The relationship between the sequence of first sexual, marriage and birth events and later-life reproductive metrics among Ugandan women: Insights from a Cross-sectional Study.

Christabellah Namugenyi[1], Claire Ashaba[1]

[1] Makerere University, Uganda

Corresponding author: Christabellah Namugenyi

Telephone: +256 788101810

Email: tabellahn@gmail.com

The relationship between the sequence of first sexual, marriage and birth events and later-life reproductive metrics among Ugandan women: Insights from a Cross-sectional Study.

Abstract

This study focused on Ugandan women's early life experiences and how that accounts for their reproductive outcomes later in life. The first marriage, sex, and birth events occured in four different sequences, according to the 2016 Uganda Demographic and Health Survey (UDHS), which included 57,906 women. Sequences included marriage, sex, birth; sex, birth, marriage; sex, marriage, birth; and sex, birth (no marriage). By age of 16, 72% of women had engaged in premarital sex. Marriage began early, at the age of 17, and childbirth frequently occurred within a year of the marriage. In the later lives of women who followed marriage-related sequences, the study highlights a high association between marriage and increased fertility rates, contraceptive use, and pregnancy termination in the presence of control variables. The study elucidates the dynamics of Ugandan women's reproductive behavior. Advocating for focused interventions is necessary to support young women and adolescent girls' reproductive outcomes.

Key words: First Sexual, Birth, Marriage, Reproductive metrics

Introduction

In Uganda, reproductive metric indicators, such as the total fertility rate, the use of contraceptives, and the pregnancy termination rate, have shown slow progress over time despite efforts by various interventions to improve them. Within a decade i.e. from 2006 to 2016, TFR declined from 6.7 to 5.8 (Ariho et al., 2018; Ariho and Kabagenyi, 2020), modern contraceptive use among women increased from 24.2 to 27.3% (Namasivayam et al., 2019) while pregnancy termination declined from 18.6% to 18.1% (Ibisomi and Odimegwu, 2010; Mwebesa et al., 2022). This indicates a persistent gap in effectively addressing reproductive health challenges. The fact that there has been no discernible improvement highlights the need for a more thorough comprehension of the underlying causes of the stagnation in reproductive health indicators. The order in which important life events occur i.e. one's first sexual experience, marriage, and childbirth affects how a person develops reproductively over time (Melesse et al., 2021).

Knowing the progression of a woman's first sexual experience, marriage, and childbirth offers important insights into her early experiences and the state of her reproductive health today. Marriage when under-aged can restrict one's access to school and employment, which can affect decisions about family planning, the use of contraceptives, and whether or not to terminate a pregnancy. Additionally, giving birth at a young age raises the chances of maternal and infant mortality and can continue the cycle of poverty and inequality (Navideh Noori et al., 2022). Likewise, participating in sexual activity at a young age, especially without proper sex education and access to contraceptives, raises the risk of unintended pregnancies and sexually transmitted infections. Despite the ongoing efforts to enhance reproductive health indicators in Uganda, there are still significant gaps in reaching the intended goals.

To address issues related to reproductive health, a number of initiatives have been put into place, such as campaigns to improve maternal healthcare services, encourage family planning, and expand access to contraceptives. Furthermore, educational campaigns have been implemented to promote healthy behaviors and increase public awareness of issues related to reproductive health outcomes (Meherali et al., 2021; Nalwanga et al., 2021). A prominent deficiency pertains to the execution and endurance of reproductive health initiatives. Even though interventions may be effective in the short term, sociocultural variables, continue to have an impact on reproductive behaviors and healthcare access (Ninsiima et al., 2021; Usonwu et al., 2021), which in turn affects the timing and sequence of marriage, childbirth, and sexual activity among girls and young women.

Early experiences could have an impact on decisions about fertility, the use of contraceptives, and attitudes toward reproductive health. Understanding the connection between women's early experiences and the state of later-life reproductive health indicators is necessary to create more effective strategies for enhancing women's reproductive health outcomes and well-being. In order to address the underlying causes of stagnation in reproductive metrics and support positive reproductive trajectories for women in Uganda, comprehensive research efforts are required in order to inform evidence-based interventions and policy decisions. Therefore, the purpose of this study was to ascertain how later-life reproductive metric indicators among Ugandan women relate to the order of first sexual, marriage, and birth events.

Literature review

This section outlines the conceptualization of reproductive metric indicators used in previous research to assess women's reproductive behavior and events of their first sexual encounters, marriage, and childbirth.

Total Children Ever Born (CEB)

CEB is a crucial indicator in reproductive health research that reflects a woman's fertility and reproductive history. Various studies have defined CEB differently, with some viewing it as a tally of biological children born to a couple. Numerous studies have examined the sociodemographic traits such as age, education, marital status, and socioeconomic status that affect CEB (Ariho et al., 2018; Ninsiima et al., 2021). Furthermore, it has been determined that fertility intentions, cultural norms, and access to family planning services are important factors influencing the variation in CEB across populations (Ariho et al., 2018; Ariho and Kabagenyi, 2020; Ninsiima et al., 2021).

Pregnancy Termination

Termination of pregnancy, including induced abortion and miscarriage, is another important outcome variable. In order to understand the factors influencing people's decisions regarding abortion and the implications for maternal health and reproductive rights, studies have looked at pregnancy termination rates, trends, and determinants. Pregnancy termination concepts frequently take into account things like legal constraints, socioeconomic status, education, access to safe abortion services, and cultural perceptions of abortion. Qualitative research has shed light on women's experiences, thought processes, and the sociocultural environment around pregnancy termination (Ibisomi and Odimegwu, 2010; Mwebesa et al., 2022).

Contraceptive Use

The use of contraceptives is essential for reducing the number of unwanted pregnancies, encouraging reproductive autonomy, and enhancing the health of mothers and children. Researchers have defined the use of contraceptives in terms contraceptive method choice, consistency of use, and prevalence. Studies on the use of contraceptives have looked at structural determinants like healthcare systems, policy environments, and socio-cultural family planning norms, as well as individual-level factors like knowledge, attitudes, beliefs, and access to contraceptive methods (Andi et al., 2014; Namasivayam et al., 2019). In order to comprehend the dynamics of contraception and provide guidance for programmatic interventions, longitudinal studies have looked at patterns of contraceptive initiation, discontinuation, and switching over time (Ariho and Kabagenyi, 2020).

Marriage Before First Birth

Conceptualizations of the order of marriage prior to the first child's birth emphasize normative and cultural expectations for the establishment and growth of families. Research has revealed disparities in the frequency and timing of pre-first-child marriages among diverse populations and historical eras (Alazbih et al., 2023; Amongin et al., 2020; Shasha et al., 2023). The timing of marriage trajectories and their relationships to sociodemographic traits, fertility intentions, and the use of contraceptives have all been studied.

Birth Before Marriage

The order of birth preceding marriage questions established conventions regarding the establishment of families and might be an indication of changes in public perceptions of marriage and parenthood. The socioeconomic, cultural, and contextual elements influencing non-

marital childbearing and its effects on individuals and families are examined in this field of study (Fan and Koski, 2022; Usonwu et al., 2021). Research has looked at the frequency of having children outside of marriage, the factors that influence it, and the results in terms of socioeconomic disadvantage, educational attainment, and the health of mothers and children. Qualitative research has yielded valuable insights into the motivations, decision-making processes, and experiences of individuals with regard to childbearing outside of marriage (Navideh Noori et al., 2022).

Sex Before Marriage

The order in which sex occurs prior to marriage is conceptualized in light of changing views on premarital sex and its effects on reproductive and sexual health. This field of study investigates the variables that affect when a person makes their sexual debut, such as peer pressure, media exposure, socialization processes, and availability of contraception and sexual education (Ninsiima et al., 2021). Research has looked at patterns of premarital sex, differences in first sexual experiences based on sociodemographic traits, and relationships with outcomes like the use of contraceptives, unplanned pregnancies, and STDs. Trajectories of sexual initiation and their consequences for people's well-being throughout their lives have been investigated (Usonwu et al., 2021).

To summarize, studies on reproductive health use comparable conceptions of reproductive metric indicators to look at different aspects of reproductive behavior.

Data and Methods

The 2016 Uganda Demographic and Health Survey (UDHS) dataset was utilized to analyze 57,906 Ugandan women, all of whom had given birth at least once and were eligible for

inclusion in the study. The sequences of first sexual activity, marriage, and childbirth for each woman were categorized into four sequences: Marriage, sex, birth; Sex, birth, marriage; Sex, marriage, birth; Sex, birth (no marriage). Summary statistics, including frequencies (percentages) and median ages (Interquartile range), were used to describe the sequence and timing (ages) of these events among Ugandan women. Associations between the different sequences and reproductive metric indicators were examined using one-way ANOVA and Pearson chi-square tests. The dependent variables of the study were Total number of children ever born, Pregnancy termination (Yes/No) and Contraceptive use (Yes/No). Adjusted Incidence-rate Ratios (IRR) and Adjusted Odds Ratios (AOR) from Multivariable Poisson and Logistic regression models were used to identify sequences and other factors explaining Ugandan women's reproductive metrics (the dependent variables) respectively. The independent and control variables included Sequence, socio-demographic variables (Current age, Region, Place of residence), and socio-economic variables (Highest level of education, Literacy, Wealth quintile, Health insurance coverage, Occupation) respectively. Conclusions for the study were drawn at a significance level of 5%.

Results

Univariate analysis

The table 1 outlines four distinct sequences of events, each characterized by the order in which sexual debut, marriage, and childbirth occur, along with corresponding statistics on the number of women and median age intervals.

Sequence 1: Marriage, sex, birth

A substantial proportion of women (25.6%) experienced marriage before initiating sexual activity, with both events typically occurring around the age of 16 to 17. Childbirth followed shortly thereafter, with a median age of 17.

Table 1: The sequence and timing of first sexual, marriage and birth events among Ugandan women

Sequence	**Number of women, n (%)**	**Median age in years (IQR)**		
Marriage, sex, birth	14,849 (25.6)	16 (15, 18)	16 (15, 18)	17 (16, 19)
Sex, birth, marriage	10,409 (18.0)	15 (14, 17)	17 (15, 19)	21 (19, 25)
Sex, marriage, birth	31,402 (54.2)	16 (15, 18)	17 (15, 19)	18 (16, 20)
Sex, birth (no marriage)	1,246 (2.2)	16 (15, 18)	18 (16, 21)	
Total	**57,906 (100%)**			

Sequence 2: Sex, birth, marriage

This sequence represents a smaller proportion of women (18.0%) who experienced sexual debut before marriage, followed by childbirth. However, marriage occurred later in this sequence, with a median age of 21, suggesting a delay in formalizing relationships following childbirth.

Sequence 3: Sex, marriage, birth

The majority of women (54.2%) followed this sequence, engaging in sexual activity before marriage, typically around the age of 16 to 17. Marriage occurred shortly thereafter, followed by childbirth at a median age of 18.

Sequence 4: Sex, birth (no marriage)

The minority of women (2.2%) experienced sexual debut followed by childbirth without formal marriage to-date. Sexual initiation typically occurred around the age of 16 to 17, with childbirth occurring later at a median age of 18.

Overall, the data highlights the prevalence of premarital sexual activity among Ugandan women, with over 72.2% engaging in such activity by the age of 16. Additionally, first marriages tend to occur early, typically at the age of 17, often followed by childbirth within a year. However, women who gave birth to their first child before marriage tended to delay formal marriage until the age of 21. These findings underscore the complex dynamics of reproductive behavior and the need for targeted interventions to promote reproductive health and well-being among Ugandan women.

Bivariate analysis

Insights into the bivariate relationship between the sequences of first sexual, marriage, and birth events and reproductive metric indicators among Ugandan women is presented. Table 2 outlines four distinct sequences of events and associations with their corresponding reproductive outcomes, including the total number of children ever born (CEB) on average, the prevalence of pregnancy termination, and contraceptive use.

Table 2: The sequence of first sexual, marriage and birth events and reproductive metric indicators among Ugandan women

Sequence	**Total CEB, average (SD)**	**Pregnancy termination - yes, n (%)**	**Contraceptive use - yes, n (%)**
Marriage, sex, birth (N=14849)	6.1 (2.8)	3,873 (26.1)	5,626 (37.9)
Sex, birth, marriage (N=10409)	6.1 (2.8)	2,944 (28.3)	3,835 (36.8)
Sex, marriage, birth (N=31402)	6.0 (2.8)	8,517 (27.1)	10,890 (34.7)
Sex, birth (no marriage) (N=1246)	3.1 (2.6)	148 (11.9)	361 (29.0)
p-value	**0.000**	**0.000**	**0.000**

In sequence 1, where marriage precedes sexual debut and childbirth, women have, on average, approximately 6.1 children. The prevalence of pregnancy termination is relatively high, with around 26.1% of women in this group having terminated pregnancies. Additionally, contraceptive use is prevalent, with 37.9% of women using contraceptives. In sequence 2, where sexual debut precedes childbirth and marriage, women have a similar average number of children as in the previous sequence (6.1). The prevalence of pregnancy termination is slightly higher, at 28.3%, compared to the previous sequence. Similarly, contraceptive use is also prevalent, with 36.8% of women in this group using contraceptives. In sequence 3, where sexual debut precedes marriage and childbirth, women have, on average, slightly fewer children (6.0) compared to the other sequences. The prevalence of pregnancy termination is higher, at 27.1%, compared to the sequence where marriage precedes sexual debut. Contraceptive use is also prevalent, with 34.7% of women in this group using contraceptives. In sequence 4, where sexual debut occurs without formal marriage before childbirth, women have significantly fewer children on average (3.1). The prevalence of pregnancy termination is notably lower, at 11.9%, compared to the other

sequences. However, contraceptive use remains prevalent, with 29.0% of women in this group using contraceptives.

Marriage serves as a contributing factor to childbirth, as evidenced by those who have experienced a marriage event having approximately double the number of children compared to women who have not experienced marriage. This difference is statistically significant ($p<0.05$). The rate of pregnancy termination among those who have undergone a marriage event is approximately twice as high compared to those who have not experienced marriage, with statistical significance at $p<0.05$. Additionally, the use of contraceptives is slightly more prevalent among women who have been through a marriage event compared to those who have not.

Multivariable analysis

Sequence one: Marriage, sex, birth

Women in this sequence are more likely to have more children in their lifetime ($p<0.05$) than women in the sequence where marriage is absent. Furthermore, compared to women in the sequence where marriage is absent, women who followed this sequence also exhibit a significantly higher likelihood of terminating a pregnancy ($p<0.05$). Nonetheless, compared to the sequence in which marriage is absent, there was a higher likelihood of contraceptive use among women in this sequence ($p<0.05$).

Sequence two: Sex, birth, marriage

Women who followed this sequence also have a higher lifetime probability of having more children ($p<0.05$) than those who followed the sequence where marriage was absent. Furthermore, compared to women who followed the sequence in which marriage was absent,

women who followed this sequence had a significantly higher likelihood of terminating their pregnancies ($p<0.05$). Moreover, there was increased likelihood of contraceptive use among women in this sequence compared to the sequence where marriage is absent ($p<0.05$).

Sex, marriage, birth

Women who followed this sequence were more likely to have more children over the course of their lifetime ($p<0.05$) than women who followed the sequence where marriage was absent. Women in this sequence also have a significantly higher chance of terminating their pregnancy than women who followed the sequence without a marriage event ($p<0.05$), which is similar to the other sequences with a marriage event. Additionally, there was increased likelihood of contraceptive use among women in this sequence compared to the sequence where marriage is absent ($p<0.05$).

Other Significant Control Factors Associated with outcome variables

Other control variables that significantly explain Total CEB include age, region, place of residence, highest level of education, literacy status, wealth quintile, health insurance ownership, and occupation ($p<0.05$). Other variables that significantly explain pregnancy termination include age, region, place of residence, highest level of education, literacy status, wealth quintile, and occupation ($p<0.05$). Other variables that significantly explain contraceptive use include age, region, place of residence, highest level of education, literacy status, wealth quintile, and occupation ($p<0.05$).

Table 3: Sequences and factors that explain women's reproductive metrics

Variable	Total Children ever born (Adjusted IRR [CI])	Pregnancy termination (Adjusted OR [CI])	Contraceptive use (Adjusted OR [CI])
Sequence			
Sex, birth (no marriage)	Reference	Reference	Reference
Marriage, sex, birth	**1.43 [1.38, 1.47]**	**2.01 [1.67, 2.39]**	**1.67 [1.46, 1.90]**
Sex, birth, marriage	**1.41 [1.37, 1.46]**	**2.16 [1.81, 2.58]**	**1.52 [1.33, 1.74]**
Sex, marriage, birth	**1.38 [1.33, 1.42]**	**2.09 [1.75, 2.50]**	**1.44 [1.27, 1.64]**
Current age			
15 – 24	Reference	Reference	Reference
25 – 39	**2.31 [2.27, 2.35]**	**2.02 [1.87, 2.18]**	**1.21 [1.14, 1.28]**
40 – 49	**3.26 [3.21, 3.31]**	**3.03 [2.81, 3.28]**	0.95 [0.89, 1.01]
Region			
Central (Central 1, Central 2, Kampala)	Reference	Reference	Reference
Eastern (Bugishu, Bukedi, Busoga)	**1.04 [1.03, 1.05]**	**0.72 [0.67, 0.76]**	**1.11 [1.05, 1.18]**
Northern (Acholi, Lango, Teso, Karamoja, West Nile,)	**0.94 [0.93, 0.95]**	**0.86 [0.81, 0.91]**	**0.93 [0.88, 0.99]**
Western (Bunyoro, Tooro, Ankole, Kigezi)	**0.93 [0.92, 0.94]**	**0.53 [0.49, 0.56]**	1.04 [0.99, 1.11]

Place of residence			
Urban	Reference	Reference	Reference
Rural	**1.07 [1.06, 1.08]**	**1.08 [1.01, 1.14]**	**1.12 [1.06, 1.19]**
Highest level of education			
No education	Reference	Reference	Reference
Primary	**0.94 [0.93, 0.95]**	1.01 [0.96, 1.07]	**1.61 [1.52, 1.70]**
Secondary	**0.77 [0.76, 0.78]**	**0.78 [0.72, 0.85]**	**1.59 [1.48, 1.72]**
Higher education	**0.61 [0.59, 0.62]**	**0.79 [0.69, 0.89]**	**1.78 [1.60, 1.99]**
Literacy			
Illiterate (Cannot read at all)	Reference	Reference	Reference
Literate (Can at least read)	**0.92 [0.91, 0.93]**	**0.93 [0.89, 0.98]**	**1.12 [1.07, 1.17]**
Wealth quintile			
Poorest	Reference	Reference	Reference
Poorer	0.99 [0.98, 1.01]	**1.07 [1.01, 1.14]**	**1.38 [1.30, 1.46]**
Middle	1.01 [0.99, 1.01]	**1.18 [1.10, 1.25]**	**1.66 [1.56, 1.76]**
Richer	1.00 [0.98, 1.01]	**1.26 [1.18, 1.35]**	**2.03 [1.91, 2.16]**
Richest	**0.89 [0.87, 0.91]**	**1.25 [1.15, 1.36]**	**2.08 [1.92, 2.26]**
Health insurance coverage			
Not covered	Reference	Reference	Reference
Covered	**1.04 [1.01, 1.07]**	0.91 [0.75, 1.09]	1.11 [0.94, 1.29]
Occupation			

Not working	Reference	Reference	Reference
Domestic and household work	**0.87 [0.83, 0.91]**	**0.65 [0.52, 0.82]**	1.07 [0.89, 1.28]
Paid work	0.99 [0.98, 1.01]	**1.08 [1.02, 1.14]**	**1.17 [1.11, 1.23]**

Discussion

The study revealed four distinct sequences of events in Ugandan women's reproductive trajectories: marriage, sex, birth; sex, birth, marriage; sex, marriage, birth; and sex, birth (no marriage), showing variations in the timing of events. Additionally, the study emphasized how common premarital sex is by the age of 16. There are several interrelated reasons why underage premarital sex is common. Teenage premarital sex activity may be caused by inadequate sex education, peer pressure, and cultural norms supporting early marriage and childbearing (Amongin et al., 2020). Gender inequality can result in coercion or limited agency in sexual decision-making, while economic vulnerabilities such as poverty and limited opportunities can push young girls and women to exchange sex for basic needs. Cultural customs that encourage girls to marry young people worsen the problem. Influence from the media and barriers to accessing services related to sexual and reproductive health also matter.

The average age at which people get married is 17, and births happen within a year after that. Certain communities' cultural norms and traditions may place a high value on early marriage as a social requirement or expectation, especially for girls. Furthermore, the timing of childbirth soon after marriage may be influenced by social pressures or expectations regarding fertility and reproduction within the context of marriage (Alazbih et al., 2023).

According to the study, sequences with marriage typically have an average CEB that is higher than sequences without marriage. Marriage may be influenced by cultural norms, familial expectations, or a person's own desire to have children and take on the responsibilities of traditional parents. Married couples may also have easier access to resources and support networks, which can ease the decision to have children (Alazbih et al., 2023). Social networks, financial security, and availability to medical services that assist with prenatal and postpartum care are a few examples of this. Furthermore, because of aspects like inheritance rights, social standing, and cultural views on lineage and family continuity, couples in legally recognized marriages might have greater social and legal incentives to procreate. The institution of marriage can, in general, be a major predictor of fertility behavior, resulting in higher average CEB within marriage-related sequences.

There are a number of reasons for the higher rates of pregnancy termination experienced in later years among women in sequences involving marriage, i.e. early marriage. Early marriage and childbearing are frequently associated, which may raise the risk of pregnancy-related problems or unplanned pregnancies because of inadequate knowledge about family planning and contraception (Fan and Koski, 2022). Furthermore, women who marry young might experience more social and financial pressures, which could limit their capacity to provide for a child or force them to put off having children until they are better ready. Women may experience changes in their reproductive health as they get older in the context of marriage, such as lower fertility, higher chances of miscarriage, or illnesses that require pregnancy termination for the mother's health (Ibisomi and Odimegwu, 2010). The risks of later pregnancy termination may also be increased by cultural expectations and conventions surrounding early marriage, which may maintain a cycle of low economic and educational opportunities for women.

There could be a number of reasons for the observed higher chance of contraceptive use among women in early marriage sequences as opposed to sequences without marriage. First of all, getting married young may compel a person to dedicate more time to their partner and their family goals, which may lead to couples actively planning and spacing out their pregnancies with contraceptives (Namasivayam et al., 2019).

Furthermore, through antenatal care or family planning programs, women in young marriages may have easier access to reproductive health information and services, which will eventually make it easier for them to acquire and use contraceptives later in life (Andi et al., 2014).

Conclusion and recommendations

In summary, this study illuminates the dynamics of reproductive behavior in Ugandan women by identifying specific life event sequences and their consequences for fertility and reproductive health outcomes. The results highlight how common it is to engage in sexual activity prior to marriage, get married young, and have children soon after. Crucially, marriage-related sequences are linked to increased fertility and contraceptive use, emphasizing the impact of marital status on reproductive decision-making. Early marriage, however, is also associated with higher rates of pregnancy termination in later life, indicating the difficulties and hazards women encounter in juggling early childbearing with social expectations.

Longitudinal studies are required to track women's reproductive paths over time right from adolescence. Monitoring their lifetime progress toward important reproductive health metrics is recommended so as to assess the efficacy of programs meant to enhance reproductive health outcomes and empower women and girls.

It is also necessary to investigate how socioeconomic factors interact to affect early marriage and childbearing and to evaluate successful comprehensive sex education programs. In addition, policies put in place to enhance age-appropriate education for young girls and women about sex, marriage, and childbirth must be strengthened

Limitation

Recall bias may have occurred because the study used data from a cross-sectional study in which self-reported ages at first birth, marriage, and sex were recorded. Therefore, more longitudinal studies that enroll and follow up girls before their first marriage, sex, and birth up until their adult lives are needed to supplement the findings from this study and understand their reproductive behaviors of women.

References

Alazbih, N.M., Kaya, A.H., Mengistu, M.Y., Gelaye, K.A., 2023. Determinants of time to first marriage and birth intervals among women of child bearing age in Dabat Health and demographic surveillance system site, Northwest Ethiopia. PLOS ONE 18, e0281997. https://doi.org/10.1371/journal.pone.0281997

Amongin, D., Nakimuli, A., Hanson, C., Nakafeero, M., Kaharuza, F., Atuyambe, L., Benova, L., 2020. Time trends in and factors associated with repeat adolescent birth in Uganda: Analysis of six demographic and health surveys. PLOS ONE 15, e0231557. https://doi.org/10.1371/journal.pone.0231557

Andi, J.R., Wamala, R., Ocaya, B., Kabagenyi, A., 2014. Modern contraceptive use among women in Uganda: An analysis of trend and patterns (1995-2011). Afr. Popul. Stud. 28, 1009. https://doi.org/10.11564/28-0-553

Ariho, P., Kabagenyi, A., 2020. Age at first marriage, age at first sex, family size preferences, contraception and change in fertility among women in Uganda: analysis of the 2006–2016 period. BMC Womens Health 20. https://doi.org/10.1186/s12905-020-0881-4

Ariho, P., Kabagenyi, A., Nzabona, A., 2018. Determinants of change in fertility pattern among women in Uganda during the period 2006–2011. Fertil. Res. Pract. 4. https://doi.org/10.1186/s40738-018-0049-1

Fan, S., Koski, A., 2022. The health consequences of child marriage: a systematic review of the evidence. BMC Public Health 22. https://doi.org/10.1186/s12889-022-12707-x

Ibisomi, L., Odimegwu, C., 2010. Pregnancy termination in sub-Saharan Africa: the need for refined data. Int. J. Health Res. 1. https://doi.org/10.4314/ijhr.v1i4.55378

Meherali, S., Rehmani, M., Ali, S., Lassi, Z.S., 2021. Interventions and Strategies to Improve Sexual and Reproductive Health Outcomes among Adolescents Living in Low- and Middle-Income Countries: A Systematic Review and Meta-Analysis. Adolescents 1, 363–390. https://doi.org/10.3390/adolescents1030028

Melesse, D.Y., Cane, R.M., Mangombe, A., Ijadunola, M.Y., Manu, A., Bamgboye, E., Mohiddin, A., Kananura, R.M., Akwara, E., Du Plessis, E., Wado, Y.D., Mutua, M.K., Mekonnen, W., Faye, C.M., Neal, S., Boerma, T., 2021. Inequalities in early marriage, childbearing and sexual debut among adolescents in sub-Saharan Africa. Reprod. Health 18. https://doi.org/10.1186/s12978-021-01125-8

Mwebesa, E., Nakafeero, M., Guwatudde, D., Mbona Tumwesigye, N., 2022. Application of a modified Poisson model in identifying factors associated with prevalence of pregnancy termination among women aged 15 – 49 years in Uganda. Afr. Health Sci. 22, 100–107. https://doi.org/10.4314/ahs.v22i3.12

Nalwanga, R., Nuwamanya, E., Nuwasiima, A., Babigumira, J.U., Asiimwe, F.T., Babigumira, J.B., 2021. Utilization of a mobile phone application to increase access to sexual and reproductive health information, goods, and services among university students in Uganda. Reprod. Health 18. https://doi.org/10.1186/s12978-020-01037-z

Namasivayam, A., Lovell, S., Namutamba, S., Schluter, P.J., 2019. Improved contraceptive use among women and men in Uganda between 1995-2016: A repeated cross-sectional population study. PLOS ONE 14, e0219963. https://doi.org/10.1371/journal.pone.0219963

Navideh Noori, Joshua L Proctor, Yvette Efevbera, Assaf P Oron, 2022. The Effect of Adolescent Pregnancy on Child Mortality in 46 Low- and Middle-Income Countries. BMJ Glob. Health 7, e007681. https://doi.org/10.1136/bmjgh-2021-007681

Ninsiima, L.R., Chiumia, I.K., Ndejjo, R., 2021. Factors influencing access to and utilisation of youth-friendly sexual and reproductive health services in sub-Saharan Africa: a systematic review. Reprod. Health 18. https://doi.org/10.1186/s12978-021-01183-y

Shasha, L., Phiri, M., Namayawa, S., Sikaluzwe, M., Nakazwe, C., Lemba, M., Muhanga, M., 2023. Prevalence and factors associated with early childbearing in sub-saharan Africa: evidence from demographic and health surveys of 31 countries. BMC Womens Health 23. https://doi.org/10.1186/s12905-023-02581-z

Usonwu, I., Ahmad, R., Curtis-Tyler, K., 2021. Parent–adolescent communication on adolescent sexual and reproductive health in sub-Saharan Africa: a qualitative review and thematic synthesis. Reprod. Health 18. https://doi.org/10.1186/s12978-021-01246-0