Male Fertility Estimates in Uganda: 2001-2016

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Introduction

Global population growth projections indicate that by 2050, a high concentration of the world's population growth is expected to occur mostly in nine countries which include India, Indonesia, Uganda, Democratic Republic of Congo, Ethiopia, Nigeria, Pakistan, United Republic of Tanzania and United States of America. In sub-Saharan African countries, male fertility rates are estimated to range between 1.5 and 2 times higher than the female total fertility rate. There is no nationally representative study so far on male fertility estimates in Uganda. Lack of knowledge on male fertility estimates limits understanding of fertility dynamics, negatively affects formulation and implementation of reproductive health and population control policies, and leads to failure to prioritize and plan for male reproductive health needs, worsens low male involvement and hinders access to reproductive health services – either those targeted for men themselves (like access to information on sexual and reproductive health and vasectomy services) or those intended to improve women's health. Therefore, this paper seeks to estimate male fertility levels and patterns for the period 2001 – 2016 in Uganda. The goal is to understand male fertility dynamics so as to inform fertility control, sexual and reproductive health policies in Uganda. This research was conceptualized basing on the Own Children Method (OCM), which is an indirect technique of current fertility estimation. The unique strength of the OCM technique lies in its ability to provide valid, current fertility estimates based on cross-sectional household data in absence of full birth history and reliable vital registration system data for studying population fertility differentials, levels and trends. In this study, it is hypothesized that male fertility estimates have significantly declined in the period 2001-2016.

Findings from this research will be useful in guiding implementation of programs that will enable Uganda to achieve the indicator targets for the third Sustainable Development Goal (SGD) of ensuring healthy lives and promoting wellbeing for all at all ages by the year 2030. By focusing on male fertility reduction approaches, the proportion of women exposed to the risk of maternal mortality will reduce, the proportion of under 5 children dying from preventable deaths will decline, while improvement in universal access to sexual and reproductive healthcare services will significantly increase modern contraceptive prevalence and also reduce adolescent birth rates. This may enhance realization of the Uganda Vision 2040 target of a reduced population growth rate at 2.4% by the year 2040. It will also provide knowledge to enhance implementation of programs targeting men to improve the poor socio-economic outcomes, psychological disorders and other advanced age related chronic illness that are positively associated with early fatherhood that occurs during adolescence and young adulthood. Significant decline of both male and female fertility rates is needed for Uganda to achieve her desired targets on fertility decline, national economic growth and development.

Methods

This study was based on cross-sectional data to estimate period fertility among men who reported having fathered a child during the 2001 – 2016 surveys. Geographical scope focused on the entire country. Analyzed data was obtained from the Uganda Demographic Health Surveys (UDHS) that were conducted in 2001, 2006, 2011 and 2016 for all children aged 0-4 years and their biological fathers. The household files (HR) and women's individual (IR) files from all the four datasets were used for the estimation of male fertility in Uganda. UDHS provided nationally representative data that was suitable for this study. The HR file provided household schedule data on member characteristics, the IR file provided data on children characteristics from the woman's individual full birth history. A sample size of households considered for this study was 7,885 in 2001; 8,870 in 2006; 9,033 in 2011 and 19,588 in 2016. The study variables included the line number of a household member, mother and father, sex and age of the household member, survival status of natural parents (mother and father) and their children and date of birth for all children born alive among women 15-49 years during inter-DHS periods. The line number of a household member provides the position of the father and mother in a household. The outcome variable was period Age Specific Fertility Rates (ASFRs) among men. Data analysis was performed using the "Own Children Method" technique and STATA software version 14, by linking children aged 0-4 years to their natural parents in each household. The estimated age specific total births of the fathers and exposure to child birth were used to compute the age specific male fertility rates as shown in the formula below.

$$\text{Age Specific Fertility Rates (ASFRmale)} = \frac{\sum Total\ Births\ at\ age\ x}{\sum Exposure\ at\ age\ x} \quad \text{(Eq. 1)}$$

$$\text{TFRmale} = 5^{*}\sum ASFRmale \quad \text{(Eq. 2)}$$

Permission to use the UDHS data sets was obtained online from the Monitoring and Evaluation to Assess and Use Results (MEASURE) DHS program. The datasets are available online and can be accessed by applying through the DHS website. Data analyzed for this research was used only for the intended academic and publication purposes; and it was accessed by using the following login link: http://www.dhsprogram.com/data/dataset_admin/login_main.cfm

Results

Table 1: Descriptive Summary Statistics for Age of the Father at Birth of a Child.

Table 1

Descriptive statistics for father's age at birth of a linked child aged 0-4 years in the period 2001-2016

Year	Mean	Median	IQR
2001	32.3	30	26-37
2006	33.1	32	27-38
2011	33.1	32	27-38
2016	33.1	32	26-38

Note.

IQR= Interquartile Range

Table 2: Inverse Survival Probabilities for Children aged 0-4 years

Table 2

Survival probabilities by age between 2001 and 2016

Age of children	Year 2001	Year 2006	Year 2011	Year 2016
0	1.06	1.06	1.04	1.04
1	1.10	1.09	1.07	1.05
2	1.15	1.10	1.07	1.06
3	1.15	1.12	1.10	1.06
4	1.18	1.13	1.08	1.06

Table 3: Estimation of Male Fertility

Table 3

Distribution of Age Specific Fertility Rates (ASFRs) and Total Fertility Rates among men aged 15-79 years in 2001-2016

Age groups	Year 2001				Year 2006				Year 2011				Year 2016			
	Alive	Total births	Exposure (years)	ASFR	Alive	Total births	Exposure (years)	ASFR	Alive	Total births	Exposure (years)	ASFR	Alive	Total births	Exposure (years)	ASFR
15-19	42	46	1678	0.0274	38	41	1908	0.0215	32	34	1,722	0.0197	53	56	2,514	0.0223
20-24	615	682	3063	0.2227	618	673	3207	0.2099	603	641	3,306	0.1939	1,510	1,594	8,269	0.1928
25-29	1754	1969	5570	0.3535	1785	1959	5577	0.3513	1,761	1885	5,889	0.3199	3,165	3,351	11,266	0.2974
30-34	1845	2083	5809	0.3586	1930	2123	5713	0.3716	1,807	1938	5,510	0.3517	3,599	3,813	12,183	0.3130
35-39	1333	1506	4718	0.3192	1779	1958	6072	0.3225	1,718	1844	5,674	0.3250	2,932	3,108	11,538	0.2694
40-44	721	815	3246	0.2511	954	1051	3788	0.2774	1,056	1136	4,632	0.2453	1,979	2,099	9,316	0.2253
45-49	554	628	3386	0.1855	660	728	3915	0.1859	666	716	4,088	0.1751	1,354	1,436	9,095	0.1579
50-54	239	271	2058	0.1317	248	274	2552	0.1074	325	350	3,596	0.0973	623	661	7,567	0.0874
55-59	127	145	2018	0.0719	142	157	2028	0.0774	127	136	1,905	0.0714	206	218	3,834	0.0569
60-64	95	108	2194	0.0492	74	83	1764	0.0471	98	105	2,115	0.0496	183	194	6,064	0.0320
65-69	43	49	1223	0.0401	42	46	127	0.3622	33	36	4,705	0.0077	61	65	4,513	0.0144
70-74	32	37	2631	0.0141	34	37	1587	0.0233	3	3	577	0.0052	17	18	2,049	0.0088
75-79	11	12	836	0.0144	19	21	935	0.0225	7	8	1,399	0.0057	62	66	18,308	0.0036
∑ASFR				2.0391				2.3799				1.8675				1.6810
TFRm	5*(∑ASFR) = 5*2.0391 = 10.2				5*(∑ASFR) = 5*2.3799 = 11.9				5*(∑ASFR) = 5*1.8675 = 9.3				5*(∑ASFR) = 5*1.6810 = 8.4			

Note.

ASFR = Age Specific Fertility Rate; TFRm = Male Fertility Rate

Table 4: Changes in Male Fertility

Table 4

Distribution of percentage change in male fertility by age group between 2001 and 2016

Age group	ASFR (2001) A	ASFR (2016) B	Rate Ratio (RR) B divided by A	Percentage change = (RR-1)*100
15-19	0.0274	0.0223	0.814	-18.6
20-24	0.2227	0.1928	0.866	-13.4
25-29	0.3535	0.2974	0.841	-15.9
30-34	0.3586	0.3130	0.873	-12.7
35-39	0.3192	0.2694	0.844	-15.6
40-44	0.2511	0.2253	0.897	-10.3
45-49	0.1855	0.1579	0.851	-14.9
50-54	0.1317	0.0874	0.664	-33.6
55-59	0.0719	0.0569	0.791	-20.9
60-64	0.0492	0.0320	0.650	-35.0
65-69	0.0401	0.0144	0.359	-64.1
70-74	0.0141	0.0088	0.624	-37.6
75-79	0.0144	0.0036	0.250	-75.0
TFRm	10.2	8.4	0.824	-17.6

Note.

ASFR = Age Specific Fertility Rate

TFRm = Male Fertility Rate

Negative sign (-) = means a reduction in male fertility rates