.923 – 1.265
Constant	<b>0.079***</b>	0.065 – 0.097	<b>0.506***</b>	0.461 – 0.555
<b>Exposure to forced sexual acts</b>				
No <sup>^</sup>	1.000			
Yes	0.509	0.156 – 1.669	1.085	0.722 – 1.630
Constant	<b>0.085***</b>	0.073 – 0.100	<b>0.518***</b>	0.480 – 0.559
<b>Contraceptives Use</b>				
No <sup>^</sup>	1.000			
Yes	1.102	0.804 – 1.512	0.915	0.786 – 1.064
Constant	<b>0.080***</b>	0.065 – 0.010	<b>0.540***</b>	0.489 – 0.596

Reference Category, Observations: 3,206; \*\*\* p<0.01, \*\* p<0.05, \* p<0.1  
SDA – Seventh Day Adventists, IPV – Intimate Partner Violence

**Table 3.** Adjusted multinomial regression results of predictors of age at first child's birth among men aged 15–54 years, using the age group 18–24 years as the base category.

Variable	Age group: 14–17 years		Age group: 25+ years	
	Relative Risk Ratio	Confidence Interval	Relative Risk Ratio	Confidence Interval
<b>Place of Residence</b>				
Urban	1.355	0.815 - 2.252	1.282*	0.960 - 1.710
Rural <sup>^</sup>	1.000			
<b>Education</b>				
No education	<b>2.196**</b>	1.024 - 4.708	1.207	0.777 - 1.875
Primary <sup>^</sup>	1.000			
Secondary+	<b>0.439**</b>	0.218 - 0.886	<b>1.757***</b>	1.415 - 2.182
<b>Ethnicity</b>				
Acholi	1.269	0.560 - 2.877	0.789	0.550 - 1.132
Alur	0.631	0.207 - 1.922	1.092	0.757 - 1.575
Bafumbira	1.152	0.456 - 2.913	1.014	0.656 - 1.567
Banyoro	0.985	0.423 - 2.290	<b>0.481***</b>	0.295 - 0.784
Banyankore <sup>^</sup>	1.000			

Variable	Age group: 14–17 years		Age group: 25+ years	
	Relative Risk Ratio	Confidence Interval	Relative Risk Ratio	Confidence Interval
Baganda	0.422*	0.151 - 1.175	<b>0.605**</b>	0.411 - 0.891
Bagisu	0.510	0.204 - 1.275	0.744	0.521 - 1.063
Iteso	1.322	0.591 - 2.957	0.916	0.685 - 1.225
Basoga	0.807	0.229 - 2.843	0.716	0.448 - 1.144
Sabinyi	0.644	0.128 - 3.232	0.619*	0.360 - 1.065
<b>Financial status</b>				
Poorest <sup>^</sup>	1.000			
Poorer	1.131	0.689 - 1.857	0.892	0.659 - 1.208
Middle	1.241	0.658 - 2.339	1.120	0.780 - 1.609
Richer	0.954	0.491 - 1.854	0.915	0.661 - 1.265
Richest	0.920	0.401 - 2.111	1.416*	0.945 - 2.122
<b>Occupation</b>				
Not working	3.273*	0.995 - 10.774	1.420	0.677 - 2.977
White-collar jobs	0.590	0.227 - 1.534	1.179	0.878 - 1.583
Agriculture <sup>^</sup>	1.000			
Services/domestic	1.545	0.839 - 2.844	0.877	0.572 - 1.344
Manual labour	0.925	0.560 - 1.528	0.888	0.702 - 1.124
<b>Religion</b>				
No religion and Traditional	0.204	0.025 - 1.662	0.586	0.243 - 1.413
SDA & Orthodox	1.945	0.624 - 6.064	1.148	0.522 - 2.525
Pentecostal and other small Christian sub-groups	1.765*	0.916 - 3.401	1.040	0.711 - 1.522
Anglican	<b>1.613**</b>	1.060 - 2.455	1.160	0.948 - 1.419
Muslims	1.705	0.763 - 3.809	0.976	0.693 - 1.377
Catholics <sup>^</sup>	1.000			
<b>Age at first sex</b>				
≤ 17	1.000			
18+	<b>0.055***</b>	0.028 - 0.107	<b>2.089***</b>	1.717 - 2.541
Constant	<b>0.147***</b>	0.065 - 0.335	<b>0.271***</b>	0.190 - 0.387

<sup>^</sup> Reference Category, Observations: 3,206; \*\*\* p<0.01, \*\* p<0.05, \* p<0.

SDA – Seventh Day Adventists

**Table 4. Results of the Variance Inflation Factor (VIF) estimates of the independent variables in the model.**

Variable	Centered VIF		Uncentered VIF	
	VIF	1/VIF	VIF	1/VIF
<b>Place of residence</b>				
Urban	1.5	0.67	1.97	0.51
<b>Ethnicity</b>				
Acholi	1.55	0.64	1.71	0.58
Alur	1.35	0.74	1.43	0.70
Bafumbira	1.26	0.79	1.35	0.74
Banyoro	1.22	0.82	1.29	0.77
Baganda	1.73	0.58	2.07	0.48

Variable	Centered VIF		Uncentered VIF	
	VIF	1/VIF	VIF	1/VIF
Bagisu	1.46	0.68	1.64	0.61
Iteso	1.72	0.58	2.05	0.49
Basoga	1.40	0.71	1.51	0.66
Sabinyi	1.19	0.84	1.23	0.82
<b>Education</b>				
No education	1.10	0.91	1.17	0.86
Secondary+	1.34	0.75	2.15	0.47
<b>Financial status</b>				
Poorer	1.75	0.57	2.16	0.46
Middle	1.99	0.50	2.48	0.40
Richer	2.21	0.45	2.82	0.35
Richest	3.13	0.32	4.00	0.25
<b>Occupation</b>				
Not working	1.05	0.95	1.06	0.94
White-collar jobs	1.56	0.64	1.88	0.53
Services/domestic	1.15	0.87	1.26	0.80
Manual labour	1.38	0.73	1.90	0.53
<b>Religion</b>				
No religion and traditional	1.03	0.97	1.03	0.97
SDA and Orthodox	1.06	0.94	1.07	0.93
Pentecostal and other small Christian sub-groups	1.17	0.86	1.29	0.78
Anglican	1.34	0.75	2.08	0.48
Muslims	1.32	0.76	1.51	0.66
Hindu and others	1.04	0.96	1.05	0.95
<b>Age at first sex</b>				
18+	1.10	0.91	2.14	0.47
Intercept			16.38	0.06
<b>Mean VIF</b>	<b>1.44</b>		<b>2.24</b>	

SDA – Seventh Day Adventists.

showed that age at first sex was a proximate predictor of age at first child's birth. This finding is in agreement with another comparative study conducted among the sub-Saharan African countries where more than half of the adolescent men had sexual debut before 25 (Johnson & Gu, 2009). In many African societies behavioral maladjustment disorders, peer perceptions, negative sociocultural sex initiation values and poor parenting are direct determinants of early sex debut among adolescents (Babalola, 2004; Peltzer, 2010). This implies that interventions to ensure safer sexual behaviors have to be implemented and should aim at ensuring universal access to information about the benefits of safer practices and available contraception commodities to decrease the risk of first child's birth among adolescent men.

This study found no association between exposure to forced sexual acts, parental IPV and age at first child's birth among men. The findings indicated that fewer men were exposed to

forced sexual acts while a third had been exposed to parental IPV. One reason for not finding a significant association could be due to the fact that there was a low sample size of men who are victims of IPV. An earlier study had shown that men who are victims of IPV experience mild-severe consequences but unfortunately, the practice remains ignored in society and as a result, the prevalence and associations of such harmful abuse largely remain undocumented (Hines & Douglas, 2009). The study had hypothesized that men with a history of exposure to parental IPV or forced into sexual acts, especially when they were still young, had a higher risk of being involved in casual sex and early marriages which increases the likelihood for early first child's birth. The study results, however, were not in agreement with this hypothesis.

Contraceptive use was not found to be a predictor of age at first child's birth among men. Though contraceptive use is a proximate

determinant of childbirth, it is argued in the literature that willingness for contraception uptake increases mainly after the first child's birth and with subsequent births, especially among young couples for the purposes of child spacing and limiting. Studies in Rwanda and India demonstrated that the propensity for a couple without a child to demand contraception use is often significantly reduced (Jayaraman *et al.*, 2009; Rao & Mathada, 2016). Similar to another study conducted while comparing developing countries, it indicated that less than half of married and unmarried sexually active men used any form of contraceptives (Johnson & Gu, 2009). This evidence highly suggests that the low uptake of contraceptives among men is partly the explanation for this result. There are several factors documented in the literature that may explain low contraceptive use levels among men. These include: a high prevalence of negative socio-cultural expectations and values attached to childbirth behavior and practices, misconceptions and fears about modern contraceptives, overreliance on traditional contraceptive methods, prevalence of negative gender attitudes, limited opportunity for male discussion of family planning with health workers, and limited awareness about the role of men in fertility control to mention but a few (Kabagenyi *et al.*, 2014a; Kabagenyi *et al.*, 2014b; Kabagenyi *et al.*, 2016; Johnson & Gu, 2009; MacQuarrie *et al.*, 2015). Thus, the current relationship of contraceptive use and age at first child's birth in this study may likely be a result of a conflict between the influences of factors that are negatively associated with contraceptive use and its low uptake among men.

The study also showed that education was a positive predictor of late age at first child's birth. Previous studies conducted in the African region have consistently indicated that lack of or low education is a strong predictor of onset of teenage childbearing, especially among girls (Neal *et al.*, 2015; Peltzer, 2010). This study has also shown similar results among men. Secondary and higher education reduce risks for not working, reverse negative sociocultural values and norms, and other negative attitudes which are associated with early sexual debut and low contraceptive use among men (Johnson & Gu, 2009). Thus, secondary and post-secondary education improves contraceptive use and creates employment opportunities which result in delayed onset of fatherhood. This finding is consistent with the study hypothesis that men with secondary and higher education levels are more likely to have a higher age at first child's birth than those with no education. This result implies that any interventions and programs that are aimed at curbing teenage fatherhood should prioritize second chance formal education at primary and secondary levels, address barriers of access to universal secondary education and also promote incentives for post-secondary and higher education completion among men.

Ethnicity was found to be a predictor of age at first child's birth both at the bivariate and multivariate analysis levels. Possibly, cultural values, diversity in norms, and variations in the understanding of sexual roles and childbearing rewards explain the relationship between ethnicity and age at first child's birth, as

these are influenced by socio-economic factors. This finding was consistent with results from studies performed among women (Hirschman & Rindfuss, 1980; Matthews & Hamilton, 2009). However, the determinants for this relationship need to be further studied among men.

Religious affiliation, specifically Anglican denomination was found to be a significant predictor of early onset of fatherhood among the respondents. The relationship between religious affiliations and age at first childbirth has been observed among women in other countries such as Nigeria and Bangladesh (Fagbamigbe & Idemudia, 2016; Sarkar, 2010). However, this relationship among men has not been fully explored and this result provides a basis for further understanding of such dynamics in a Ugandan context. There is a need for more explorative research to study this phenomenological finding.

### Study limitations

There were two major limitations to this study. First due to the inherent cross-sectional design weaknesses, such as the inability to establish causal pathways and temporal associations between predictors and the age of first child's birth among men. The second limitation was related to the source of data which was the Demographic Health Survey, and specifically the inability to study the exhaustive list of predictors to age at first childbirth among men. The list of predictors may not have been exhausted by this study due to the fact that DHS data is standard and hence the possibility that some other predictors were missed in the data collection and analysis was unavoidable.

### Conclusion

This paper brings to light important predictors of age at first child's birth among men in Uganda. The onset of the first child's birth commonly occurs among young men below the age of 25 years, which may predispose them to increased risks of poor health and human development outcomes during adulthood and older-age. Indirect factors such as education, religion, and ethnicity were strongly associated with age at first child's birth among men. In addition, age at sex debut was the only direct predictor of age at first child's birth among men. For policy considerations, reversing secondary and higher-level school/tertiary education drop-out rates among men should be a priority. Universal access to SRHR services (including family planning) and behavioral change and communication messages to address early onset of fatherhood among sexually active young men should be enhanced. Actively engaging men at all levels including the use of cultural and religious institutions in promoting male involvement, through which men are encouraged to take lead in SRHR programming and services delivery should also be strengthened. Lastly, legal efforts and community engagement programs aiming to reduce teenagers' fatherhood practices should be intensified. For instance, increasing the legal age of marriage among men, preferably to be higher than 18 years which is currently considered to be the cutoff age for minors. These interventions will help in reducing teenage and adolescent first childbirths and associated negative outcomes among men in Uganda. Future research may further explore

other possible predictors of age at first child's birth, causal relationships, and differentials among men.

### Ethical considerations

Permission to use the male file dataset was provided by and accessed online from the MEASURE DHS website after providing a brief description of our study. Further details about approval and access to DHS data can be found from [DHS website](#).

### Data availability

#### Source data

The 2016 Ugandan Demographic and Health Survey (UDHS) data used in this study is available from the [DHS website](#):

[https://dhsprogram.com/data/dataset/Uganda\\_Standard-DHS\\_2016.cfm?flag=0](https://dhsprogram.com/data/dataset/Uganda_Standard-DHS_2016.cfm?flag=0) under the 'Male Recode' subsection.

Data can be accessed by applying through the DHS website. Please see their [data access help page](#) for information.

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## References

- Babalola S: **Perceived Peer Behavior and the Timing of Sexual Debut in Rwanda: A Survival Analysis of Youth Data.** *J Youth Adolesc.* 2004; **33**(4): 353–363.  
[Publisher Full Text](#)
- Berhane A, Biadgilign S, Amberbir A, *et al.*: **Men's knowledge and spousal communication about modern family planning methods in Ethiopia.** *Afr J Reprod Health.* 2011; **15**(4): 24–32.  
[PubMed Abstract](#)
- Darroch JE, Woog V, Bankole A, *et al.*: **Adding It Up: Costs and Benefits of Meeting the Contraceptive Needs of Adolescents.** New York. 2016.  
[Reference Source](#)
- Einiö E, Nisén J, Martikainen P: **Is young fatherhood causally related to midlife mortality? A sibling fixed-effect study in Finland.** *J Epidemiol Community Health.* 2015; **69**(11): 1077–1082.  
[PubMed Abstract](#) | [Publisher Full Text](#)
- Fagbamigbe AF, Idemudia ES: **Survival analysis and prognostic factors of timing of first childbirth among women in Nigeria.** *BMC Pregnancy Childbirth.* 2016; **16**(1): 102.  
[PubMed Abstract](#) | [Publisher Full Text](#) | [Free Full Text](#)
- Finer LB, Philbin JM: **Trends in ages at key reproductive transitions in the United States, 1951-2010.** *Womens Health Issues.* 2014; **24**(3): e271–e279.  
[PubMed Abstract](#) | [Publisher Full Text](#) | [Free Full Text](#)
- Grundy E, Foverskov E: **Age at First Birth and Later Life Health in Western and Eastern Europe.** *Popul Dev Rev.* 2016; **42**(2): 245–269.  
[Publisher Full Text](#)
- Grundy E, Read S: **Pathways from fertility history to later life health: results from analyses of the English Longitudinal Study of Ageing.** *Demogr Res.* 2015; **32**(4): 107–146.  
[Publisher Full Text](#)
- Grundy E, Tomassini C: **Fatherhood history and later life health and mortality in England and Wales: A record linkage study.** *Soc Biol.* 2006; **53**(3–4): 189–205.  
[Publisher Full Text](#)
- Hines DA, Douglas EM: **Women's Use of Intimate Partner Violence against Men: Prevalence, Implications, and Consequences.** *J Aggress Maltreat Trauma.* 2009; **18**(6): 572–586.  
[Publisher Full Text](#)
- Hirschman C, Rindfuss R: **Social, cultural, and economic determinants of age at birth of first child in Peninsular Malaysia.** *Popul Stud (Camb).* 1980; **34**(3): 507–518.  
[PubMed Abstract](#) | [Publisher Full Text](#)
- Jayaraman A, Gebreselassie T, Chandrasekhar S: **Effect of Conflict on Age at Marriage and Age at First Birth in Rwanda.** *Popul Res Policy Rev.* 2009; **28**(5): 551.  
[Publisher Full Text](#)
- Johnson K, Gu Y: **Men's Reproductive Health: Findings from Demographic and Health Surveys, 1995-2004.** DHS Comparative Reports No.17. Calverton Maryland, USA: ICF Macro. 2009.  
[Reference Source](#)
- Kabagenyi A, Jennings L, Reid A, *et al.*: **Barriers to male involvement in contraceptive uptake and reproductive health services: a qualitative study of men and women's perceptions in two rural districts in Uganda.** *Reprod Health.* 2014a; **11**(1): 21.  
[PubMed Abstract](#) | [Publisher Full Text](#) | [Free Full Text](#)
- Kabagenyi A, Ndugga P, Wandera OS, *et al.*: **Modern contraceptive use among sexually active men in Uganda: does discussion with a health worker matter?** *BMC Public Health.* 2014b; **14**: 286.  
[PubMed Abstract](#) | [Publisher Full Text](#) | [Free Full Text](#)
- Kabagenyi A, Reid A, Ntozi J, *et al.*: **Socio-cultural inhibitors to use of modern contraceptive techniques in rural Uganda: a qualitative study.** *Pan Afr Med J.* 2016; **25**: 78.  
[PubMed Abstract](#) | [Publisher Full Text](#) | [Free Full Text](#)
- Kato-Wallace J, Barker G, Sharafi L, *et al.*: **Adolescent boys and young men: engaging them as supporters of gender equality and health and understanding their vulnerabilities.** 2016.  
[Reference Source](#)
- MacQuarrie KL, Edmeades J, Steinhaus M, *et al.*: **Men and contraception: Trends in attitudes and use.** DHS Analytical Studies No. 49. Rockville Maryland, USA: ICF International. 2015.  
[Reference Source](#)
- Macutkiewicz J, MacBeth A: **Intended Adolescent Pregnancy: A Systematic Review of Qualitative Studies.** *Adolesc Res Rev.* 2017; **2**(2): 113–129.  
[Publisher Full Text](#)
- Martinez G, Daniels K, Chandra A: **Fertility of men and women aged 15-44 years in the United States: National Survey of Family Growth, 2006-2010.** *Natl Health Stat Report.* 2012; **5**(1): 1–28.  
[PubMed Abstract](#)
- Matthews TJ, Hamilton BE: **Delayed childbearing: more women are having their first child later in life.** *NCHS Data Brief.* 2009; **2**(1): 1–8.  
[PubMed Abstract](#)
- Mirowsky J, Ross CE: **Depression, parenthood, and age at first birth.** *Soc Sci Med.* 2002; **54**(8): 1281–1298.  
[PubMed Abstract](#) | [Publisher Full Text](#)
- Neal SE, Chandra-Mouli V, Chou D: **Adolescent first births in East Africa: disaggregating characteristics, trends and determinants.** *Reprod Health.* 2015; **12**(1): 13.  
[PubMed Abstract](#) | [Publisher Full Text](#) | [Free Full Text](#)
- Neels K, Theunynck Z, Wood, J: **Economic recession and first births in Europe: recession-induced postponement and recuperation of fertility in 14 European countries between 1970 and 2005.** *Int J Public Health.* 2013; **58**(1): 43–55.  
[PubMed Abstract](#) | [Publisher Full Text](#)
- Ntozi JPM: **Men's Fertility.** In: *High Fertility in Rural Uganda: The Role of Socioeconomic and Biological Factors.* Kampala, Uganda: Fountain Publisher. 1995; 45–47.
- Onyango MA, Owoko S, Oguttu M: **Factors that influence male involvement in sexual and reproductive health in western Kenya: a qualitative study.** *Afr J Reprod Health.* 2010; **14**(4 Spec no): 32–42.  
[PubMed Abstract](#)
- Peltzer K: **Early sexual debut and associated factors among in-school adolescents in eight African countries.** *Acta Paediatr.* 2010; **99**(8): 1242–1247.  
[PubMed Abstract](#) | [Publisher Full Text](#)
- Pudrovska T, Carr D: **Age at first birth and fathers' subsequent health: evidence from sibling and twin models.** *Am J Mens Health.* 2009; **3**(2): 104–115.  
[PubMed Abstract](#) | [Publisher Full Text](#) | [Free Full Text](#)
- Rao BS, Mathada VC: **Awareness and Determinants of Contraceptive use among Nursing Mothers in Bellary, Karnataka.** *J Clin Diagn Res.* 2016; **10**(1): QC15–QC19.  
[PubMed Abstract](#) | [Publisher Full Text](#) | [Free Full Text](#)

Sarkar P: **Determinants of age at first birth in Bangladesh.** *J Mod Math Stat.* 2010; **4**: 1–6.

[Publisher Full Text](#)

Schoumaker B: **Measuring male fertility rates in developing countries with demographic and health Surveys: An assessment of three methods.** *Demogr Res.* 2017; **36**(1): 803–850.

[Publisher Full Text](#)

Snow RC, Laski L, Mutumba M: **Sexual and reproductive health: progress and outstanding needs.** *Glob Public Health.* 2015; **10**(2): 149–173.

[PubMed Abstract](#) | [Publisher Full Text](#) | [Free Full Text](#)

Snow RC, Winter RA, Harlow SD: **Gender attitudes and fertility aspirations among young men in five high fertility East African countries.** *Stud Fam Plann.*

2013; **44**(1): 1–24.

[PubMed Abstract](#) | [Publisher Full Text](#)

Sternberg P, Hubley J: **Evaluating men's involvement as a strategy in sexual and reproductive health promotion.** *Health Promot Int.* 2004; **19**(3): 389–396.

[PubMed Abstract](#) | [Publisher Full Text](#)

Uganda Bureau of Statistics (UBOS) Kampala: **National Population and Housing Census 2014: Main Report.** Kampala, Uganda. 2016.

[Reference Source](#)

Uganda Bureau Of Statistics (Ubos), Icf International Inc.: **Uganda Demographic And Health Survey 2016.** In. Kampala, Uganda: Ubos And Calverton, Maryland: Icf International Inc.: Uganda Bureau Of Statistics & Macro International, 2017.

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## Open Peer Review

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### Version 1

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 **Lisa S. Dulli** 

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Thank you for allowing me to review this manuscript. The topic is certainly one that has not received much attention in the literature. I fully agree with the authors that the role of men and male engagement in sexual and reproductive health is important and requires more exploration.

I have a number of concerns with the current manuscript. First, concerning the background section:

1. The authors present a number of related works in their introduction; however, even after reading the manuscript, I still don't understand what drove them to research this topic. There is no clear problem statement, other than it is something others have not examined. What is the rationale? Where is the "so what" factor? Why should we care? This isn't to argue we should not care, but the authors should revise this section to build a logical and scientific case for why it is important and relevant to examine this topic.
2. In the background, there is mention of a few studies that have identified adverse outcomes associated with early parenthood for men (this may be where your problem statement lies, but it needs to be more explicit). However, all the cited studies were conducted in high-income countries, where the social norms around men's roles, parenthood and age, and other relevant factors, likely differ from the study's setting. What implications do these differences have to this work?
3. With regard to the conceptual framework, such models should be rooted in theory and/or evidence. The authors need to more clearly explain the underlying reasoning behind the conceptual framework and why the variables they selected were included. Also (spilling over into methods), the model suggests that a number of variables have both a direct and indirect effect on the outcome, and treat proximate variables and precipitators as potential mediators, but the analyses don't address these relationships in any way.

I also have a number of important concerns with regard to the methods section:

1. In the paragraph that describes the study design, it is important to note that the data used for these analyses come from a cross-sectional survey. As such, one can examine the existence, strength and direction of association, but causality cannot be determined. As such, removing the reference to “effect” would be appropriate. Rather, the authors should note they are examining associations.
2. It’s unclear why the authors chose to treat age at first child’s birth as a categorical variable, rather than continuous. This requires explanation.
3. These data are derived from a study that used a complex sampling design. The authors note they employed the sampling weights recommended by DHS, but make no mention of how the sampling design was addressed in the analyses. Detail is needed on how this was done, and if it wasn’t, it should be.
4. More information is needed on the variables in the conceptual model. How was the variable financial status created? Does the variable “contraceptive use” mean current use, past use, either or both? Also, some (albeit a small number) of participants were too young to have achieved some of your categories of your “independent” variables. For example, boys aged 15-19 are of secondary school age, so they likely could not have completed secondary school or higher. They also would be less likely to be employed, and if they were, not in “white collar” jobs than others, by the fact that they are younger. What impact, if any, might this have on your findings?
5. The test used for these analyses should be referred to as multinomial *logistic* regression, not multinomial regression. It’s also not clear why multinomial logistic regression was chosen for bivariate analyses. More detail is needed in the methods section.
6. Why do the authors choose to present relative risk ratio estimates rather than odds ratios, which would be more appropriate for these cross-sectional data? Also, it is not necessary to present estimates for the model intercepts (“constants”) in tables.
7. In tables 2 and 3, why is 18-24 the referent group? Please provide a rationale.
8. In the paragraph immediately following the title “Association between the independent factors and age at first child’s birth among men,” the authors state “Education, place of residence, ethnicity, age at first sex (sex debut), financial status, religion and occupation were significantly associated with age at first child’s birth ( $p < 0.05$ ),” but that isn’t shown in Table 2. The associations are far more complex than the authors note. Treating their proposed dependent variable as continuous would greatly simplify interpretation.

It’s really impossible to comment on the discussion section until the background, methods and results sections are revised.

**Is the work clearly and accurately presented and does it cite the current literature?**

Partly

**Is the study design appropriate and is the work technically sound?**

Partly

**Are sufficient details of methods and analysis provided to allow replication by others?**

No

**If applicable, is the statistical analysis and its interpretation appropriate?**

No

**Are all the source data underlying the results available to ensure full reproducibility?**

Yes

**Are the conclusions drawn adequately supported by the results?**

No

**Competing Interests:** No competing interests were disclosed.

**Reviewer Expertise:** My areas of expertise lie in health services research on the topics of sexual and reproductive health, and infectious disease, including research design and quantitative methods.

**I confirm that I have read this submission and believe that I have an appropriate level of expertise to state that I do not consider it to be of an acceptable scientific standard, for reasons outlined above.**

Reviewer Report 20 August 2019

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**Laura Hoemeke** 

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**General comments:** Please check spelling and grammar; there are a few typos in the article.

**For full approval:** Please note that one of the key hypotheses, use of contraception by males, was not proven to be true. This calls into question proposed interventions and implications of findings. Further discussion of why this might be true would significantly increase the utility of this study.

This paper examined the socio-demographic, economic and proximate predictors of age at first child's birth among men aged 15-54 years in Uganda. This study on the age of males (fathers) at the birth of their first biological child in Uganda contributes to the body of literature on the impact

of age at male/father's first birth on male involvement/engagement in reproductive health. It is a rare study on the age of males at the birth of their first child. The study analyzes publicly available DHS data (2016 Uganda Demographic and Health Survey [UDHS] sample of 3,206 men aged 15-54 years who had a biological child) in an innovative way.

In Uganda, statistical analysis shows the median age at first birth is 22 years, most men (62.4%) became biological fathers for the first time between the ages of 18 and 24 years.

Outcome variable: male's age at first childbirth categorized as: below 17, 18-24 and 25 years and above (25+)

Analysis: descriptive statistics, un-adjusted and adjusted multinomial regressions with significance level at 95%

Results: Median age at first child's birth was 22 years (IQR = 20-25). The majority of men (62.4%) had fatherhood onset between 18 and 24 years. Only 5.2% had fatherhood onset at 17 years or earlier, increasing to 32.4% at 25+. Respondents whose first sexual encounter was before 18 years was 44.3% and 92.7% by 24+. Few respondents (44.1%) reported use of any contraceptive methods. Anglican religion (RRR=1.62; CI 1.06 – 2.46) or not having attended school (RRR=2.20; CI 1.02-4.71) were predictors of childbirth onset before 17 years. Age of sex debut at 18 years or higher (RRR= 2.09, CI 1.72 – 2.54) and secondary and above education (RRR = 1.76, CI 1.42-2.18) were predictors of fatherhood onset at 25+. Contraceptive use among men had no association with age at first child's birth. **This is surprising. Was it possible to ascertain contraceptive use among the male's partner?**

“Conclusion: These findings are important for strategic allocation of resources to curb early onset of fatherhood among adolescent and young men under the age of 25 years. They highlight the need for gender-sensitive interventions targeting men for behavioral change, participation in Sexual and Reproductive Health Rights (SRHR) programming and improved access to services delivery.” **If contraceptive use had no association, what behaviour change are you suggesting? Which interventions might work? It would be useful to be more specific here.**

**Good use of literature findings here.** “Literature indicates that there is scarcity of evidence to demonstrate that men have been directly targeted by or are primary beneficiaries from reproductive health programs and activities (Sternberg & Hubley, 2004; Kabagenyi et al., 2014a; Onyango et al., 2010). As a consequence, male fertility in the sub-Saharan African region has remained high – two-fold times higher than female fertility (Ntozi, 1995; Schoumaker, 2017; Snow et al., 2013). The high fertility in these regions could be attributed to the male dominance in sexual relationships and marriage, high desire for large families and polygamy, little or lack of couple discussion on childbearing and disapproval of contraceptive use among men (Berhane et al., 2011; Kabagenyi et al., 2014a; Ntozi, 1995; Schoumaker, 2017; Snow et al., 2013). This paper provides an opportunity to profile the predictors of first child's birth among men aged 15–54 years in Uganda, with the aim of enhancing knowledge and contributing to an increase in the demand and utilization of reproductive health services among men.

The literature on age at first child's birth and the associated predictors among men has remained scarce in most developing countries in spite of numerous studies on reproductive health issues and childbearing. Existing evidence shows that most studies on first childbirths and reproductive health matters focus on women rather than men (Kabagenyi et al., 2014a; Macutkiewicz & MacBeth, 2017; Neal et al., 2015). However, a few studies in the literature which focused on men show that age at first child's birth is not only an important predictor of fertility among men, but

also it is central in influencing national and global trends of health indicators (Finer & Philbin, 2014; Martinez et al., 2012). Early age at first childbirth among men increases the risks of suffering from depression, parenting difficulties, psychological conditions such as poor mental health during late adulthood and high mortality odds.” **Interesting – is there any literature indicating that the age of the biological father has an impact on the health of the infant/child?**

“Benefits have been associated to delaying the age at first birth among men, and they include: enabling men to complete and attain higher education, prepare for future prospects such as engaging in income generating ventures and pursue better employment or career development during adolescence and young adulthood; reducing the risk of undesired consequences that may arise from unwanted teenage pregnancies, abortions among sexual partners and those associated with teenage fatherhood (Darroch et al., 2016; Kato-Wallace et al., 2016).”

“Specifically, the study examined the relationship between contraceptive use, age at first sex, education, financial status, place of residence, occupation, ethnicity and age at first child’s birth.”

Hypotheses:

- Men with secondary and higher education levels are more likely to have a higher age at first child’s birth than those with no education.
- Men who experience sexual debut after age 25 years are likely to have a higher age at first child’s birth than those with early sex debut defined as age less than 17 years.
- Men in rural areas have increased likelihood of having a lower age at first child’s birth than those in urban areas.
- Men who use contraceptives are more likely to have a higher age at first child’s birth than those who don’t use.

“The findings of this study are crucial in improving male participation in reproductive health by targeting men’s behavior and social norm changes to limit teenage or early fatherhood, and to empower young couples to negotiate family planning decisions for improved contraceptive uptake freely. Second, the findings will enhance building the capacity of skills among healthcare providers in facilities to adequately engage and provide reproductive healthcare services to men. This strategy is anticipated to encourage men to take the lead as users, potential clients, and partners in accessing reproductive healthcare. Lastly, these findings will influence policymakers engaged in reproductive health programming to develop gender-sensitive policies that respond to the needs of the vulnerable young men, so that such men are targeted with efficient and effective interventions for improved male involvement and reproductive health services delivery.”

“Question on number line 211: How old were you when your (“first” applies if a respondent has had already more than one child) child was born? The response to this question was re-coded numerically in completed years of age.”

“Independent variables were grouped into categories as hypothesized to influence the dependent variable.”

“Socio-demographic and economic variables included: religion, ethnicity, education, financial status, occupation, partner-age difference, place of residence, and mass media exposure (including internet use).”

“One of the categories considered for the occupation variable was white-collar jobs, this was defined as occupations that are managerial, technical, clerical or sales based.” **Was this a hypothesis?**

“Proximate variables included: contraceptive use and age at sex debut. Precipitating variables, including previous exposure to parental Intimate Partner Violence (IPV) and forced sex, were included to examine their influence on age at first birth.”

### “Results”

“Precipitating factors such as exposure to mass media, forced sexual acts and exposure to parental intimate partner violence were not significantly associated with age at first childbirth among the participants. Likewise, contraceptive use as a proximate factor was not significantly associated with age at first childbirth among men. All the variables that were significantly associated with age at first childbirth were included in the adjusted multivariate analysis models.”

### “Factors associated with age at first child’s birth among men at multivariate analysis”

“Adjusted multivariate analysis results (Table 3) showed that men with no education were 2.2 times (RRR=2.2; CI: 1.02 – 4.71) more likely to have first their child by 17 than between 18–24 years compared to those with primary education, other factors remaining constant. On the contrary, men with secondary or higher education were 0.4 times less likely to have their first child (RRR=0.44; CI:0.22-0.89) by the age of 17 than 18–24 compared to those with primary education, holding other factors constant. Men with secondary or higher education were 1.8 times (RRR=1.76; CI: 1.42-2.18) more likely to have their first child by the age of 25 and above than between 18–24 years compared to those with primary education, holding other factors constant. With regards to ones’ ethnicity, Banyoro men were 0.5 times (RRR= 0.48; CI 0.30-0.78) less likely to have their first child by 25 and above than between 18–24 years compared to the Banyankore holding other factors constant. Similarly, among the Baganda men were 0.6 times (RRR=0.61; CI: 0.41-0.81) less likely to have their first child aged 25 and above than between 18–24 years compared to Banyankore holding other factors constant. Regarding religious affiliation, Anglican men were 1.6 times more likely to have their first child by 17 than between 18–24 (RRR=1.61; CI: 1.060 - 2.46) compared to Catholic men. Men were asked about their age at first sexual encounter, this variable was included in the analysis to examine its predictability to the age at which men had their first child.”

Table 3 shows men whose age at **reported** first sexual encounter was 18+ (18 years and above) were 0.1 times less likely (RRR: 0.06; CI:0.03 – 0.11) to have their first child by 17 than between 18–24 years compared to those who had their first sexual encounter when less than 17 years.

**Please add the word ‘reported’ here; otherwise it is obvious that men who did not have sex before 18 would not become biological fathers by age 17.**

### “Discussion”

“Studies on predictors of age at first child’s birth among men in Uganda are uncommon. This paper aimed at examining the socio-demographic, economic and proximate predictors of age at first child’s birth among men aged 15–54 years in Uganda. This study showed that almost three-quarters of the men had their first child as youths, before 25 years. These results are comparable with findings from a study that evaluated trends and characteristics of age at first child’s birth among adolescent girls and young women within the East African countries, which showed that Uganda was one of the countries with the highest proportion of first childbirth among adolescent girls before 20 years of age (Neal et al., 2015). This result may suggest that the determinants of

age at first child may be similar between genders. Prior to this research, little has been published focusing on males despite a high prevalence of low age at first child's birth among both young men and women, this paper aimed to address this gap. This finding implies that interventions and policy reforms to curb early onset of childbearing among young people should target men younger than 25 years as well."

"This study revealed that nearly all men surveyed had their sexual debut before 25. Both bivariate and multivariate analysis showed that age at first sex was a proximate predictor of age at first child's birth. This finding is in agreement with another comparative study conducted among the sub-Saharan African countries where more than half of the adolescent men had sexual debut before 25 (Johnson & Gu, 2009). In many African societies behavioral maladjustment disorders, peer perceptions, negative sociocultural sex initiation values and poor parenting are direct determinants of early sex debut among adolescents (Babalola, 2004; Peltzer, 2010). This implies that interventions to ensure safer sexual behaviors have to be implemented and should aim at ensuring universal access to information about the benefits of safer practices and available contraception commodities to decrease the risk of first child's birth among adolescent men."

**Study showed no association between contraceptive use and age at first child; need to further elaborate on this. Was it consistent contraceptive use? Should better sex education be a recommendation? What methods are men using? Did you include traditional methods (withdrawal) in the mix?**

"Contraceptive use was not found to be a predictor of age at first child's birth among men. Though contraceptive use is a proximate determinant of childbirth, it is argued in the literature that willingness for contraception uptake increases mainly after the first child's birth and with subsequent births, especially among young couples for the purposes of child spacing and limiting. Studies in Rwanda and India demonstrated that the propensity for a couple without a child to demand contraception use is often significantly reduced (Jayaraman et al., 2009; Rao & Mathada, 2016). Similar to another study conducted while comparing developing countries, it indicated that less than half of married and unmarried sexually active men used any form of contraceptives (Johnson & Gu, 2009). This evidence highly suggests that the low uptake of contraceptives among men is partly the explanation for this result. There are several factors documented in the literature that may explain low contraceptive use levels among men. These include: a high prevalence of negative socio-cultural expectations and values attached to childbirth behavior and practices, misconceptions and fears about modern contraceptives, over-reliance on traditional contraceptive methods, prevalence of negative gender attitudes, limited opportunity for male discussion of family planning with health workers, and limited awareness about the role of men in fertility control to mention but a few (Kabagenyi et al., 2014a; Kabagenyi et al., 2014b; Kabagenyi et al., 2016; Johnson & Gu, 2009; MacQuarrie et al., 2015). Thus, the current relationship of contraceptive use and age at first child's birth in this study may likely be a result of a conflict between the influences of factors that are negatively associated with contraceptive use and its low uptake among men."

"The study also showed that education was a positive predictor of late age at first child's birth. Previous studies conducted in the African region have consistently indicated that lack of or low education is a strong predictor of onset of teenage childbearing, especially among girls (Neal et al., 2015; Peltzer, 2010). This study has also shown similar results among men. Secondary and higher education reduce risks for not working, reverses negative socio-cultural values and norms, and other negative attitudes which are associated with early sexual debut and low contraceptive

use among men (Johnson & Gu, 2009). Thus, secondary and post-secondary education improves contraceptive use and creates employment opportunities which result in delayed onset of fatherhood. This finding is consistent with the study hypothesis that men with secondary and higher education levels are more likely to have a higher age at first child's birth than those with no education. This result implies that any interventions and programs that are aimed at curbing teenage fatherhood should prioritize second chance formal education at primary and secondary levels, address barriers of access to universal secondary education and also promote incentives for post-secondary and higher education completion among men."

"Ethnicity was found to be a predictor of age at first child's birth both at the bivariate and multivariate analysis levels. Possibly, cultural values, diversity in norms, and variations in the understanding of sexual roles and childbearing rewards explain the relationship between ethnicity and age at first child's birth, as these are influenced by socio-economic factors. This finding was consistent with results from studies performed among women (Hirschman & Rindfuss, 1980; Matthews & Hamilton, 2009). However, the determinants for this relationship need to be further studied among men."

"Religious affiliation, specifically Anglican denomination was found to be a significant predictor of early onset of fatherhood among the respondents. The relationship between religious affiliations and age at first childbirth has been observed among women in other countries such as Nigeria and Bangladesh (Fagbamigbe & Idemudia, 2016; Sarkar, 2010). However, this relationship among men has not been fully explored and this result provides a basis for further understanding of such dynamics in a Ugandan context. There is a need for more explorative research to study this phenomenological finding."

**Suggestion:** Make a table of the hypotheses that the authors tested and the results. This will make them easier to track.

**Hypothesis**  
**True/False**  
**Findings**  
**Implications**

**Hypothesis:** Men with secondary and higher education levels are more likely to have a higher age at first child's birth than those with no education.

**True/False:** True

**Findings:** Men with no education were 2.2 times (RRR=2.2; CI: 1.02 – 4.71) more likely to have first their child by 17; men with secondary or higher education were 0.4 times less likely to have their first child (RRR=0.44; CI:0.22-0.89) by the age of 17 than 18–24 compared to those with primary education.

**Implications:** Prioritize second chance formal education at primary and secondary levels, address barriers of access to universal secondary education and also promote incentives for post-secondary and higher education completion among men.

**Hypothesis:** Men who experience sexual debut after age 25 years are likely to have a higher age at first child's birth than those with early sex debut defined as age less than 17 years.

**True/False:** Not proven

**Findings:** Nearly all men surveyed had their sexual debut before 25.

**Implications:**

**Hypothesis:** Men in rural areas have increased likelihood of having a lower age at first child's birth than those in urban areas.

**True/False:** True

**Findings:** Men in rural areas have increased likelihood of having a lower age at first child's birth than those in urban areas.

**Implications:**

**Hypothesis:** Men who use contraceptives are more likely to have a higher age at first child's birth than those who don't use.

**True/False:** False

**Findings:** No association between contraception use and age at first birth.

**Implications:** Promote consistent and correct use of male contraceptives; encourage dialogue between young women and young men about family planning.

**Hypothesis:** Men who experience sexual debut after age 25 years are likely to have a higher age at first child's birth than those with early sex debut defined as age less than 17 years.

**True/False:** Not proven

**Findings:** Nearly all men survey had their sexual debut before 25.

**Implications:**

**Hypothesis:** Men who use contraceptives are more likely to have a higher age at first child's birth than those who don't use.

**True/False:** False

**Findings:** No association between contraception use and age at first birth.

**Implications:** Promote consistent and correct use of male contraceptives; encourage dialogue between young women and young men about family planning.

**Is the work clearly and accurately presented and does it cite the current literature?**

Yes

**Is the study design appropriate and is the work technically sound?**

Yes

**Are sufficient details of methods and analysis provided to allow replication by others?**

Yes

**If applicable, is the statistical analysis and its interpretation appropriate?**

Partly

**Are all the source data underlying the results available to ensure full reproducibility?**

Yes

**Are the conclusions drawn adequately supported by the results?**

Partly

**Competing Interests:** No competing interests were disclosed.

**Reviewer Expertise:** reproductive health; family planning, health systems strengthening, behavioral economics, behavioral change, health services delivery, systems thinking

**I confirm that I have read this submission and believe that I have an appropriate level of expertise to confirm that it is of an acceptable scientific standard, however I have significant reservations, as outlined above.**

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