The time to first child birth after onset of sexual activity among women and men in Uganda using the Cox Proportional Hazard analysis

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Introduction

The study examined trends for timing of first child birth after onset of sexual activity and the associated time to event exposure factors among men and women in Uganda.

Methods

Analyzed Uganda Demographic Health Survey (UDHS) data (2001-2016). Regression analysis was done using UDHS 2016. Inclusion criteria only considered women (15-49 years old) and men (15-54 years old) who had reported data on age at first sex. Table 2 shows results for the test of proportional hazard assumptions and model goodness of fit.

Results

In Table 1, there was certainly not any change in the median age at first child birth among both men and women in the period 2001 – 2016. As a result, the time interval between onset of sexual activity and first child birth remained stationary at 2 and 5 years respectively, among women and men in the same period. The mean age at first birth increased very slightly from 22 – 23 years (SD ± 4, p-value = 0.034) among men and, 18 -19 years (SD±3, p-value <0.000) among women in the period 2001 – 2016. In 2016, the median time to first child birth among men was 22 (IQR: 20-25) years and the incidence rate was 4.3%. Similarly, the median time to first birth among women was 18 (IQR: 16-20) years and the incidence rate was 5.4%. Cohabitation before age 24 years was associated with early timing of age at first child birth after onset of sexual activity among women, yet on the contrary, being never cohabited among men was associated with early timing of age at first child birth.

Time to event Cox Proportional Hazard (Cox PH) regression results among women. Busoga region (p<0.000), having primary education (p<0.000), age at first cohabitation less than 24 years (p=0.003) and poorer wealth status (p=0.005) had increased relative risk of shorter time to first child birth after onset of sexual activity among women, keeping other factors constant. Similarly, Ankole and Kigezi region (p<0.000), secondary and higher education (p<0.000), Protestant and Pentecostal religion (p<0.01), age at first cohabitation higher than 25 years (p<0.000) had reduced relative risk of shorter time to first child birth after onset of sexual activity, keeping other factors constant. Listening to radio, watching television, reading newspapers and magazines and urban place of residence had reduced hazard ratios for first child birth keeping other factors constant, though this was not statistically important. Similarly, husband or joint decision on either to use contraception or not for family planning had increased hazard rations for first child birth keeping other factors constant, though this was not statistically important. In figure 1, first cohabitation at 25 years and higher increased time to first child birth among both men and women.

Time to event Cox PH regression results among men. The perception that women who use contraception become promiscuous (p=0.036) and watching television (p<0.000) had increased hazard rations for first child birth following sex debut and keeping other factors constant. Muslim (p=0.307) and Protestant religion (p=0.538) had increased hazard ratios for first child birth keeping other factors constant, but were not statistically important. On the contrary, timing of first cohabitation after 25 years of age (p<0.000), reading newspapers and magazines (p<0.01) had reduced hazards ratios for first child birth, keeping other factors constant. Higher education attainment (p=0.062), urban place of residence (p=0.329) and listening to radio everyday (p=0.816) had reduced hazard ratios for first child birth after onset of sexual activity, but were not statistically important.

Conclusion

Primarily, secondary and higher education, poor wealth status and the age at first marital union formations influence the time to first child birth among women, while the prevalence of myths and misconceptions on contraception, watching television and the age at first marital union formation are important among men. Policy interventions to delay early cohabitation should be prioritized to reduce adolescent marital union formations among both men and women. Mass media edutainment on sexual and reproductive health rights and family planning should appropriately meet the age and gender sensitive needs of the population. Demystifying beliefs among men that women who use contraception are promiscuous or that the uptake of contraception is a woman's business should also be prioritized. Policy reforms to improve secondary and higher education attainment are very crucial for both women and as well for men. Improving the time to first child birth among both men and women is expected to have a positive impact on contraceptive use, reduction of child mortality and stunting, maternal mortality among adolescent women, fertility rates, improved economic prospects and attainment of Sustainable Development Goals.

Table 1 Trends for the median interval between age at first sex and child birth

	Median age at sex debut		Median age at first child birth		Median age interval between sex debut and first child birth	
UDHS Year	**Women**	**Men**	**Women**	**Men**	**Women**	**Men**
2001	16	17	18	22	2	5
2006	15	16	18	22	3	6
2011	16	17	18	22	2	5
2016	16	17	18	22	2	5

Table 2 Regression diagnostics: model goodness of fit

Gender	Models	Model fit test: Information Criterion		Test for Proportional Hazard Assumptions	
		Alkaike IC	**Log likelihood**	**p-value (95%)**	**Global test chi2 (df)**
Women	Model 1: Without variable on exposure to parental IPV	235717.4	-117829.71	0.000	677.2 (29)
	Model 2: With variable on exposure to parental IPV	235719.3	-117829.64	0.000	678.0 (30)
Men	Model 3: Without variable on exposure to parental IPV	45264.1	-22604.07	0.000	160.7 (28)
	Model 4: With variable on exposure to parental IPV	45266.1	-22604.05	0.000	160.9 (29)

Table 3 Cox Proportional Hazards regression for men and women for the 2016 UDHS

Variables	Men		Women	
	Hazard Ratio	95% Confidence Interval	Hazard Ratio	95% Confidence Interval
Region				
Kampala	1.000			
Buganda	0.905	0.744 - 1.100	1.07	0.978 - 1.170
Busoga	1.08	0.865 - 1.348	1.267***	1.142 - 1.405
Bukdi and Bugishu	0.977	0.791 - 1.207	1.048	0.949 - 1.158
Teso, K'jong and and Lango	0.947	0.767 - 1.167	0.962	0.872 - 1.062
Acholi and Westnile	0.955	0.769 - 1.186	0.99	0.895 - 1.095
Bunyoro and Tooro	0.995	0.811 - 1.221	0.987	0.897 - 1.087
Ankole and Kigezi	0.856	0.693 - 1.056	0.717***	0.650 - 0.792
Education				
No education	1.000			
Primary	1.081	0.921 - 1.268	1.156***	1.097 - 1.217
Secondary	0.953	0.799 - 1.137	0.821***	0.768 - 0.877
Higher	0.825*	0.674 - 1.009	0.501***	0.455 - 0.550
Religion				
Catholic	1.000			
Protestant	1.026	0.945 - 1.114	0.934***	0.896 - 0.973
Muslim	1.066	0.943 - 1.203	0.985	0.929 - 1.046
Pentecostal and Others	0.973	0.864 - 1.096	0.937**	0.889 - 0.987
Contraception is a woman's business				
No	1.000		Na	
Yes	0.935	0.857 - 1.021	Na	
Contraception for promiscuous women				
No	1.000		Na	
Yes	1.080**	1.005 - 1.161	Na	
Age at first cohabitation				
Never Cohabited	1.000			
Less than 24 years	0.857	0.688 - 1.068	1.131***	1.043 - 1.226
25 years and above	0.312***	0.249 - 0.392	0.478***	0.431 - 0.530
Ideal children by sex				
Desire Childlessness	1.000			
Desire either sex, boy or girl	0.992	0.732 - 1.345	1.06	0.907 - 1.240
Desire both sexes	0.955	0.839 - 1.086	1.042	0.988 - 1.099
Listen to radio				
No	1.000			
Irregular	1.026	0.896 - 1.175	0.962	0.911 - 1.015
Listens everyday	0.986	0.877 - 1.109	0.995	0.954 - 1.038
Watching television				
No	1.000			
Yes	1.211***	1.115 - 1.317	0.978	0.932 - 1.027

Table 3 (continued)

Variables	Men		Women	
	Hazard Ratio	95% Confidence Interval	Hazard Ratio	95% Confidence Interval
Reads Newspapers and magazines to access information				
No	1.000			
Yes	0.886***	0.809 - 0.969	0.97	0.921 - 1.023
Place of residence				
Rural	1.000			
Urban	0.947	0.849 - 1.057	0.972	0.922 - 1.024
Wealth Status				
Poorest	1.000			
Poorer	1.045	0.933 - 1.169	1.081***	1.023 - 1.141
Middle	0.921	0.817 - 1.039	1.057*	0.996 - 1.121
Richer	1.01	0.890 - 1.147	1.033	0.971 - 1.100
Richest	0.934	0.798 - 1.093	0.994	0.919 - 1.076
Decision on contraceptive use				
Woman's decision	Na		1.000	
Husband's decision	Na		1.023	0.952 - 1.100
Joint decision	Na		1.007	0.964 - 1.053
Other or no decision maker	Na		0.993	0.948 - 1.041
Observations	**3,206**		**13,740**	

Notes: *** p<0.01, ** p<0.05, * p<0.1; Na = No data

Figure 1 Kaplan Meier survival estimate graphs for age at first birth among women and men