

Exploring Contemporary Issues of Adolescent Pregnancies in Kenya: Further Analysis Of 2014 And 2020 Kenya Demographic and Health Survey Datasets Files

Calvince Anino¹, Joel Wanzala¹, Fredrik Wanyama¹, Collins Kirui¹

¹ University of Kabianga : abbysansiojoel@gmail.com

ABSTRACT

Background

Adolescent pregnancy is a pressing issue with significant social and health consequences for both mothers and children, particularly in developing countries with limited access to quality healthcare. Despite policy and program interventions, adolescent pregnancies continue to have adverse outcomes. The examined trends and contemporary issues related to adolescent pregnancies in Kenya using data from the 2014 and 2020 Kenya Demographic and Health Survey datasets files.

Methods

Kenya Demographic and Health Survey datasets for 2014 and 2020 were used. Descriptive statistics were used to analyze trends in adolescent pregnancies, while binary logistic regression analysis was used to identify factors associated with adolescent pregnancies.

Results

The study found a significant decrease in the prevalence of adolescent pregnancies from 18.8% in 2014 to 12.2% in 2020 ($p < 0.001$), with a higher prevalence in rural areas. Over 70% of the pregnancies were unintended, and sexual initiation before the age of 15 was associated with a higher risk of pregnancy. Wealth status, education, access to healthcare, and household size were significantly associated with adolescent pregnancy.

Conclusion

The study observed a concerning rise in adolescent pregnancies, primarily affecting girls aged 15–19. This was driven by the interplay of socio-demographic, economic, and cultural factors, which greatly impacted rural and disadvantaged communities.

Keywords:

Copyright © 2024 The Author(s): This is an open-access article distributed under the terms of the Creative Commons **Attribution 4.0 International License (CC BY-NC 4.0)** which permits unrestricted use, distribution, and reproduction in any medium for non-commercial use provided the original author and source are credited.

1.0 INTRODUCTION

Adolescent reproductive health has garnered growing attention at local, regional, and international levels in recent years. It occurs among girls aged between 10 and 19 years and is one of the leading reproductive health issues among adolescent girls (WHO, 2018). Adolescent pregnancy is reported to cause adverse impacts on the socio-economic attributes of a population. Additionally, it is associated with significant and adverse social and health consequences for both the mother and child. They include stigmatization, education dropout, and increased risk of maternal mortality, among other short- and long-term effects, especially in developing countries. The low socio-economic population with limited access to quality maternal and child healthcare and facilities were reported to be at a greater risk (Rosengard, 2012).

According to Kons et al. (2022), the global average number of adolescent girls who became pregnant in 2021 and 2022 was 12 million. The highest rates of adolescent pregnancies were observed in Sub-Saharan Africa and South Asia, while North America and Europe had the lowest rates (Mulunga et al., 2023; Okoli et al., 2022). Despite historically low rates, there has been an increase in adolescent pregnancies in some countries, including the United States of America where the rate rose from 17.4 to 17.7 births per 1,000 adolescent girls. Rosengard (2012) noted that adolescent pregnancy rates vary widely across regions, countries, and individuals, as it is

influenced by numerous factors. The majority of adolescent births occur in developing countries, especially in Africa and Asia, with Sub-Saharan Africa having the highest rate at about 99 per 1,000 adolescent girls aged 15–19 years (Mulunga et al., 2023). Studies have shown an increase in the prevalence of teenage pregnancy among girls under 18 from 3.3% in 2003 to 5% in 2013, with age-specific fertility rates of 10% among 16-year-old girls, particularly in Sub-Saharan Africa (Adane et al., 2020; Lambonmum et al., 2022). On average, East African countries have a teenage pregnancy prevalence of 21%, with the highest prevalence being in Mozambique at 35.72% and the lowest in Rwanda at 3.53% (Kons et al., 2022; Mamo, 2021).

In Kenya, reports from the National Council for Population and Development (NCPD) (2020) indicated increase in adolescent pregnancy rates from 92 per 1000 in 2015 to about 96 per 1000 adolescent girls in 2019. Additionally, a report from UNFPA (2013) found that about 378,400 adolescent girls aged 10–19 years were pregnant between from July 2016 to the close of that year, with approximately 8% of them being aged between 10 and 14 years. Adolescent pregnancy prevalence escalated from mid-2020, reaching about 40% of the country's monthly average in different regions of the country, attributed to various contemporary issues such as the COVID-19 pandemic (KHIS, 2023). The COVID-19 pandemic's impact on trends of adolescent pregnancy was not only a major contemporary issue in Kenya but globally. The pandemic compromised health systems

globally, limiting reproductive health services such as contraceptive utilization, resulting in increased pregnancy rates in various countries.

Persistently high rates of adolescent pregnancies remain a greater challenge in many countries, especially Kenya, despite various interventions aimed at reduction or prevention of adolescent pregnancy implemented in Kenya. Adolescent pregnancy has also been associated with other contemporary issues such as limited access to reproductive health services and cultural beliefs and practices that impact the trends of adolescent pregnancy in various countries and regions. Thus, there is a need for further exploration of these contemporary trends and issues to develop effective interventions to reduce or prevent adolescent pregnancies.

2.0 METHODS

2.1 Study Site

The data utilized in this study was extracted from the Kenya Demographic and Health Survey (KDHS) datasets of 2014 and 2020. These datasets were developed from the demographic health survey conducted in 2022 by the Kenya National Bureau of Statistics (KNBS) and the Ministry of Health (MOH). The datasets which are hosted in the KDHS platform were obtained with legal permission. KDHS surveys have been conducted in over 90 countries worldwide since 1984 and are cross-sectional studies that provide nationally representative household surveys. In Kenya, KDHS surveys have been conducted every five years since 1989. The study sample comprised 2,512 adolescent girls, with 1,080 and 1,432 participants from the 2014 and 2020 KDHS datasets, respectively. The primary objective of the KDHS surveys is to provide comprehensive information on health and demographic indicators, including reproductive health, fertility, nutrition, maternal and child health, mortality, and self-reported health behaviors among adults. These surveys are characterized by high response rates, national coverage, and standardized data collection procedures across the country, as well as consistent content over time. The study's data was extracted from the KDHS adolescent girls' dataset, which contains information on the reproductive health of girls aged 15-19 years.

2.2 Variables

The dependent variable was adolescent pregnancy, which was measured as a dichotomous variable indicating whether adolescent girls had ever been pregnant or not. Response options were "Yes" or "No," and prevalence and trends were assessed in relation to previous KDHS data. The independent

variables included socio-demographic and sexual/reproductive health-related factors. Socio-demographic factors such as age, education and marital status were assessed. Age was measured as a continuous variable in years. Education level was a categorical variable with six categories: no education, incomplete primary education, complete primary education, incomplete secondary education, complete secondary education, and higher education. Marital status was a dichotomous variable indicating whether the adolescent girl was married or not at the time of KDHS data collection. Place of residence was a categorical variable representing whether the adolescent girl lived in an urban or rural area. Sexual and reproductive health-related factors included age at first sexual intercourse, which was measured as a continuous variable representing age in years.

2.3 Statistical analysis

The statistical analysis was performed using Statistical Package for Social Sciences (SPSS) version 20.0. To analyze the prevalence in adolescent pregnancies and sample characteristics from the 2014 and 2020 KDHS datasets files in Kenya, descriptive statistics, particularly percentages and mean were employed. Furthermore, binary logistic regression analysis was conducted to estimate the odds ratios of factors associated with adolescent pregnancies. All statistical tests were two-tailed with a 95% confidence interval (CI), and a *p*-value below 0.05 was deemed statistically significant.

2.4 Ethical consideration

Permission was sought from the DHS Program by the author in order to access the data sets. During DHS data collection, the approval was sought from the respondents and the data were coded in a such a manner to ensure privacy and to hide identity of the respondents. Furthermore, KDHS data obtained from DHS program were treated with high confidentiality.

3.0 RESULTS

A total of 2512 adolescent girls aged 15–19 years were included. Table 1 describes the sociodemographic characteristics of adolescent girls aged 15–19 in 2014 and 2020 KDHS data sets. It shows that majority of adolescent girls were aged 19 years and had attained incomplete primary level of education (for 2014 KDHS) while majority with incomplete secondary level (for 2020 KDHS), were protestant/other Christian, from the rural areas and poorest wealth quintile.

Table 1: Socio-demographic characteristics of adolescent girls in based on 2014 and 2020 KDHS

Socio-demographic	2014 (N= 1,080)		2020 (N= 1,432)	
	Number	Percentage (%)	Number (n)	Percentage (%)
Age				
15	25	2.3	331	23.1
16	71	6.6	348	24.3
17	136	12.6	285	19.9
18	331	30.6	277	19.3
19	517	47.9	191	13.3

Education Level				
No education	107	9.9	40	2.8
Incomplete primary	453	41.9	250	17.5
Complete primary	273	25.3	206	14.4
Incomplete Secondary	184	17.0	786	54.9
Complete Secondary	58	5.4	126	8.8
Higher	5	0.5	24	1.7
Religion				
Roman Catholic	215	19.9	214	14.9
Protestant/Other Christian	672	62.4	1,040	72.6
Muslim	158	14.6	165	11.5
No Religion	32	3.0	10	0.7
Other e.g., traditional	2	0.2	3	0.2
Residence				
Urban	31.7	31.7	555	38.8
Rural	738	68.3	877	61.2
Wealth Quintile				
Poorest	384	35.6	338	23.6
Poorer	229	21.2	333	23.3
Middle	231	21.4	285	19.9
Richer	151	14.0	286	20.0
Richest	85	7.9	190	13.3
Total	1080	100	1432	100

Table 2, outlines the prevalence and percentage of adolescent girls that have experienced pregnancy. The prevalence of adolescent pregnancy among girls aged 15-19 years decreased from 18.0% in 2014 to approximately 12.2% ($p < 0.001$) in 2020. In 2014, the majority of adolescent girls experienced pregnancy at

the age of 16 years (36.6%) followed by those aged 17 years (24.3%), 15 years (20%), 18 years (17.8%) while lowest among those who aged 18 years (17.0%). In 2022, the prevalence was highest among those aged 19 years (36.3%) and lowest among those aged 15 years (1.2%).

Table 2: Percentage of adolescent girls aged 15-19 years who were pregnant 2014 and 2020

	2014 (N = 1,080)		2020 (N = 1,432)	
	Experienced Pregnancy (N)	Percentage (%)	Experienced Pregnancy (N)	Percentage (%)
Age				
15	5	20	4	1.2
16	26	36.6	20	5.7
17	33	24.3	29	10.2
18	59	17.8	52	18.8
19	88	17.0	70	36.6
	201	18.6	175	12.2

The study conducted a binary logistic regression analysis of socio-demographic characteristics for adolescent girls aged 15-19 years who experienced pregnancy during adolescence in 2014 and 2020 as shown in Table 3. The factors or issues related to adolescent pregnancy were analyzed and compared between the two data sets. The results indicated that age, level of education, place of residence, wealth quintile, and sexual initiation age were significantly associated with adolescent pregnancy. In 2014, adolescent women aged 16 were almost twice as likely to experience pregnancy compared to those aged 19, but this was statistically insignificant. However, the odds of experiencing pregnancy increased with age, and those aged 17 and 18 were significantly less likely to be pregnant compared to the reference category ($p = 0.039$ and 0.004 respectively). In 2020, the odds increased significantly with the age of adolescent girls, and those aged 15 years ($p = 0.007$, $CI = 0.037-0.592$, $OR = 0.149$) were less likely to experience pregnancy, followed by those aged 16, 17, and 18 years. The study also found that those with lower educational

attainment had higher odds of adolescent pregnancy in both years, with incomplete primary, incomplete secondary, and complete secondary educational levels being significantly associated with adolescent pregnancy. The results showed no significant difference in the odds of adolescent pregnancy between religion categories, although those who were Protestant or other Christians had higher odds. Those living in rural areas had significantly higher odds of adolescent pregnancy ($p = 0.001$, $OR = 1.47$, $CI = 1.046-3.693$ in 2014 and $p = 0.002$, $OR = 1.14$, $CI = 1.014-3.528$ in 2020) compared to those living in urban areas in both years. The odds of adolescent pregnancy were inversely associated with wealth status, with the poorest, middle, and richest wealth quintiles being significantly associated with adolescent pregnancy. Sexual initiation age was significantly associated with adolescent pregnancy, with those engaging in sexual intercourse before the age of 15 having a higher risk of pregnancy compared to those who engaged in sexual intercourse at an age above 15 years.

Table 3: Regression analysis of socio-demographic characteristics for adolescent girls aged 15–19 years who experienced pregnancy during adolescence in 2014 and 2020

		2014 (N=1,080)			2020 (N= 1,432)		
		OR	CI 95%	p-value	OR	CI 95%	p-value
Age							
	15	0.000	0.000	0.998	0.149	0.037-0.592	0.007
	16	1.667	0.223-2.634	0.673	0.160	0.041-0.633	0.009
	17	0.789	0.038-0.925	0.039	0.281	0.079-0.999	0.050
	18	0.930	0.291-0.985	0.004	0.797	0.471-2.820	0.644
	19	ref	ref	ref	ref	ref	ref
Education Level							
	No education	ref	ref	ref	ref	ref	ref
	Incomplete primary	0.468	0.222-0.987	0.046	0.150	0.033-0.676	0.013
	Complete primary	0.366	0.153-0.873	0.024	0.326	0.102-1.046	0.060
	Incomplete Secondary	0.102	0.029-0.863	0.000	0.134	0.044-0.404	0.000
	Complete Secondary	0.085	0.010-0.717	0.024	0.070	0.013-0.380	0.002
	Higher	0.000	0.000	0.999	0.000	0.000	0.998
Religion							
	Roman Catholic	ref	ref	ref	ref	ref	ref
	Protestant/Other Christian	1.132	0.589-2.176	0.710	2.282	0.525-9.921	0.271
	Muslim	0.666	0.278-1.599	0.363	0.230	0.018-2.968	0.260
	No Religion	0.770	0.190-3.115	0.713	2.591	0.153-43.774	0.509
Residence							
	Urban	ref	ref	ref	ref	ref	ref
	Rural	1.417	1.046-3.693	0.001	1.140	1.014-3.528	0.002
Wealth Index							
	Poorest	ref	ref	ref	ref	ref	ref
	Poorer	0.911	0.032-0.966	0.012	0.924	0.659-0.986	0.023
	Middle	0.892	0.459-0.912	0.022	0.729	0.183-0.841	0.039
	Richer	0.608	0.439-1.877	0.794	0.492	0.093-2.605	0.404
	Richest	0.493	0.126-0.743	0.032	0.251	0.124-0.907	0.001
Sexual Initiation							
	Below 15 Years	3.15	2.54-3.92	0.001	2.18	1.78-2.67	0.001
	15 years and above	ref	ref	ref	ref	ref	ref

ref-Reference Category

OR-Odds Ratio

4.0 DISCUSSION

Adolescent pregnancy is a significant public health issue in Kenya and globally, as it has adverse impact on adolescent women and their children's health, as well as other socio-economic consequences (Beguy et al., 2014; Diabelková et al., 2023). Although there was a significant reduction in the prevalence of adolescent pregnancy from approximately 18.6% in 2014 to 12.2% in 2015, the 2019 Kenya Population and Housing Census revealed that the prevalence among adolescent girls aged 15-19 years who had begun childbearing had increased to 21% (KDHS, 2014; KDHS, 2022). The adolescent pregnancy rate in Kenya is similar to that in Tanzania (18%), higher than that in Rwanda (9%), and lower than that in Uganda (19%) (TDHS, 2022; UDHS, 2022; Omoro et al., 2018). Various issues, including socio-demographic factors, economic factors, cultural factors, and limited access to reproductive health services, among others, influence the high prevalence of adolescent pregnancy in Kenya (Omoro et al., 2018). The Adolescent Reproductive Health and Development Policy of 2013 outlined unequitable implementation and limited dissemination of the policy to all adolescents in society and widely in Kenya (UNFPA, 2013). The COVID-19 pandemic has further exacerbated the issue of adolescent pregnancy, with a 40% increase in the rate reported in various regions of Kenya from mid-2020 (KHIS, 2023). Lockdowns and compromised healthcare systems affected

access to reproductive health services, leading to reduced utilization of modern contraceptives, which significantly increases the risk of unintended pregnancies. Counties such as Samburu, Nyamira, Tana River, and West Pokot have reported the highest incidence of early childbearing, with over 25% each (County government of Samburu, 2018).

The findings of our regression analysis indicate that adolescent pregnancy is associated with various factors, such as age, educational attainment, wealth quintile, place of residence, and early sexual initiation. These findings are consistent with those of previous studies (Malunga et al., 2023; Diabelková et al., 2023), highlighting the need for effective interventions to reduce adolescent pregnancy rates. Our study found that the age of adolescent girls was significantly associated with adolescent pregnancy, and the risk varied across time or years. In 2014, adolescent girls aged 16 years had almost twice the risk of pregnancy compared to those aged 19 years. Similar findings were reported in a study conducted by Were (2007) and a 2020 study by Campos et al. (2015). These results suggested that interventions aimed at reducing adolescent pregnancy should target younger adolescents to achieve better outcomes at higher adolescent ages. Our study also found a strong association between educational attainment and adolescent pregnancy, with the lowest educational level being strongly associated with a

higher risk of adolescent pregnancy. This finding is consistent with previous studies (Mamo et al., 2021; Ganchimeg et al., 2014) and highlights the need for interventions that address issues such as limited knowledge about sexual and reproductive health, limited access to modern contraception, and poor decision-making that contribute to unintended adolescent pregnancy. Adolescent pregnancy often leads to school dropout, limiting girls' access to education and compromising their future employment opportunities, perpetuating the cycle of poverty. Our study and previous research by Mulunga et al. (2023) showed that adolescent pregnancy among school-aged girls is attributed approximately 10–30% to school dropout and early marriages, with increased incidence during the COVID-19 pandemic in Kenya. Furthermore, adolescent mothers and children often have poor health outcomes that have long-term impacts on their psychological, cognitive, and physical development. Our findings also revealed that adolescent girls living in rural areas had a higher prevalence of adolescent pregnancy compared to those in urban areas, which is consistent with previous survey data from Kenya (KDHS, 2022). This might be attributed to the limited access to sexual and reproductive health services in rural areas. Additionally, the wealth quintile was inversely associated with adolescent pregnancy in both 2014 and 2022. Adolescent girls from the poorer quintile were at a higher risk of adolescent pregnancy compared to those from the richer quintile, which is consistent with previous studies (Ganchimeg et al., 2014; Kons et al., 2022). Furthermore, the study found that the association between the wealth index and adolescent pregnancy differed across various wealth index categories, indicating that addressing poverty and promoting economic development might be effective efforts in reducing adolescent pregnancy in Kenya. Further, sexual initiation was strongly associated with adolescent pregnancy, and adolescent girls who had their sexual debut below the age of 15 were at a higher risk of adolescent pregnancy in both 2014 and 2022. This finding is consistent with previous studies (Beguy et al. 2014; KDHS, 2022; TDHS, 2022) and might be due to factors such as engaging in transactional sex or sexual relationships with older men, inadequate access to sexual and reproductive health facilities and services, and socio-cultural norms and beliefs that value early marriages and childbearing. Early sexual initiation was also associated with a higher risk of unintended pregnancy due to the lower likelihood of adolescent girls using modern contraceptives consistently and correctly.

Addressing adolescent pregnancy and early sexual initiation requires comprehensive approaches and strategies that involve education and improvement in access to sexual and reproductive health services and facilities. Our study findings support the efforts made towards the achievement of United Nations Sustainable Development Goal 5, which outlines gender equality and addresses socio-cultural norms and beliefs. In conclusion, our study provides valuable information that can be used to develop targeted interventions aimed at reducing adolescent pregnancy in Kenya, especially among those living in rural areas and from the poorest wealth quintile.

4.0 CONCLUSION

While there was a notable reduction in adolescent pregnancy rates, the recent data demonstrates a worrisome increase, particularly among girls aged 15–19 years who have started childbearing. Socio-demographic, economic, and cultural factors intersect to drive this issue, impacting rural areas and

economically disadvantaged groups disproportionately. Regression analysis underscores the role of age, education, wealth, residence, and early sexual initiation as key determinants. To effectively address this complex challenge, comprehensive strategies are needed, integrating education, improved access to reproductive health services, and shifts in cultural norms, aligning with the goal of gender equality outlined in the UN Sustainable Development Goals.

REFERENCES

- [1] Adane, F., Afework, M., Seyoum, G., & Gebrie, A. (2020). Prevalence and associated factors of birth defects among newborns in sub-Saharan African countries: a systematic review and meta-analysis. *Pan African Medical Journal*, 36(1).
- [2] Beguy, D., Mumah, J., & Gottschalk, L. (2014). Unintended pregnancies among young women living in urban slums: evidence from a prospective study in Nairobi city, Kenya. *PLoS one*, 9(7), e101034.
- [3] Campos, A. C. V., Albala, C., Lera, L., Sánchez, H., & Vargas, A. M. D. (2015). Gender differences in predictors of self-rated health among older adults in Brazil and Chile. *BMC public health*, 15(1), 1–11.
- [4] Centers for Disease Control and Prevention. (2021). Teen Pregnancy. Retrieved from <https://www.cdc.gov/teenpregnancy/index.htm>
- [5] County Government of Samburu. (2018). *SMART Survey Report*. Retrieved from [Samburu County SMART Survey Report – June 2018 – Samburu County Government](#)
- [6] Diabelková, J., Rimárová, K., Dorko, E., Urdzík, P., Houžvičková, A., & Argalášová, Ľ. (2023). Adolescent pregnancy outcomes and risk factors. *International Journal of Environmental Research and Public Health*, 20(5), 4113.
- [7] Ganchimeg, T., Ota, E., Morisaki, N., Laopaiboon, M., Lumbiganon, P., Zhang, J., ... & WHO Multicountry Survey on Maternal Newborn Health Research Network. (2014). Pregnancy and childbirth outcomes among adolescent mothers: a World Health Organization multicountry study. *BJOG: An International Journal of Obstetrics & Gynaecology*, 121, 40–48.
- [8] KDHS. (2014). Kenya Demographic and Health Survey. Kenya National Bureau of Statistics. Retrieved from <https://www.knbs.or.ke/?wpdmprom=kenya-demographic-and-health-survey-2014>
- [9] KDHS. (2022). Kenya Demographic and Health Survey. Kenya National Bureau of Statistics. Retrieved from <https://www.knbs.or.ke/?wpdmprom=kenya-demographic-and-health-survey-2022>
- [10] Kenya Health Information System (2023). Health information annual reports and bulletin. Retrieved from [KHIS Aggregate \(hiskenya.org\)](https://www.khis.or.ke/)
- [11] Kenya Health Information System (KHIS). (2020). Adolescent Sexual and Reproductive Health Data. Retrieved from <https://hiskenya.org/adolescent-sexual-and-reproductive-health-data>
- [12] Kenya National Bureau of Statistics (KNBS) (2019). 2019 Kenya population and housing census

- reports. Retrieved from [2019 Kenya Population and Housing Census Reports - Kenya National Bureau of Statistics \(knbs.or.ke\)](#)
- [13] Kons, K., Biney, A. A., & Sznajder, K. (2022). Factors associated with adolescent pregnancy in sub-Saharan Africa during the COVID-19 pandemic: a review of socioeconomic influences and essential interventions. *International Journal of Sexual Health*, 34(3), 386-396.
 - [14] Lambonmung, A., Acheampong, C. A., & Langkulsen, U. (2022). The Effects of Pregnancy: A Systematic Review of Adolescent Pregnancy in Ghana, Liberia, and Nigeria. *International Journal of Environmental Research and Public Health*, 20(1), 605.
 - [15] Malunga, G., Sangong, S., Saah, F. I., & Bain, L. E. (2023). Prevalence and factors associated with adolescent pregnancies in Zambia: a systematic review from 2000–2022. *Archives of Public Health*, 81(1), 27.
 - [16] Mamo, K., Siyoum, M., & Birhanu, A. (2021). Teenage pregnancy and associated factors in Ethiopia: a systematic review and meta-analysis. *International Journal of Adolescence and Youth*, 26(1), 501-512.
 - [17] Mutea, L., Were, V., Ontiri, S., Michielsen, K., & Gichangi, P. (2022). Trends and determinants of adolescent pregnancy: Results from Kenya demographic health surveys 2003–2014. *BMC Women's Health*, 22(1), 416.
 - [18] Okoli, C. I., Hajizadeh, M., Rahman, M. M., Velayutham, E., & Khanam, R. (2022). Socioeconomic inequalities in teenage pregnancy in Nigeria: evidence from Demographic Health Survey. *BMC Public Health*, 22(1), 1-11.
 - [19] Omoro, T., Gray, S. C., Otieno, G., Mbede, C., Phillips-Howard, P. A., Hayes, T., ... & Gust, D. A. (2018). Teen pregnancy in rural western Kenya: a public health issue. *International Journal of Adolescence and Youth*, 23(4), 399-408.
 - [20] Rosengard, C., Tannis, C., Dove, D. C., Van Den Berg, J. J., Lopez, R., Stein, L. A. R., & Morrow, K. M. (2012). Family sources of sexual health information, primary messages, and sexual behavior of at-risk, urban adolescents. *American journal of health education*, 43(2), 83-92.
 - [21] TDHS (2022). Tanzania demographic health survey report. Tanzania National Bureau of Statistics. Retrieved from [National Bureau of Statistics - DHS 2022 Key Indicators Report \(nbs.go.tz\)](#)
 - [22] UDHS. (2023). Uganda demographic and health survey. Uganda National Bureau of Statistics. [The Uganda Demographic And Health Survey - Uganda Bureau of Statistics \(ubos.org\)](#)
 - [23] UNFPA. (2013). Adolescent pregnancy: A review of the evidence. Retrieved from [https://www.unfpa.org/sites/default/files/pubpdf/ADOLESCENT%20PREGNANCY UNFPA.pdf](https://www.unfpa.org/sites/default/files/pubpdf/ADOLESCENT%20PREGNANCY%20UNFPA.pdf)
 - [24] Were, M. (2007). Determinants of teenage pregnancies: The case of Busia District in Kenya. *Economics & Human Biology*, 5(2), 322-339.
 - [25] World Health Organization. (2018). Adolescent pregnancy fact sheet. Retrieved from <https://www.who.int/news-room/fact-sheets/detail/adolescent-pregnancy>