



College of Medicine and Health Sciences

School of Public Health

Early sexual debut and subsequent risk factors among youth in Rwanda: A secondary data analysis of Rwanda Demographic and Health Survey 2015

A dissertation submitted in partial fulfillment of the requirements for the award of a Masters in Field Epidemiology

By Justine UMUTESI

Supervisor: Prof Joseph NTAGANIRA

Co-supervisor: Dr Francine BIRUNGI

November, 2016

Acknowledgements

I would like to first acknowledge my supervisors who sacrificed their time to bring this study to successful completion.

I deeply appreciate the Government of Rwanda for the support that enabled me to undertake this Master's program.

To the authorities of the Rwanda Biomedical Center and my colleagues working there and my warm thanks go to my classmates, FELTP residents at School of Public Health for their support and encouragement.

May Mrs. Bryony Simmons find my sincere appreciation for her great data analysis support and advice.

I cannot help express my deep gratitude to my husband Hussein BIDUNDA and my children who, despite my overloaded schedule, supported and encouraged me all along my studies.

May my mother, brothers, sisters and friends find here my sincere appreciation.

Above all, glory be to Almighty God.

List of Acronyms

- AIDS:** Acquired Immuno-Deficiency Syndrome
- DHS:** Demographic Health survey
- FP:** Family Planning
- FSW:** Female Sex workers
- Hinari:** Health Internetwork Access to Research Initiative
- HIV:** Human Immune deficiency Virus
- HPV:** Human papilloma Virus
- ICRP:** Integrated Child Rights Policy
- MIGEPROF:** Ministry of Gender and Family Promotion
- MINALOC:** Ministry of Local Government
- MINEDUC:** Ministry of Education
- MINECOFIN:** Ministry of Finance and Economic Planning
- MINIJUST:** Ministry of Justice
- MOH:** Ministry of Health
- NISR:** National Institute of Statistics in Rwanda
- NGOs:** Non-governmental organization
- NSP:** National Strategic Plan
- OR:** Odd Ratio
- PLHIV:** People Living with HIV
- PID:** Pelvic Inflammatory Disease
- RDHS:** Rwanda Demographic Health survey
- RBC:** Rwanda Biomedical Center
- SIDA:** Syndrome d'Immunodéficience Acquise
- SD:** Standard Deviation
- STIs:** Sexual Transmitted Infections

UNAIDS: United Agency programme of HIV/AIDS

UNFPA: United Nations Population Fund

UNICEF: United Nations Children's Fund

HIV: Human Immunodeficiency Virus

WHO: World Health Organization

Table of Contents

Acknowledgements.....	ii
List of Acronyms.....	iii
Abstract.....	ix
Résumé	x
I. INTRODUCTION.....	1
1.1 Problem statement	2
1.2 Study rationale.....	3
1.3 Objectives.....	4
General Objective	4
Specific Objectives	4
II. LITERATURE REVIEW	5
2.1 Psycho-social factors shape and interact with biology.....	5
2.2 Performance of Sexual and reproductive health for youth in Rwanda	7
2.3 Early sexual initiation among youth.....	8
2.4 Risk factors related to early sexual debut.....	11
2.5 Reproductive health and other problems due to early sexual debut.....	15
2.6 Conceptual framework	16
III. METHODOLOGY	18
3.1 Study design.....	18
3.2 Sampling Methods (RDHS 2015).....	18
3.3 Sample size, population and inclusion criteria	19
3.4 Measurement variables.....	20
1.1 Operational definitions	21
1.2 Ethical considerations.....	22

1.3	Dissemination of results	23
1.4	Data analysis	23
IV.	RESULTS.....	24
4.1	Description of socio-demographics of respondents	24
4.2	Sexual behaviour of youths respondent in RDHS 2015	25
4.3	Sexual debut according to socio-demographic, behaviour and biological factors	25
4.4	Factors associated with early sexual debut among youth in Rwanda	28
A.	Bivariate analysis	28
B.	Multivariate analysis	30
V.	DISCUSSION.....	33
	Strength and limitation of the study.....	37
	Conclusion.....	38
	Recommendation.....	39
	REFERENCES.....	41

List of Figures

Figure 1 Sensitization of youth on HIV/STIs by MOH in 2014	8
Figure 2 Conceptual Framework.....	17
Figure 3 Profile of study population, factors associated with early sexual debut among youth; Rwanda 2016	19

List of Tables

Table 1 Characteristics of youth respondents in RDHS 2015, N=7532.....	24
Table 2 Description of sexual behavior of youth respondents in RDHS 2015, N=7532	25
Table 3 Sexual initiation according to sociodemographic, behavior and biological characteristics, N=3008	26
Table 4 Sexual debut by selected characteristics of the study population	29
Table 5 Multivariate analysis of factors associated with early sexual debut in youth	31

Abstract

Introduction: Initiation of sexual intercourse at an early age is one of the well-known risk factors for Human Immunodeficiency Virus, other Sexually Transmitted Infections and reproductive health problems. We aimed to determine the proportion of early sexual debut before 18 years and explore factors associated with this behavior in youth aged 15-24 years in Rwanda.

Methods: We performed a secondary data analysis using the Rwanda Demographic and Health Survey (RDHS) 2015. We included 7,532 youth aged 15-24 years, who responded in the RDHS 2015 and youth who reported ever having sex were the subject of our interest. We defined early sexual debut as having sex intercourse before 18 years and we statistically tested demographic, behavioral, socio-economic and biological factors to ascertain their association with early sexual debut among our study population. Variables that were significant in the bivariate analysis with a p-value ≤ 0.1 were included in the multivariate logistic regression and we considered final results at a p-value at and ≤ 0.05 .

Results: Overall 3008 (39.9%) of Rwandan youth aged 15-24 years had ever had sex. About 1375 (45.7%) initiated early sexual intercourse (before the age of 18yrs), 726 (37%) had the first sex with their boy/girlfriends. Among youths who had history of sexual debut at an early age, only 19.4% reported using condom. Multivariate analysis showed that among youth aged 15-24 who ever had sex, those aged 20-24 at the time of the survey were less likely to initiate early sexual intercourse (AOR=0.05; 95%CI [0.01-0.18]) compared to youth aged 15-19. Youth who were ever forced to perform unwanted sexual acts were more than three times likely to initiate sexual intercourse earlier, than those who did not (AOR=3.39); 95%CI [1.66-6.92])

Conclusion: Our study indicates that a considerable proportion of youths engage in sexual activity at an early age and practice risky sexual behaviors. Strengthening already implemented policies aiming on fighting against sexual violence especially in youth is needed as well as educating youth on importance of delaying sexual intercourses

Keyword: Early sexual debut, sexual intercourse, associated factors, youth, Rwanda

Résumé

Introduction: Initiation précoce des rapports sexuels est l'un des facteurs de risque bien connus pour l'infection à VIH, les autres Infections Sexuellement Transmissibles et d'autres problèmes liés à la santé de la reproduction. Nous visons à déterminer la proportion des jeunes qui initie précocement (avant 18 ans) les rapports sexuels et à explorer les facteurs associés à ce comportement chez les jeunes âgés de 15 à 24 ans au Rwanda.

Méthodes: Nous avons fait une analyse secondaire de données de l'Enquête Démographique et de Santé conduit en 2015. Nous avons inclus 7,532 jeunes âgés de 15-24 ans et ceux qui ont eu des relations sexuelles étaient des sujets de notre intérêt. Nous avons défini les débuts sexuels précoces comme des rapports sexuels avant 18 ans et nous avons testé statistiquement les facteurs démographiques, comportementaux, socio-économiques et biologiques afin de déterminer leur association avec les débuts sexuels précoces. Les variables qui ont été significatives dans l'analyse bivariée avec une valeur de $p \leq 0,1$ ont été incluses dans la régression logistique multivariée. Les résultats finaux étaient à une valeur $p \leq 0,05$.

Résultats: Dans l'ensemble 3008 (39,9%) des jeunes rwandais âgés de 15 à 24 ans ont déjà eu des rapports sexuels. A peu près 1,375 (45,7%) ont initié précocement les rapports sexuels (avant l'âge de 18 ans) et 726 (37%) ont eu le premier rapport sexuel avec leur copains ou copines. Parmi les jeunes qui ont initié l'activité sexuelle précocement, seulement 19,4% ont utilisé le préservatif. L'analyse multivariée a montré que chez les jeunes qui ont déjà eu des rapports sexuels, ceux âgés de 20 à 24 ans étaient moins susceptibles d'avoir des relations sexuelles précoces (AOR = 0,05 ; IC 95% [0,01-0,18]). Les jeunes qui ont été forcés d'accomplir des actes sexuels non désirés étaient plus de trois fois susceptibles d'initier des rapports sexuels plus tôt que ceux qui n'en avaient pas (AOR = 3,39) ; IC 95% [1,66-6,92]).

Conclusion: Notre étude indique qu'une proportion considérable de jeunes se livre à des activités sexuelles à un âge précoce et pratique des comportements sexuels à risque. Il faudra renforcer les politiques déjà mises en œuvre visant de lutter contre la violence sexuelle, en particulier chez les jeunes, et sensibiliser les jeunes à l'importance de retarder les rapports sexuels.

I. INTRODUCTION

In the context of HIV/AIDS pandemic and other sexual risks, monitoring of trends in age of sexual debut has become increasingly important, especially among youth (1,2). Studies showed that early sexual debut is associated with increased likelihood of risky sexual behavior later in life and increased exposure to HIV transmission (3). Additionally, early sexual debut is associated with younger marriage and early pregnancy, particularly in least developed countries.

In Rwanda, the Demographic and Health Survey (RDHS) has been implemented to monitor data on population, health, and HIV and provide evidence of an upward trend in age at first sex among others (4,5). In the 2015 RDHS, the median age at first sexual intercourse was 21.8 years, an increase of approximately one year since 2010 (20.7 years) (16). Despite this information, RDHS data do not provide evidence on the factors associated with early sexual initiation and the Rwandan response to the prevention of risky behaviors by delaying the onset of sexual intercourse. Early sexual debut is defined as having sex before 18 years (6), the age of legal adulthood in Rwanda. The definition of early sexual debut varies across studies and populations (4), and in several countries including Rwanda, a person under the age of 18 years is considered as a "minor" and the age for sexual consent is 18 (7). The child protection provisions in the Bill of Rights and the Children's Act are afforded to all persons under the age of 18 (8) and The Integrated Child Rights Policy (ICRP) covers children from the time before their birth until they complete the age of 18 years (9).

The initiation of sexual activity is a major milestone for many adolescents on the road to adulthood (10), and a growing concern internationally regarding early sexual intercourse among adolescents is clear (11). Worldwide, more than 700 million women were married before their 18th birthday, and more than one in three (about 250 million) entered into a union before age 15 (12). The World Health Organization (WHO) reports an estimated 16 million births to girls aged 15–19 years and 2 million births in girls younger than 15 years each year. Worldwide, 20% of adolescent girls have given birth by the age of 18 years, whereas in the least developed countries, as many as 1 in every 3 adolescent girls is a mother by the age of 18 years. More than 1 in 4 women aged 20–24 years in sub-Saharan Africa has given birth before 18 years of age. (13)

Early sexual initiation (sex before the age of 18years) among youth in Addis Ababa, Ethiopia was reported to be 42% in individual aged 15-24 years (14). Almost 30% of adolescent girls aged 15–19 years in Central African Republic and adolescent boys in Malawi and Lesotho reported having first sexual intercourse before they were 15 years old (13). Early sexual debut is related to child marriage and this is most common in South Asia and sub-Saharan Africa, and the 10 countries with the highest rates are found in these two regions (12).

A behavior surveillance survey conducted among Rwandan youth in 2011 showed that, the median age at first sexual intercourse was 16 and 17 years for male and female respectively (15). In the 2015 RDHS, the median age at first sexual intercourse was 21.8 years: one in five women (19 percent) had sexual intercourse by age 18 (16). In a study carried out in the Southern province of Rwanda, 41 percent of respondents reported sexual debut before age 15 (17). RDHS showed that among women whose age at sexual debut was 17 and younger, 7 percent to 8 percent were HIV positive (16).

To our knowledge, limited studies have assessed factors associated with early sexual debut in Rwanda and none was conducted in the general population using a nationally representative data. The current study aims to assess socio-demographic, behavior and biological factors associated with sexual debut before 18years among youth aged 15-24 in Rwanda using data from 2015 RDHS.

1.1 Problem statement

Despite many efforts made to improve reproductive and sexual life of adolescents in Rwanda, sexual activity among them is still high and adolescent's sexual and reproductive health needs have been recognized as an underserved area (18,19).

Early sex debut is considered as a high risk behavior and is prevalent in some countries (5,13,20,21). In addition to the increased risk of HIV and other STIs (5), early sexual activity is associated with early marriage and early childbearing curtailing education and other opportunities for adolescents to reach their full potential (13) and a gap in contraceptive use has been observed (22). Data clearly show other important outcomes associated with early sexual

debut including its adverse impact among others, unwanted pregnancy, compromised future fertility, low educational attainment(independent of childbirth), greater social isolation, compromised economic future, and adverse health outcomes, including increased risk of cervical cancer and pelvic inflammatory disease (PID) (11,23,24).

1.2 Study rationale

Knowledge about early sexual debut and subsequent risk factors in youth aged 15-24 years is limited in Rwanda (25). It is important to understand reasons and factors for early sexual debut given the numerous consequences, among them HIV and other STIs, unplanned pregnancies, abortion, infertility etc. Further, youth (15-24 years) represent the main focus for altering the course of HIV epidemic (26). It is important enhance knowledge on adolescent sexuality to inform prevention efforts that meet the needs of youth with different sexual expectations and experience (21).

Assessing these risk factors will help to inform decision and policy makers among other Inter-Ministerial Committee on Children's Rights in Rwanda (MIGEPROF, MOH, MINEDUC, MINALOC, MINIJUST and MINECOFIN) humanitarian and international organizations. Programs can be established that sensitize the society on the consequences of early sexual debut as well as reduce the magnitude of predisposing factors identified by our study to improve sexual and reproductive health for the youth lesser than eighteen years and initiate new strategies for combating the relevant factors and encourage youth to delay sexual onset.

This study also aimed to raise awareness in adults including parents to influence them towards protecting youths against an environment that exposes them to early sexual initiation. It was an opportunity to inform youths to be more conscious of the prevention measures and consequences of the problem.

The study made use of publicly available data collected in the 2015 RDHS. The database included a variety of data, including education level, HIV/STI knowledge, attitudes, and behavior, household and respondent characteristics, tobacco use, and wealth status. A thorough literature review was conducted to identify variables of potential influence on age of sexual

debut. These variables were examined against age of sexual debut, dichotomized as early (<18 years) or normal (≥ 18 years), to evaluate the extent to which, if at all, they are associated with early sexual initiation in Rwanda.

1.3 Objectives

General Objective

- To assess early sexual debut and subsequent risk factors among youth in Rwanda

Specific Objectives

- To describe socio-demographics, knowledge and behavioral factors among youth aged 15-24 year old in Rwanda in 2015.
- To determine the proportion and distribution characteristics of early sexual debut among youth aged 15-25 years in Rwanda in 2015
- To identify exposure factors associated with early sexual debut among youth in Rwanda in 2015

II. LITERATURE REVIEW

This chapter presents findings from literature relating to age at sexual debut. First, different theories of development will be defined and the interaction between psycho-social and biological factors in development discussed. The theories analyzed are as follows: Bioecological, Psychosexual Development, and Life History. These theoretical frameworks will be applied to explain behaviors among adolescents in the context of early sexual debut. Secondly, the context in Rwanda and information on performance of sexual and reproductive health for youth will be described. Thirdly, a thorough literature review of the published literature will be conducted to determine possible factors related to age at sexual debut, , e.g. age, gender, education, religion, residence, number of sex partners, HIV comprehensive knowledge, cigarettes smoking etc. This review will draw on international literature, with a focus on countries with a similar context to Rwanda. A discourse about the relevance of these factors in Rwanda and the consequences of early sexual debut will be provided.

Two key databases were used to conduct the search to determine possible factors associated with: PubMed and Hinari. The following list of key words was used to identify relevant studies: early sexual debut, age at sexual onset, risk factors of early sexual debut, unintended pregnancies in youth. The search was complemented by a review of the reference lists of identified articles and through searches of other health-related science websites. To clarify the context in Rwanda, official documents were retrieved from various ministries and institutes, either as hard copies or via publicly accessible webpages.

2.1 Psycho-social factors shape and interact with biology.

Individuals less than 18 years are faced with a challenging period where it is so hard to control his/her actions and decisions. In the present study, Bioecological Theory (27) and Psychosexual Development (28) were explored in order to understand the risk and protective factors of youth health and to link it with early sexual debut.

2.1.1 Bioecological Theory

The biological theory or Bronfenbrenner's Theory of Development is looks at a child development within the context of the system of relationships that form within his or her environment. Bronfenbrenner's theory defines complex "layers" of environment, each influencing a child's development. This theory has been renamed "bioecological systems theory" to emphasize that a child's own biology is a primary environment fueling her development (27,29). The Bronfenbrenner theory defines **microsystem** environment, or the immediate environment which encompasses the direct contact, relationships and interactions a child has with her immediate surroundings (27). These interactions include those with their immediate family or caregivers, and other relevant organizations/relationships they interact with such as school. School(education) and religious will also interest our study as factors which can influence the belief and behavior of youth (30). Bronfenbrenner theory defines another concept; the **mesosystem** which provides the connection between the structures of the child's microsystem. As examples: the connection between the child's teacher and his parents, between his church and his neighborhood, etc. (29). The **exosystem** defines the larger social system in which the child does not function directly (e.g. the parents' workplaces or extended family) and finally the **macrosystem** that may be considered the outermost layer in the child's environment and comprised of cultural values, customs, the economy, and laws and governance (29).Here the parents' ability or inability to carry out the responsibility toward their child within the context of the child's microsystem is likewise affected (27).

2.1.2 Psychosexual Development and Life History Theories

To explore the developmental aspects of personality and the decisive role of the early experiences during infancy and childhood in laying down the basic character structure of an adult person, we used Freudian concept given that Freud Sigmund (1938/1973) is often considered the first psychological theorist in that matter (28). We also used the Life History Theory (31) of Kevin MacDonald which incorporates environmental influences, contextual influences, and

heritable variation. Kevin MacDonald argued that physically or psychologically stressful environments delay maturation and the onset of reproductive competence. The social context is also important, and here he concentrated on the opportunity for upward social mobility as a contextual influence that results in delaying reproduction and lowering fertility in the interest of increasing investment in children and showed that cultural shifts in the social control of sexual behavior have had differential effects on individuals predisposed to high-investment versus low-investment reproductive strategies (32).

Also known as theory of libidinal development, psychosexual development is based on the idea that parents play a crucial role in managing their children's sexual and aggressive drives during the first few years of life to foster their proper development (28,33,34). Development of sexuality is an important bio-psycho-social development during adolescence. Parents attitudes initially formed at home and so parental models and teachings are important as well as peers' later influence and the wider social arena (28). Psychosexual development is one of the earliest theories explaining how personality develops in human beings. According to psychoanalytical theories, development happens in various stages and children are confronted with conflicts between biological drives and societal expectations (35).

2.2 Performance of Sexual and reproductive health for youth in Rwanda

Rwanda has made a significant progress concerning sexual and reproductive health for youth especially regarding the following components: legal and policy environment, adolescent and young adult wellbeing, health and sexuality, reproductive health and HIV/AIDS, family planning (FP) STIs, and human papilloma virus (HPV) (19,36).

Youth friendly Sexual and Reproductive Health services were implemented and recommend good customer care, greater integration of related services within existing health services to suit adolescents' needs, and, confidentiality as the three main underlying principles to enhance these services' acceptability and accelerated uptake by adolescents and young adults (36). Active sensitization of youth to issues surrounding sexual debut and sexual health is conducted nationally by the Ministry of Health (MOH) and Rwanda Biomedical Center (RBC); other institutions and non-governmental organizations are all instrumental in the sensitization of young people in Rwanda.

Figure 1 depicts the sensitization activities conducted by the MOH in 2014 at various educational and religious institutions.

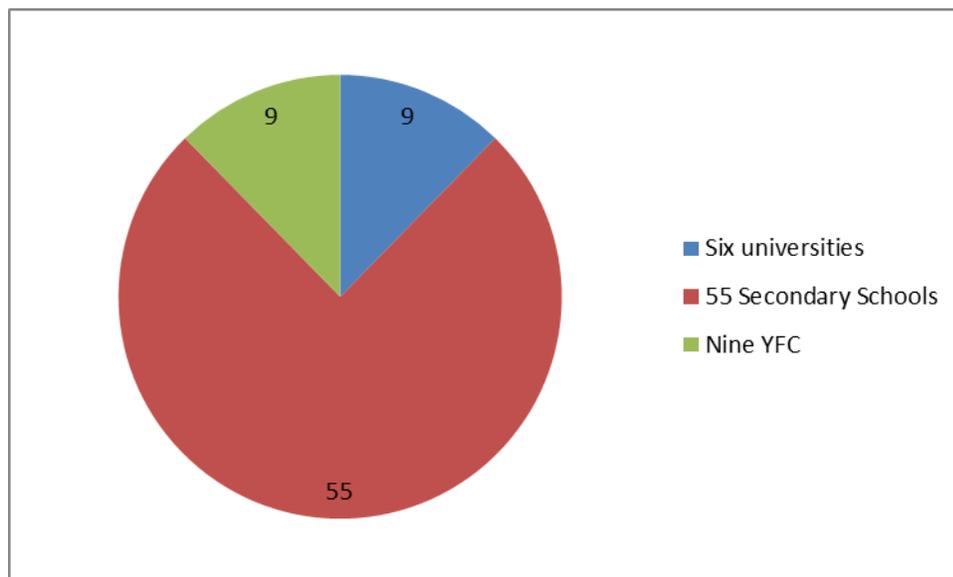


Figure 1: Percentage of youth sensitized on HIV/STIs by MOH in 2014

2.3 Early sexual initiation among youth

In 2011, estimates suggest that worldwide more than 60 million women aged 20–24 years were married before the age of 18 years (37). Evidence suggests that the timing of first sexual intercourse is related to numerous short and long-term consequences, both in terms of health and non-health related outcomes. Early sexual initiation leaves adolescents, particularly females, at elevated risk of unintended pregnancies, HIV and other STIs, and other negative social and psychological outcomes, and contributes to ongoing health (38). These adverse social, emotional, and physical health outcomes as a result of early sexual initiation often proliferate and continue into adulthood (39). Despite its frequency, little is known about the long-term consequences of early sexual intercourse (4). Further, adolescents engaging in early sex are often more at risk of subsequently engaging in other risk behaviors, such as alcohol and drug use, and other risky sexual behaviors. As such, it is important to understand the determinants of early sexual debut in adolescents. We defined early sexual debut as sexual intercourse initiation before eighteen years

as this is the threshold of legal age of consent in Rwanda and has been used widely in other analyses concerned with other countries and populations.

2.3.1 Rwanda context

In Rwanda, the legal age of consent is 18 years, and the legal age of marriage is 21 years; (40) sex before marriage remains taboo and considered morally and legally wrong (25). The following data is from the RDHS2014-2015. Approximately one in five women (19 percent) and 23 percent of males had sexual intercourse by age 18 in Rwanda; 5 percent of females and 11 percent of males had sexual intercourse before age 15. Incidence of early sexual debut (either prior to 15 or 18 years of age) has increased over time. In the survey, 7.5 percent of women aged 15-17 at the time of the survey engaged in intercourse before age 15 compared with 2.9% of 23-24 year old's; when looking at the age 18 cut-off, 23.6% of females aged 18-19 compared with 15.3% of females aged 23-24 engaged in early sex. Similar trends were observed in men, where 12.9% and 6.0% of individuals age 15-17 years and 23-24 years respectively at the time of the survey engaged in sexual intercourse before the age of 15; 28.1% of men aged 18-19 and 19.0% of men age 23-24 engaged in sexual intercourse before age 18.

Regarding sexual practices and HIV infection, overall, the prevalence of HIV was highest in individuals aged 16-17 at first sexual intercourse (6.2%). By gender, females had a higher risk of HIV infection at earlier sexual initiation compared with men; prevalence of HIV was 7.8% in females whose first sexual intercourse was at age 16-17, compared with 3.3% in men. RDHS 2015 data also shows that seven percent of adolescent women age 15-19 are already mothers or pregnant, and that four percent of young women age 17 have already had at least one child or are pregnant for the first time in 2015 (16). Early pregnancy is a concern given that; first, children born to very young mothers are at greater risk of illness and death. Second, teenage mothers are more likely to suffer complications during pregnancy and less likely to treat them, exposing them to a greater risk of complications during delivery and a greater risk of dying for reasons related to childbearing. Third, early childbearing seriously affects a woman's ability to pursue an education, thereby limiting her job opportunities (16).

Combined, these evidences indicate that an important point that early sexual initiation is a growing issue in Rwanda, and results in a high risk of HIV infection and increases the likelihood of early pregnancy. As such, interventions among adolescents to target early sexual debut in Rwanda prior to the age of 18 years are to be intensified. There is currently limited data to exploring determinants of early sexual debut in Rwanda which are necessary to better inform policies and interventions.

2.3.2 Evidence from other countries

In United States about 13% of never-married females aged 15–19 and 18% of never-married males in that age-group had had sex before age 15 (41), and earlier initiation of sexual intercourse was strongly associated with STIs for older adolescents but not for young adults over age 23 years (42).

In South Africa, the median age at sexual debut was 18.5 and 19.2 years in men and female and factors associated with earlier sexual debut were peri-urban residence (vs rural), ever use of alcohol and knowing at least one person who had HIV, while school attendance had a significant protective effect. Maternal death was significantly associated with earlier sexual debut for women, in the same way that paternal death was for young men (43).

In western Ethiopia, the mean (\pm SD) age of sexual initiation was 17.07 years(\pm 2.12) (6). The age at first sexual initiation was positively associated with lack of employment, lack of comprehensive knowledge on HIV and alcohol use (6).

Niger has the highest overall prevalence of child marriage in the world; 77 percent of women aged 20 to 49 were married before age 18 and 5 per cent of men in the same age group, and Bangladesh has the highest rate of marriage involving girls under age 15. In 3 countries with the highest prevalence of early childbearing; Guinea, Mali, and Niger, around 10% of women gave birth before 15 years of age (13). A study conducted in one university in Uganda shows that most students were sexually active and had started having sex before joining university, had multiple sexual partners, were mainly not using condoms and were engaging in sex under the influence of alcohol (44). More than 10% of girls or boys in Madagascar, Cameroon, Uganda,

Kenya, Guyana, Sao Tome, Principe, Senegal, Rwanda, Tanzania, and Kiribati had early sexual debut (13).

In Kenya, lower levels of perceived HIV risk were associated with early sexual initiation, adolescents who felt they were at no risk of HIV infection were most likely to postpone initiation (45). In another study done in Nairobi-Kenya young adolescents (10-14 years), sexual debut was positively associated with having permanently dropped out of school (odds ratios, 6.9 and 21.8, respectively), having never attended school (8.6 and 39.4) and having experienced severe family dysfunction (2.8 and 5.7). Lack of parental supervision was a predictor of sexual debut among males only (10.1), whereas low aspiration was a predictor among females only (10.4) (46).

Having had multiple partners was associated with pregnancy only for youth with early sexual debut (47). It has been shown that among adolescents from Burkina Faso, Ghana, Malawi, and Uganda, the community levels of adolescent marriage, wealth, religious group affiliation, sex education, parental monitoring, reproductive health knowledge, media exposure, membership in adolescent social group, and use of alcohol, emerge as risk or protective factors of early sexual debut (48).

2.4 Risk factors related to early sexual debut

As evidenced by different literatures timing of sexual debut among youths is influenced by a wide range of factors including age, gender, residence, educational level, knowledge on HIV, economic status, watching pornography and alcohol utilization (5). Assessing risks factors related to early sexual debut is an important element in reduction of its consequences. Few studies were conducted in Rwanda to assess these factors, but in other settings, numerous studies have been reported and below are some key findings:

Age

Pubertal development is the acquisition disclosure index of adult reproductive capacity (20). Age was shown to increase the odds that adolescents were sexually active (49,50). Most people initiate sexual activity between 15 and 19 years of age(51). In a study done in 622 youth's attending youth centers in Addis Ababa, Ethiopia, younger age was associated with early sexual

debut (14). Studies suggest that early initiators are less likely to know how to prevent STIs, including HIV, or to be able to negotiate condom use than are those who delay sexual intercourse (45). For young females, early initiation poses additional risks because of their physiological immaturity and the power differentials between them and older male partners (45).

Sex

UNICEF reports that an estimated 82 million girls around the world, some as young as 10 years of age, will marry before their 18th birthday (52). Sexual debut is earlier for males than for females (3,14,51,53). Males are pressured into very early sexual activity to prove their maturity (45,49) and for girls, it is often initiated within the context of marriage, or as a result of coercion, frequently with older men (51). Sex before 15 years of age is more common among adolescent girls than boys in low- and middle-income countries, consistent with early marriage and early childbirth in these countries (13). Evidence from a study carried out in the Southern Province in Rwanda showed that, male gender was more likely associated with early sexual debut than female gender (50.4% versus 26.7%) but females reported more sexual onset with an older partner (17). Among Rwandan women whose age at sexual debut was 17 and younger, 7 percent to 8 percent were HIV positive, a figure that decreases to 3 percent among women whose sexual debut was at age 20 or older (16).

Residence

Youth in rural areas tended to initiate sexual debut earlier than those in urban areas (54). In a study carried out in China, sexual debut before age 18 was rare for both genders, and ages 21–24 appear to be the normative range for sexual debut. Sexual debut was earlier for those living in a rural area than for those in urban areas (53,55).

Religion

The influence of religion on an individual's sexual behavior has long been recognized by social scientists, although few studies have explored the reciprocal causal interdependence between religiosity and sexual debut (56). In Nigeria, higher level of religion was associated with lower sexual debut rates among females only (57). A study conducted in Brazil showed that both male and female adolescents affiliated with Protestant faiths, particularly Pentecostalism, have

significantly lower odds of reporting sexual initiation before age 18 compared to their non-affiliated counterparts (58), and teens belonging to a religious group also demonstrated lower odds of sexual initiation (58,59). Age at first sex did increase among Nigeria Muslim women (60).

Education

Schools play a very important role as a place to provide sexual information to young men and women about safer sex, breaking taboos about sexual health and stimulating an intergenerational dialogue, involving students, parents and teachers (61). Early childbearing has been linked to higher rates of limited or shortened educational opportunities (5). A study conducted in unmarried young women in urban Kenya showed that having secondary education was associated with a later time to first sex and first pregnancy (59).

Number of sex partners

Early first sexual intercourse is significantly associated with having lifetime multiple sexual partners (64). Early sexual initiators had an increased likelihood of having had multiple sex partners (21,65). A study from South Africa showed that multiple sexual partners are significantly more common among those that had early sexual debut (10.4% vs. 4.8%) than those who had late sexual debut, (OR=2.29, p-value <0.001) (3) Studies showed that 63% of pregnant youth who reported having had first sex by age 14 had multiple partners (47).

Age of household head

Families and especially parents remain one of the most powerful socializing influences on the sexual attitudes and behaviors of adolescents (66). Research on the family's role on adolescents' sexual risk behaviors in sub-Saharan Africa has been minimal and rarely takes into account the varying family structures within which African adolescents develop (67). A study in Nigeria including adolescent girls showed non-pregnant adolescents had older household heads (68).

Sex of household head

Female-headed households were less likely to experience unwanted adolescent pregnancy compared to those of the reference group category (68). A study conducted in Nairobi, Kenya showed that when the father is present in the household (i.e. father only or both parents present), adolescent girls are 42 percent less likely to have ever had sex ($p < 0.05$), 45 percent less likely to have been sexually active in the most recent four-week period ($p < 0.1$), and 59 percent less likely to have ever experienced an unwanted pregnancy ($p < 0,05$) than when neither parent, or only the mother, is present in the household (69).

HIV comprehensive knowledge

Lack of knowledge about sex and family planning and the lack of skills to put that knowledge into practice put adolescents at risk of pregnancy (51). The one global measure of coverage related to sexuality education indicates that only 36% and 24%, respectively, of young men and young women aged 15–24 years in developing regions have comprehensive and correct knowledge of HIV/AIDS (51). Both males and females who rejected myths about HIV transmission, those who experienced less sexual pressure and those who did not know anyone who had died of AIDS, as well as males who had a stronger belief in their ability to abstain, were more likely to postpone sexual intercourse than were young people who lacked those characteristics (45). Lack of HIV information (OR = 1.22, 95% CI = 1.03-1.44) influenced the sexual risk behaviors of the adolescents (55). The high HIV/AIDS knowledge level did not translate to low involvement in premarital sex or high condom use, nor did it result to reduced HIV prevalence among the group of pregnant women in Abuja, Nigeria (70). Positively, adolescents with high knowledge of HIV infection are more likely to use condoms for every sexual encounter (55). According to UNICEF, adolescents are aware of HIV but only one in four adolescents had correct knowledge of HIV transmission (71).

Social Economic Status (Wealth Index)

According to the World Bank, in Rwanda early childbearing is more prevalent among the poor. While the rich-poor gap in prevalence of early childbearing is negligible among 20-24 year olds, 22 percent of the poorest 25-34 years old women have had a child before reaching 18 compared

to 15 percent of their richer counterparts did (72). In a study conducted among adolescents in Kenya the odds of having initiated sexual activity were more than 60% higher when circumstances relating to wealth were controlled for (73). Males in the lowest wealth index were less likely than those in the highest wealth index to have been sexually active or to have had multiple partners (48,74). An analysis of studies run in nineteen countries of sub-Saharan Africa revealed that household circumstances relating to living arrangements and poverty are important pathways through which household HIV/AIDS status is linked to adolescent sexual debut (75).

Nationally representative data collected from Burkina Faso, Ghanaian, Malawian, and Ugandan adolescents identifies a later sexual debut among wealthiest girls in Ghana, Malawi and Burkina Faso, but this result is not outstanding in Uganda. It further recognizes that poor females are more vulnerable to infection as compared to wealthier counterparts due to their earlier sexual debut (76).

2.5 Reproductive health and other problems due to early sexual debut

Early and unwanted pregnancies

According to WHO, in 2008, there were 16 million births to mothers aged 15–19 years, representing 11% of all births worldwide and about 95% of these births occurred in low- and middle-income countries. Researches showed that greater proportions of pregnant youth than of their never-pregnant peers reported having had first sex by age 14 (47,51).

STIs

Compared to late initiators, people who initiated sexual activity early engaged in more risky behaviors that could lead to elevated risks of STDs or HIV (51) The odds of having an STI for an 18- year-old who first had intercourse at age 13 were more than twice those of an 18-year-old who first had intercourse at age 17 (4) Contracting STIs during young adulthood can have significant adverse consequences for reproductive health. STIs can cause complications such as PID, infertility, ectopic pregnancy, preterm birth, and fetal abnormalities (4).

HIV

Age at sexual debut is an important indicator for exposure to heterosexual HIV transmission (3). Each day, nearly 6,000 young people between the ages of 15 and 24 become infected with HIV and early onset of sexual activity, can quell the spread of HIV/AIDS (3,77). Studies showed that early coital debut is associated with factors that may increase a young person's risk for HIV infection, such as forced sex and having older partners (78,79). In a study done in Zimbabwe, HIV risk was increased for women reporting early age of coital debut (relative hazard, 1.30; 95% confidence interval, 1.13-1.50) (80).

Human Papilloma Virus (PID)

Young women who initiate sexual intercourse at an early age are more likely than those with later sexual debuts to become infected with human papillomavirus (HPV) in part because of certain biological, behavioral factors and partner characteristics (81). Delaying the age at which young people first have sex can significantly protect them from infection (77). Being diagnosed as having herpes simplex virus 2 is associated with early sexual initiation (78,82) A study done in South African youth showed that early sexual debut(<16 years) was associated with cervical cancer risk; AOR 1.6 (95% CI 1.2 – 2.2) (79).

2.6 Conceptual framework

Set within the theories of development described above, the literature review aimed to identify possible factors that could be associated with early sexual debut. The conceptual framework shown below shows diagrammatically how ideas on individual characteristics such as age, sex, religion, educational level and residence of individual can directly influence early sexual debut or through intermediate factors such as number of sex partner, HIV comprehensive knowledge. Family background like social economic status (wealth index), age of household head and sex of household head can also directly or intermediary influence the early sexual initiation. The following conceptual framework shows also that peers' can directly or not influence early sexual debut of youth. (Figure 2)

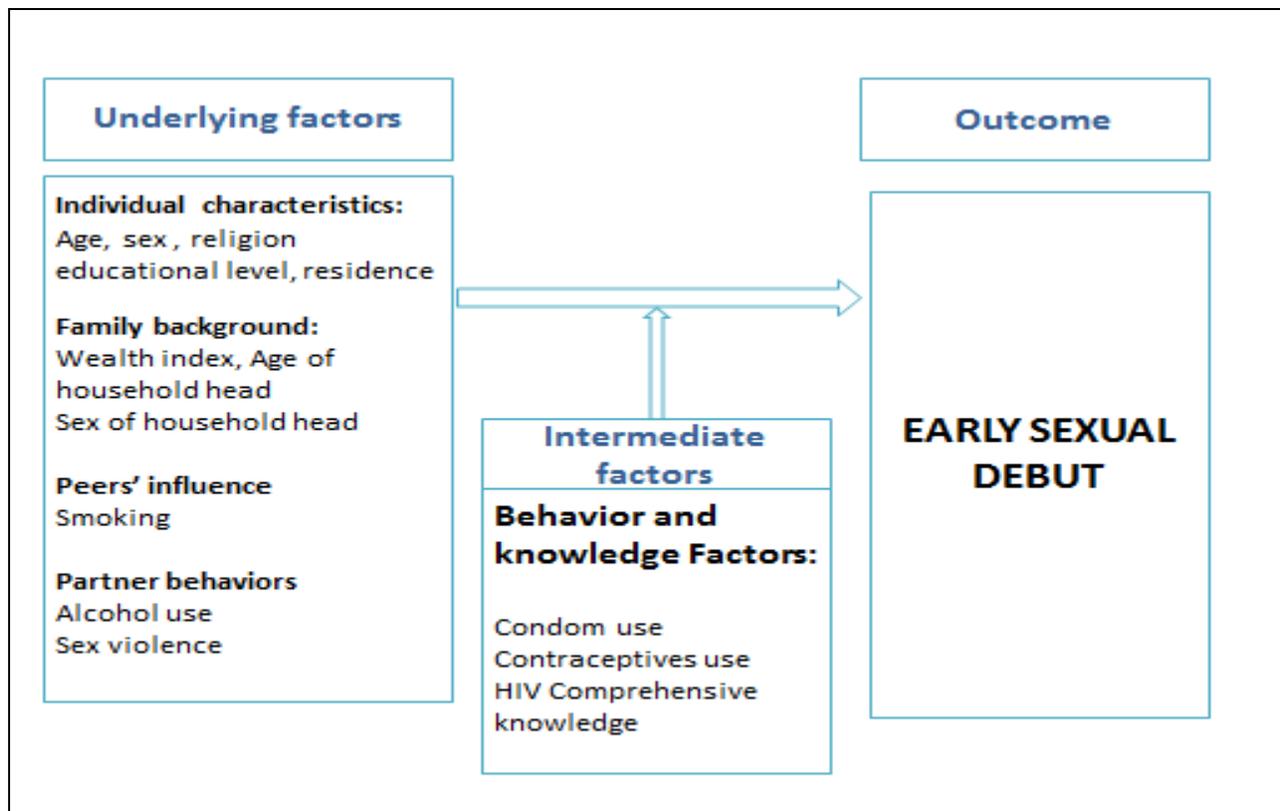


Figure 2: Conceptual Framework

III. METHODOLOGY

3.1 Study design

The current study is a nationally-representative cross sectional study using secondary data analysis of the Rwanda Demographic and Health Surveys 2014-15 (RDHS).

RDHS provides nationally representative estimates of sexual and reproductive health in population aged 15-49 for women and 15-59 for men. The survey uses population sampling frames for data collection which makes the dataset nationally representative. In DHS, youth aged 15-24 are assessed for sexual and reproductive health.

3.2 Sampling Methods (RDHS 2015)

A representative sample of 12,793 households was selected in two stages for the RDHS 2015. In the first stage, 492 clusters/villages were selected; 113 in urban areas and 379 in rural areas. In the second stage, a complete mapping and listing of all households existing in the selected villages was conducted (16).

All 492 villages selected for the sample were surveyed for the RDHS 2015. A total of 12,793 households were selected, of which 12,717 were occupied at the time of the survey. Among these households, 12,699 completed the Household Questionnaire, yielding a response rate of nearly 100 percent. There was little variation in response rates by urban-rural residence (16).

In the 12,699 households surveyed, 13,564 women age 15-49 were identified as being eligible for the individual interview; interviews were completed with 13,497 of these women, yielding a response rate of 99.5 percent. Male interviews were conducted in every second household. A total of 6,249 men age 15-59 were identified in this subsample of households. Of these men, 6,217 completed individual interviews, yielding the same response rate of 99.5 percent. Subsample of households selected for male survey, blood spot samples were collected for laboratory testing of HIV from eligible women and men who consented. Height and weight information was collected from eligible men. In one-third of the same subsample (or 15 percent

of the entire sample), blood spot samples were collected for laboratory testing of children age 0-14 for HIV (16).

3.3 Sample size, population and inclusion criteria

In Rwanda, adolescents aged 15-19 years make about 12.4% of the Rwandan population and those aged 20-24 years comprise 10.7% of the total population (36). This shows that in Rwanda, youth aged 15-24 years are around 23% of the whole population

We conducted our study in youth to support the effort of Rwanda government, local leaders, families and community in the way of having the promised healthy and wealthy Rwandan by educating and enriching youth, and included all 7,532 male and female youths aged 15-24 years at the time RDHS 2015. We conducted an analysis among only individuals who had had sex by the time of the survey.

The diagram below illustrates the profile of our study population and steps followed in their selection

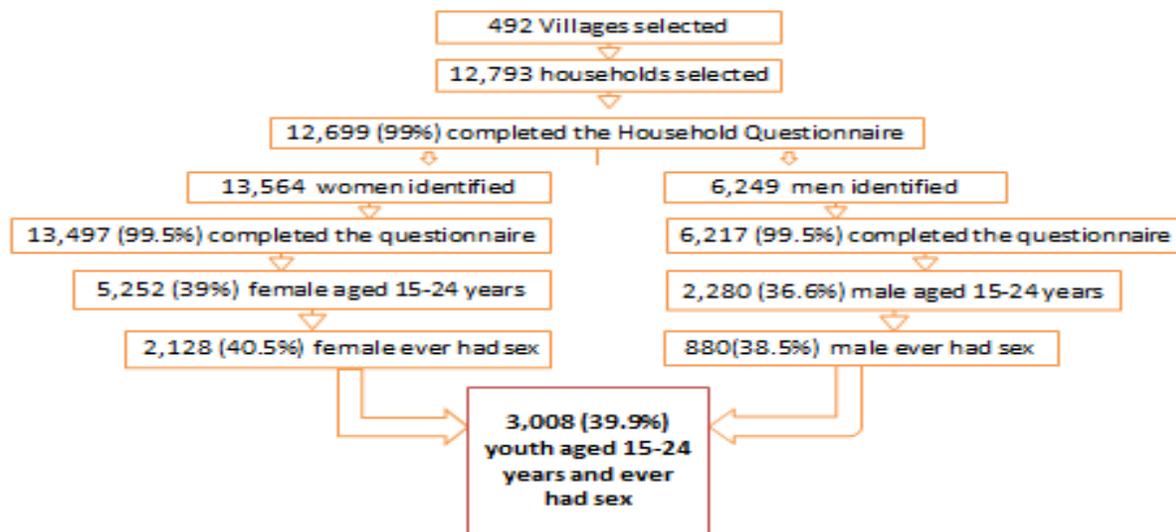


Figure 3: Profile of study population, factors associated with early sexual debut among youth; Rwanda 2016

3.4 Measurement variables

The RDHS 2014-2015 records a wide number of variables, many of which may not be related to the current question (factors associated with age at sexual debut). Those factors identified in the literature review as potentially relevant were included as independent variables for analysis (See Conceptual framework)

Independent variables

Socio-demographic characteristics of participants included;

- Age in complete years
- Sex of youth
- Religion of youth
- Education status of youth
- Residence of youth
- Wealth index in the family
- Age of head of household,
- Sex of head of household

And other factors analyzed included

- Smoking
- Condom use
- STIs
- HIV
- Knowledge of HIV/AIDS prevention and risk perception; here the comprehensive knowledge was assessed “ as percentage of young men and women (15-24 years) **who correctly identify** the two major ways of preventing the sexual transmission of HIV (using condoms and limiting sex to one faithful, uninfected partner), **who reject** the two most common local misconceptions about HIV transmission **HIV/AIDS cannot be transmitted by mosquito bites** and **HIV/AIDS cannot be transmitted by sharing foods**; and who know that a healthy-looking person can have HIV.”A respondent was

considered as having correct knowledge of HIV prevention when he/she responded correctly to all five questions

Dependent Variables

- Early sexual debut (sexual debut before 18 years)

1.1 Operational definitions

Age: Age of the participant, categorized in 5 year group interval

Sex household head: Sex of household head is dichotomous variable: female or male

Marital status: marital status categorized in three sub categories: 1. Single, 2. Married or living with a partner, 3. widowed, divorced/separated

Education level: education level of the participant is categorized in three subcategories: 1. No education, 2. primary, 3. secondary and higher

Religion: Religion of the participant is composed by four categories: 1. Catholic, 2. Protestant & Adventist, 3. Muslim, 4. others

Residence: Residence area is dichotomous variable: urban and rural area

Sexual transmitted infection: If participant had sexual transmitted infection (STIs) or symptoms of STI in 12 months preceding the survey. It is a dichotomous variable (yes/no),

Early sexual initiation: Was defined as experience of sexual intercourse before the age of 18 years and all these operational definitions were adopted from the RDHS and UNICEF

Youth: person who are in the age group 15-24 years.

Comprehensive knowledge on HIV: Was measured by ability to identify the two important prevention ways (being faithful and condom use), being aware that a healthy-looking person can have HIV and reject the two locally common misconceptions about HIV transmission (mosquito bite and sharing food) (5).

Household Wealth index: The wealth index is a composite measure of a household's cumulative living standard. The wealth index is calculated using easy-to-collect data on a household's ownership of selected assets, such as televisions and bicycles; materials used for housing construction; and types of water access and sanitation facilities (16). The wealth index places individual households on a continuous scale of relative wealth. DHS separates all interviewed households into five wealth quintiles; poor, poorest, middle, rich, richest, to compare the influence of wealth on various population, health and nutrition indicators - See more at: <http://www.dhsprogram.com/topics/wealth-index/#sthash.TAFREiEH.dpuf>. In our study, we categorized the wealth index in poor combining “poor and poorest”, middle representing “middle” and rich combining “rich and richest” categories

Risky sexual behaviors: early sexual intercourse, unprotected sex and multiple sexual partners

Condom use: was defined as condom used during sexual intercourse with the most recent, the second and the third sexual partner

STIs: was defined as having STIs, genital discharge and ulcer in the last 12 months preceding the survey.

HIV status: was defined as having been tested positive for HIV antibodies at the time of the survey

Unprotected sex: Sexual intercourse without or with occasional use of condom

1.2 Ethical considerations

We did not personally seek the ethical clearance, because ethical considerations are well addressed in all DHS surveys around the world. However we officially requested data to National Institute of Statistics Rwanda (NISR) and we signed an agreement to not publish them without their permission

In the RDHS 2015, the selected respondents signed a written informed consent before the survey and a written statement describing the benefits and potential risks was read to them. To show that the decision was given by respondent, the interviewer was asked to record on the questionnaire the respondent's decision. To safeguard anonymity of biological samples collected, the cluster

and household numbers associated with any participants were randomized to render it impossible to link any individual data with a specific household or place,

1.3 Dissemination of results

Final results of this study will be presented at University of Rwanda, College of Medicine and Health Sciences, School of Public Health, to the Ministry of Health and Rwanda Biomedical Center to guide programmatic decision making. Publication in a reputable journal and presentation of results in conferences will be processed after submitting a copy of the reports/publications to: archive@dhsprogram.com.

1.4 Data analysis

Descriptive analysis has been used to compute proportions. Bivariate analysis of demographic and non-demographic variables was performed to examine differences between sex debut before 18 years and at 18 and above. Chi-square, corresponding odds ratio, and 95% confidence interval were computed to examine whether the bivariate association between pairs of dichotomous independent and dependent variables was significant and the magnitude of the association. Finally logistic regression was used to assess the contribution of each independent variable in predicting the early sexual debut. All significant variables from bivariate analysis at a p-value of 0.1 were entered in multivariate model using binary logistic regression to control confounding and finally those which were significant at a p-value of 0.05 were reported in our results.

IV. RESULTS

4.1 Description of socio-demographics of respondents

A total of 7,532 youth aged 15-24 years were included in our study. The table below shows that the high proportion of our population was aged 15-19 years (53.9 percent) and was female (69.7 percent), many were from rural area (73 percent) and never married (83.4 percent)

Table 1: Characteristics of youth respondents in RDHS 2015, N=7532

	Freq.	Percent
Overall	7532	100
Age of respondent at the time of the survey		
15-19	4060	53.9
20-24	3472	46.1
Sex		
Male	2280	30.3
Female	5252	69.7
Wealth index of household		
Poor	2425	32.2
Middle	1347	17.9
Rich	3760	49.9
Educational level		
No education	193	2.6
Primary	4307	57.2
Secondary and higher	3032	40.3
Residence		
Urban	2026	26.9
Rural	5506	73.1
Religion*		
Catholic	3199	42.5
Protestant & Adventist	4036	53.6
Muslim	197	2.6
Others	93	1.2
Marital status		
Never married	6283	83.4
Married & living with partner	1093	14.5
Widowed & divorced & separated	156	2.1
Age of household head**		
15-19	77	1
20-24	723	9.6
25+	6730	89.4
Sex of household head		
Male	5024	66.7
Female	2508	33.3
* seven Missing		
** Two missing		

4.2 Sexual behaviour of youths respondent in RDHS 2015

The table 2 shows that 3,008 (39.9%) of respondents had already had sex by the date of the survey. Among these, 1375(45.7%) had sexual intercourse before 18 years. Of these, 1108 (80.6%) did not use a condom. About 726 (37%) had sex with a boyfriend not living with them while others were living in partner 687 (34.6%). The table shows also that 12% of respondent were ever forced to perform unwanted sexual acts

Table 2: Description of sexual behavior of youth respondents in RDHS 2015, N=7532

	Freq.	Percent
	n	%
Ever had sex (N=7,532)		
Yes	3,008	39.94
No	4,524	60.06
Age at first sex (N= 3,008)		
At or after 18 years	1,633	54.29
Before 18 years	1,375	45.71
Condom used before 18 years (N=1,375)		
No	1,108	80.58
Yes	267	19.42
Relationship with first partner (N=1,956)		
Spouse	489	25
Boyfriend not living with respondent	726	37.12
Casual acquaintance	44	2.25
Commercial sex worker	9	0.46
Live-in partner	678	34.66
Other	10	0.51
Ever forced to perform unwanted sexual acts (N=1457)		
No	1279	87.78
Yes	178	12.22

4.3 Sexual debut according to socio-demographic, behaviour and biological factors

The table 3 shows that among the total of 3008 youth who ever had sex, 1375 (45.7%) initiated early. Female initiated sexual intercourse earlier than males; 64.9 percent compared with 35.1% in male. Rich youth are also initiating sexual intercourse early, the same for those who attained

primary school, those in rural area, those never married, and those whom household head are male or aged 25 years and above.

Table 3: Sexual initiation according to sociodemographic, behavior and biological characteristics, N=3008

	Had sex at or after 18 years		Had sex before 18 years		Total	
	n	%	n	%	n	%
Age of respondent at the time of the survey						
15-19	124	7.6	736	53.5	860	28.6
20-24	1509	92.4	639	46.5	2148	71.4
Sex						
Male	398	24.4	482	35.1	880	29.3
Female	1235	75.6	893	64.9	2128	70.7
Wealth index						
Poor	592	36.3	462	33.6	1054	35
Middle	313	19.2	227	16.5	540	18
Rich	728	44.6	686	49.9	1414	47
Education						
No education	75	4.6	54	3.9	129	4.3
Primary	1028	63	892	64.9	1920	63.8
Secondary and higher	530	32.5	429	31.2	959	31.9
Residence						
Urban	471	28.8	428	31.1	899	29.9
Rural	1162	71.2	947	68.9	2109	70.1
Religion						
Catholic	634	38.8	567	41.3	1201	40
Protestant, Adventist	934	57.2	730	53.2	1664	55.4
Muslim	51	3.1	50	3.6	101	3.4
Others	14	0.9	26	1.9	40	1.3
Marital status						
Never married	717	43.9	1042	75.8	759	58.5
Married, living with partner	826	50.6	267	19.4	1093	36.3
Widowed,divorced,separate	90	5.5	66	4.8	156	5.2
Age of household head						
15-24	433	26.5	194	14.1	627	20.8
25+	1200	73.5	1181	85.9	2381	79.2
Sex of household head						
Male	1216	74.5	906	65.9	2122	70.5
Female	417	25.5	469	34.1	886	29.5

Table 3 continued

	Had sex at or after 18 years		Had sex before 18 years		Total	
	n	%	n	%	n	%
Number of sex partners in last 12 months						
One sex partner	1,233	97.0	639	93.1	1,872	95.7
More than one sex partner	37	2.9	47	6.9	84	4.3
HIV comprehensive knowledge						
No	487	29.8	509	37.1	996	33.1
Yes	1146	70.2	864	62.9	2010	66.9
Current use of contraceptive method						
Non users	1105	67.7	1066	77.5	2171	72.2
Users	528	32.3	309	22.5	837	27.8
Age of most recent partner*						
Lesser than 18 years	8	0.6	56	8.2	64	3.3
18-24	542	42.7	329	48	871	44.6
25 years+	706	55.6	292	42.6	998	51.1
Smokes cigarettes						
No	1610	98.6	1343	97.7	2953	98.2
Yes	23	1.4	32	2.3	55	1.8
Condom use						
No	1352	82.8	1108	80.6	2460	81.8
Yes	281	17.2	267	19.4	548	18.2
STIs						
No	1473	90.2	1235	89.8	2708	90
Yes	160	9.8	140	10.2	300	10
HIV Results**						
Negative	1010	98	883	97.6	1893	97.8
Positive	21	2	22	2.4	43	2.2

*Age of most recent partner; response given only by those who had recent partner(spouse or not)

** HIV testing was done in to ½ household (not to all individual)

4.4 Factors associated with early sexual debut among youth in Rwanda

A. Bivariate analysis

The table 4 shows that youth aged 20-24 years at the time of the survey were less likely to initiate sex early compared with adolescent aged 15-19 years OR:0.07; 95%CI [0.06-0.09]. Compared to male, female were less likely to initiate early sexual intercourse OR: 0.59 and 95%CI [0.51- 0.70]. Results shows also other protective factors including; being married or living with partner, OR: 0.22; 95% CI [0.19-0.27], widowed, divorced, separated OR: 0.50; 95% CI [0.36-0.70], having HIV comprehensive knowledge, OR: 0.72; 95% CI [0.62-0.84] and contraceptive use OR: 0.60; 95% CI [0.51-0.72]

The study showed the following factors as being more likely to influence early sexual debut; household head age 25 and above, OR: 2.19; 95% CI [1.81-2.65], youth in rich category OR: 1.21;95% CI [1.03-1.47], religions other than Catholic, Protestant, Adventist and Muslim OR: 2.08; 95% CI [1.07-4.02] , household head aged 25 years and above, OR 2.19; 95%CI [1.81-2.65] youth whose households are headed by female, OR: 1.51; 95%CI [1.29-1.77] youth with more than one sex partner OR: 2.45; 95%CI [1.57-3.81], cigarettes smoking OR: 1.67; 95%CI [0.97-2.87], youth whose partners drink alcohol, OR: 1.64; 95%CI [1.00-2.68] and those who were ever forced to perform unwanted sexual acts OR: 1.75; 95%CI [1.16-2.63]

Table 4: Sexual debut by selected characteristics of the study population (N=1,375)

	Had sex before 18 years		OR	P-value	95%CI
	n	Proportion %			
Age of respondent at the time of the survey(N=1375)					
15-19	736	53.5	Ref	-	-
20-24	639	46.5	0.07	<0.001	0.06-0.09
Sex (N=1375)					
Male	482	35.1	Ref	-	-
Female	893	64.9	0.59	<0.001	0.51- 0.70
Wealth index (N=1375)					
Poor	462	33.6	Ref	-	-
Middle	227	16.5	0.93	0.49	-
Rich	686	49.9	1.21	0.021	1.03-1.47
Religion (N=1373)					
Catholic	567	41.3	Ref	-	-
Protestant, Adventist	730	53.2	0.87	0.076	0.75-1.01
Muslim	50	3.6	1	1	1
Others	26	1.9	2.08	0.027	1.07-4.02
Marital status (N=1375)					
Never married	1042	75.8	Ref	-	-
Married, living with partner	267	19.4	0.22	<0.001	0.19- 0.27
Widowed, divorced, separated	66	4.8	0.50	<0.001	0.36-0.70
Age of household head (N=1375)					
15-24	194	14.1	-	-	-
25+	1181	85.9	2.19	<0.001	1.81-2.65
Sex of household head (N=1375)					
Male	906	65.9	Ref	-	-
Female	469	34.1	1.51	<0.001	1.29-1.77
Number of sex partners (N=1374)					
One sex partner	639	93.1	Ref	-	-
More than one sex partner	47	6.9	2.45	<0.001	1.57-3.81
HIV comprehensive knowledge (N=1373)					
No	509	37.1	Ref	-	-
Yes	864	62.9	0.72	<0.001	0.62-0.84

Table 4 Continued

	Had sex before 18 years	Proportion	OR	P-value	95%CI
	n	%			
Current use of contraceptive method (N=1375)					
Non users	1066	77.5	Ref	-	-
Users	309	22.5	0.60	<0.001	0.51-0.72
Condom used (with most recent sexual partner)					
No	2,490	97.8	Ref		
Yes	56	2.2	1.16	0.12	0.96-1.39
Smokes cigarettes					
No	1343	97.7	Ref	-	-
Yes	32	2.3	1.67	0.061	0.97-2.87
Husband/partner drinks alcohol (N=89)					
No	33	37.1	Ref	-	-
Yes	56	62.9	1.64	0.048	1.00-2.68
Ever forced to perform unwanted sexual acts (N=279)					
No	221	79.2	Ref	-	-
Yes	58	20.8	1.75	0.007	1.16-2.63

B. Multivariate analysis

As shown in table 5, among youth aged 15-24 at the time of the survey, who ever had sex, those who were aged 20-24 were less likely to initiate early sexual intercourse; AOR=0.038; 95%CI[0.01-0.15] compared to youth aged 15-19. Youth who were ever forced to perform unwanted sexual acts were more likely to initiate sexual intercourse early, than those who did not; AOR=3.39 and 95%CI [1.66-6.92]

Table 5: Multivariate analysis of factors associated with early sexual debut (N=1,375)

	Bivariate analysis			Multivariate analysis		
	Odds Ratio(OR)	P value	95% CI	Adjusted OR	P value	95% CI
Age of respondent at the time of the survey						
15-19	Ref					
20-24	0.07	<0.001	0.06-0.09	0.055	<0.001	0.01-0.18
Sex of respondent						
Male	Ref					
Female	0.59	<0.001	0.51- 0.70	0.91	0.84	0.38-2.18
Number of sex partner						
One sex partner	Ref					
More than	2.45	<0.001	1.57-3.81	0.12	0.06	0.01-1.15
Wealth index						
Poor	Ref					
Middle	0.93	0.49	1	0.79	0.559	0.36-1.72
Rich	1.21	0.021	1.03-1.47	1.32	0.362	0.72-2.44
Religion						
Catholic	Ref					
Protestant&adventist	0.87	0.076	0.75-1.01	0.97	0.945	0.52-1.81
Muslim	1.1	0.658	0.73-1.65	2.89	0.199	0.57-14.59
Others	2.08	0.027	1.07-4.02	1	1	1
Marital status						
Never married	Ref					
Married&living with partner	0.22	<0.001	0.19-0.27	0.53	0.375	0.13-2.12
Widowed,divorved,separated	0.5	<0.001	0.36-0.70	1	1	1
Age of household head						
20-24	Ref					
25+	0.42	0.013	0.20-0.85	1.56	0.17	1.81-3.00
Sex of household head						
Male	Ref					
Female	1.51	<0.001	1.29-1.77	0.97	0.95	0.36-2.60
HIV comprehensive knowledge						
No	Ref					
Yes	0.72	<0.001	0.62-0.84	0.59	0.069	0.34-1.04

Table 5 Continued

	Bivariate analysis			Multivariate analysis		
	Odds Ratio(OR)	P value	95% CI	Adjusted OR	P value	95% CI
Contraceptive user at the time of the survey						
No user	Ref					
User	0.61	<0.001	0.51-0.72	1.01	0.97	0.58-1.76
Cigarette smoking						
No	Ref					
Yes	1.67	0.061	0.97-2.87	1.63	0.7	0.13-19.92
Partner drink alcohol						
No	Ref					
Yes	1.64	0.048	1.00-2.68	1.38	0.31	0.73-2.58
Ever forced to perform unwanted sexual acts						
No	Ref					
Yes	1.75	0.007	1.16-2.63	2.9	0.003	1.44-5.87

V. DISCUSSION

Our study assessed factors associated with early sexual debut in youth aged 15-24 years in Rwanda using individual-level data collected in a recent nationally-representative survey (RDHS 2014-15).

Although sex is a very sensitive subject and considered as taboo in Rwanda, our results showed that most youth engaged in early sexually activity; multivariate showed that age between 15-19 years was associated with early sexual debut. This reflects findings from several studies where the median age of sexual initiation was below 18years (83–85). In the United States in 2011-13, among the unmarried youth aged 15-19 years, 44% of females and 49% of males had had sexual intercourse (86). Even if it is difficult for our research to demonstrate causality, this can be explained by the hormonal changes and puberty which are factors causally affecting sexual initiation, because these phenomena increase young people’s sexual desire, increase their sexual attractiveness to others, and increase their chances of having sex (87).

We also found that compared to male, females were less likely to initiate early sexual intercourse. However this finding was not significant in multivariate analysis. Many studies showed similar results (16,17,26,49,53,88,89), and some of them explain this by suggesting that males are pressured into very early sexual activity to prove their maturity (45), while others advance the reason that men and boys are exaggerating by reporting their sexual activity history (90). Curiosity emerges as the most common motivation for boys and girls to have first time sex and boys emphasize physical pleasure and elevated status among peers as reasons for sexual activity (49).

Evidences supported that family structure is important to adolescents' sexual behavior (67), and showed significant relationship between age as well as sex of household head and risk of unintended adolescent pregnancy among unmarried adolescent girl (68). In bivariate analysis, our study showed that in households headed by the person aged 25 years and above, youth in these household were less likely to initiate early sexual debut. Studies supported the protective issue of order age of the head of household (66–68,91) in delaying the initiation of first sex of youth.

Youth with HIV comprehensive knowledge were less likely to start sexual intercourse early and this is supported by many researchers (6), even if many other show opposite statement like in a study done in Abuja, Nigeria found that the high HIV/AIDS knowledge level did not translate to low involvement in premarital sex or high condom use, nor did it result to reduced HIV prevalence (70).

Our study found that contraceptive user were less likely to initiate early sexual intercourse and this was confirmed also by a study conducted in Abuja, Nigeria (70), girls who start having sex at 14 or younger are less likely to have used a method at first sex and take longer to begin using contraception in United States (92). However other results from another study conducted in United States showed that 79% of female teenagers and 84% of male teenagers used a contraceptive method at first sexual intercourse.

Among individual factors influencing early sexual debut, bivariate analysis showed that youth in rich category were more likely to initiate sexual intercourse early. A study done in Jamaica found that among adolescent aged 15-19 years, males in the lowest wealth index were less likely than those in the highest to have been sexually active (74). In several countries of sub-Saharan Africa, household circumstances relating to living arrangements and poverty are important pathways to adolescent sexual debut (75,76). A study done in Kenya showed that the odds of early sexual debut among adolescents were more than 60% higher when household characteristics and circumstances relating to wealth, and living arrangements were not satisfied (73).

There was also an association between early sexual debut and the sex of the head of household head, where youth whose households were female were more likely to initiate sex early. Many studies confirmed the role of two parents in delaying sexual intercourse in youth (94). However many showed the role of a father where it was only one parent concerned. Absence of the living biological father from the home was associated with higher risk of sexual debut, regardless of the biological mother's presence in the home (67). In a study done in among adolescents in HIV/AIDS Affected Households in Sub-Saharan Africa showed that adolescent boys who are paternal orphans have about 25 percent higher odds of having initiated sexual activity than their non-orphan counterparts of similar individual characteristics (75), and that when the father is

present in the household (i.e. father only or both parents present), adolescent girls are 42 percent less likely to have ever had sex (69). Contradictory, another study showed that female-headed households were less likely to experience unwanted adolescent pregnancy compared to those of the reference group category (68), and adolescent girls were significantly more likely to debut sexually if neither parent resided in the household, either due to death or other reasons (67).

Multiple sexual partnerships was also shown to be associated with early sexual debut, where youth with more than one sex partner were more than two times likely to early initiate sexual intercourse. Many studies found an interaction between early sexual debut and multiple partnership, and confirmed that early adolescents sexual initiators has an increased likelihood of having multiple sex partners (21,47). In a study done in Vietnam by Dinh Thai Son et al, women who were aged 19 or younger at first sexual intercourse were over five times more likely to have multiple sexual partners, and youth who started sexual intercourse at 10-14 years, the multiple partnership was around six time and more than five time in those who initiated between 15-19 years (64).

Our study found that youth whose sex partners were drinking alcohol were more likely to initiate early sexual intercourse. A study conducted among urban minority youth in United States found that early sexual intercourse initiators had an increased likelihood of having had sex while drunk, and this finding was the same in other studies conducted in Jamaica and in African countries; Burkina Faso , Ghana, Malawi, and Uganda (21,47,48). However our study don't show alcohol use among youth and its association with early sexual debut, because RDHS does not collect this that.

Finding from our study showed also that 12 percent (178/1279) of youth respondents in 2015 RDHS were ever forced to perform sexual intercourse and showed that youth who were ever forced to perform unwanted sexual acts were more likely to initiate early sexual intercourse. A study conducted among African American and White adolescents showed an association between sexual violence and early sexual intercourse (95). In a study conducted in Jamaica found that almost a half of all young women who reported having sex by 14 years agreed ever having experienced sexual coercion or violence (47), while another conducted in South Africa showed that 19.5% of young men who had sex at less than 15 years were not feeling ready and did not

wanted to have sex (2). Results from the study conducted in six Caribbean countries showed also that sex violence was associated with early sexual debut (96).

Strength and limitation of the study

The following points were the strength of the study;

- High response rates, national coverage and representativeness,
- High quality interviewer because they were trained before starting the study,
- Standardized data collection procedures across countries and consistent content over time, allowing comparability across populations cross-sectional and over time

However, there are several limitations on available data on sexual debut among youth as measured by RDHS;

- as our study was cross-sectional on design, it had limitation to do not make causal inference and cannot analyze youth behavior over a period to time
- The DHS survey has been also shown to be exposed to recall biases and memory lapses (97).
- Another limitation is on background variables used in this study which could have changed overtime (approximately 2 years), thereby may not fully reflect the actual status of the respondents at the time of sexual debut. For instance, age, religion affiliation and current residence may be different at the time of the survey from what they wer at the time of sexual debut.
- Another issue is that the age at first sex collected in DHS is self-reporting; boy/men tend to exaggerate it whereas girls/women tend to minimize it.

Conclusion

The main objective of the study was to assess demographic, socio-economic, biological and behavioral factors associated with early sexual debut among youth aged 15-24 years in Rwanda, using secondary data analysis of Rwanda Demographic health survey of 2015

Study population was 15-19 years (53.9 percent) and was female (69.7 percent), many were from rural area (73 percent) and never married (83.4 percent)

This study indicate that a considerable proportion of Rwandan youths engage in sexual activity at an early age and continue to practice risky sexual behaviors as we found that sex partnership was mainly among boy/girlfriends who are not living together and very few used condom at their first sex intercourse.

Young age (15-19 years) of respondents was associated with the odds of having early sexual debut

The final model showed that in the household headed by older people (≥ 25 years) the odds of having early sexual debut in youth was high.

The study found that youth who undergone sexual violence were more likely to initiate sexual intercourse

These findings are nationally representative and useful in identifying target message and activities to help reducing early sexual debut, strengthening implemented measures and orient further researchers.

Recommendation

Based on findings the following recommendation are addressed to the government of Rwanda and Rwanda Biomedical Centre

- Considering the increased proportion of young adolescent aged 15-19 years on early sexual debut, multidisciplinary efforts among others socio-cultural, financial and biological, need to be implemented in order to reinforce the awareness in sexual and reproductive health of youth
- As male were found to initiate early sexual debut than female, effort regarding male gender and sexual behavior is need a particular emphasis
- Considering that youth with HIV comprehensive knowledge were less likely to initiate early sexual intercourse, education on HIV and other sexually transmitted infections need to be reinforce
- It was clear that among youth who engage in early sexual debut, few are using contraceptives. I older to prevent against unplanned pregnancies and their consequences, policies in regard of contraceptives in youth need to be reviewed and fully implemented
- Youth Friendly Centers need to be equipped with sensitization tools and material on sexual and reproductive health
- There is a need of multidisciplinary approach to involve all stakeholders and reinforce social and legal measure set against sexual abuse

Future studies

- There is a need to perform further research in order to deeply explore qualitatively why Rwandan youth are initiating sexual intercourse early, based on the factors shown by this study

- Deep study could also be oriented on analyzing the role of media in increasing the proportion of early sexuality among youth, especially those who use mobile phones and the role of pornographic films

REFERENCES

1. Zaba B, Boerma T, Pisani E, Hill C. Estimation of levels and trends in age at first sex from surveys using survival analysis. 2002;(March).
2. Harrison a, Cleland J, Gouws E, Frohlich J. Early sexual debut among young men in rural South Africa: heightened vulnerability to sexual risk? *Sex Transm Infect.* 2005 Jun [cited 2016 Oct 28];81(3):259–61.
3. Khangelani Z, Geoffrey S, Thomas R, Ntombizodwa M. Age at sexual debut : A determinant of multiple partnership among South African youth. 2010;14(2):46–54.
4. Kaestle CE, Halpern CT, Miller WC, Ford C a. Young age at first sexual intercourse and sexually transmitted infections in adolescents and young adults. *Am J Epidemiol* 2005 Apr 15 [cited 2016 Sep 21];161(8):774–80.
5. Tilahun M, Ayele G. Factors associated with age at first sexual initiation among youths in Gamo Gofa , South West Ethiopia : a cross sectional study. *BMC Public Health.* BMC Public Health; 2013;13(1):1.
6. Tilahun M, Ayele G. Factors associated with age at first sexual initiation among youths in Gamo Gofa, south west Ethiopia: a cross sectional study. *BMC Public Health.* 2013 Jan;13:622.
7. California Bar Foundation. When you turn 18, a survival guide for teenegers.
8. Children’s Institute University of Cape Town. Legal guide to age thresholds for children and young people. 2011;2011(April).
9. Rwanda Ministry of Gender and Family Promotion. National Integrated Child Rights Policy. 2011;(August):1–24.
10. Haannah-Lise T.Schofield et all. Predicting Early Sexual Activity eith Behaviour Problems Exhibited at School Entry and in Early Adolescence. 2009;36(8):1175–88.
11. Lammers C, Ireland M, Resnick M, Blum R. Influences on adolescents’ decision to postpone onset of sexual intercourse: a survival analysis of virginity among youths aged 13 to 18 years. *J Adolesc Heal.* 2000 Jan [cited 2016 Sep 27];26(1):42–8.
12. UNICEF. Ending Child Marriage. Progress and prospects. 2013;
13. Idele P, Gillespie A, Porth T, Suzuki C, Mahy M, Kasedde S, et al. Epidemiology of HIV and AIDS among adolescents: current status, inequities, and data gaps. *J Acquir Immune Defic Syndr.* 2014 Jul 1;66 Suppl 2:S144–53.

14. Tigist B. Early sexual initiation and its associated factors among youth in Addis Ababa , Ethiopia. 2014;
15. Rwanda Biomedical Center. Behavioral Surveillance Survey Among Youth Aged 15 - 24 Years Rwanda - 2009. 2010;(December).
16. NISR. Rwanda Demographic and Health Survey 2014-15. 2014.
17. Ntaganira J, Hass LJ, Hosner S, Brown L, Mock NB. Sexual risk behaviors among youth heads of household in Gikongoro, south province of Rwanda. BMC Public Health. BioMed Central Ltd; 2012 Jan [cited 2016 Jul 12];12(1):225.
18. Rwanda Ministry of Gender and Family Promotion. Strategic Plan for the Integrated Child Rights Policy in Rwanda Ministry of Gender and Family Promotion. 2011;(August):1–54.
19. MOH Rwanda. RAPID ASSESSMENT OF ADOLESCENT SEXUAL REPRODUCTIVE HEALTH PROGRAMS , SERVICES AND POLICY ISSUES IN RWANDA. 2011;
20. UNFPA/WHO. Sexual and reproductive health of young people in Asia and the Pacific. A review of issues, policies and programmes. 2015;
21. O’Donnell L, O’Donnell CR, Stueve A. Early Sexual Initiation and Subsequent Sex-Related Risks among Urban Minority Youth: The Reach for Health Study. Fam Plann Perspect. 2001 Nov;33(6):268.
22. Magnusson BM, Masho SW, Lapane KL. Early age at first intercourse and subsequent gaps in contraceptive use. J Womens Health (Larchmt). 2012 Jan [cited 2016 Jul 12];21(1):73–9.
23. Report MW. Youth Risk Behavior Surveillance — United States , 2013. 2014;63(4).
24. UNICEF. Legal minimum ages and the realization of adolescents’ rights. 2014;
25. Michielsens K, Remes P, Rugabo J, Van Rossem R, Temmerman M. Rwandan young people’s perceptions on sexuality and relationships: results from a qualitative study using the “mailbox technique”. SAHARA J J Soc Asp HIV/AIDS Res Alliance. Taylor & Francis; 2014 Jan [cited 2016 Oct 30];11(1):51–60.
26. Berry L, Hall K. Age at sexual debut. 2011;(2007):1–3.
27. Paquette D, Ryan J. Bronfenbrenner’ s Ecological Systems Theory. 2001;
28. Philip T. Psychosexual Development : Freudian Concept. :180–94.
29. Berk LE. DEVELOPMENT THROUGH THE LIFESPAN, 4/e. 2007.

30. Berne L, Barbara Huberman. *European Approaches to Adolescent Sexual Behavior & Responsibility*. 1999.
31. Dunkel CS, Sefcek J a. Eriksonian lifespan theory and life history theory: An integration using the example of identity formation. *Rev Gen Psychol* . 2009 [cited 2016 Oct 8];13(1):13–23.
32. Macdonald K. *Life History Theory and Human Reproductive Behaviour: Environment/Contextual Influence and Heritable Variation*. 1997;327–59.
33. Qamar L, Husin A. *Father absence and early sexual debut : Understanding the influence of gender , risk , and protective factors*. 2013;
34. Guilamo-Ramos V, Bouris A, Lee J, McCarthy K, Michael SL, Pitt-Barnes S, et al. *Paternal influences on adolescent sexual risk behaviors: a structured literature review*. *Pediatrics*. 2012 Nov [cited 2016 Oct 8];130(5):e1313–25.
35. Krishnan V, Ph D. *Early Child Development : A Conceptual Model * Early Child Development : A Conceptual Model **. 2010;(May):7–9.
36. Rwanda Ministry of Health. *ADOLESCENT SEXUAL REPRODUCTIVE*. 2015;(May 2012).
37. WHO. *Early marriages , adolescent and young pregnancies*. 2011;(December):1–4.
38. UNFPA. *ADOLESCENT PREGNANCY : A Review of the Evidence*. 2013;
39. Skinner SR, Robinson M, Smith MA, Chenoa S, Robbins C. *Childhood Behavior Problems and Age at First Sexual Intercourse : A Prospective Birth Cohort Study*. 2015;135(2).
40. Interpol. *INTERPOL CONNECTING POLICE, SECURING THE WORLD*. 2006;
41. Guttmacher Institute. *American Teens ' Sexual and Reproductive Health*. 2016;(May).
42. Kaestle CE, Halpern CT, Miller WC, Ford C a. *Young age at first sexual intercourse and sexually transmitted infections in adolescents and young adults*. *Am J Epidemiol*. 2005 Apr 15 [cited 2016 Jul 5];161(8):774–80.
43. McGrath N, Nyirenda M, Hosegood V, Newell M-L. *Age at first sex in rural South Africa*. *Sex Transm Infect*. 2009 Apr [cited 2016 Jul 15];85 Suppl 1(3):i49–55.
44. Musiime KE, Mugisha JF. *Factors associated with sexual behaviour among students of Uganda Martyrs University*. *Int J Public Heal Res*. 2015;3(1):1–9.

45. Yeboah E, Maticka- E. Factors Influencing the Timing of First Sexual Intercourse Among Young People in Nyanza , Kenya. 2008;34(4):177–88.
46. Marston M, Beguy D, Kabiru C, Cleland J. Predictors of sexual debut among young adolescents in Nairobi’s informal settlements. *Int Perspect Sex Reprod Health*. 2013 Mar [cited 2016 Jul 12];39(1):22–31.
47. Baumgartner JN, Waszak Geary C, Tucker H, Wedderburn M. The Influence of Early Sexual Debut and Sexual Violence on Adolescent Pregnancy: A Matched Case-Control Study in Jamaica. *Int Perspect Sex Reprod Health*. 2009 Mar;35(01):021–8.
48. Stephenson R, Simon C, Finneran C. Community Factors Shaping Early Age at First Sex among Adolescents in Burkina Faso , Ghana, Malawi, and Uganda. 2014;32(2):161–75.
49. Kempadoo K, Ph D, D LLDP. FACTORS THAT SHAPE THE INITIATION OF EARLY SEXUAL ACTIVITY AMONG ADOLESCENT BOYS AND GIRLS : A STUDY IN THREE COMMUNITIES IN JAMAICA Report to UNICEF and UNFPA Table of Contents. 2001;
50. Jordahl T, Lohman BJ. A Bioecological Analysis of Risk and Protective Factors Associated With Early Sexual Intercourse of Young Adolescents. 2010;31(12):1272–82.
51. Ma Q, Ono-Kihara M, Cong L, Xu G, Pan X, Zamani S, et al. Early initiation of sexual activity: a risk factor for sexually transmitted diseases, HIV infection, and unwanted pregnancy among university students in China. *BMC Public Health*. 2009 Apr 22 [cited 2016 Oct 18];9:111.
52. UNICEF. Sexual exploitation of children across the globe. 2006;
53. Guo W, Wu Z, Qiu Y, Chen G, Zheng X. The timing of sexual debut among Chinese youth. *Int Perspect Sex Reprod Health* 2012 Dec [cited 2016 Oct 28];38(4):196–204.
54. Anglewicz P, VanLandingham M, Phuengsamran D. Rural-to-Urban Migration and sexual debut in Thailand. 2015;51(5):1955–76.
55. Awotidebe A, Phillips J, Lens W. Factors contributing to the risk of HIV infection in rural school-going adolescents. *Int J Environ Res Public Health*. 2014 Nov 14 [cited 2016 Oct 28];11(11):11805–21.
56. Caltabiano M, Rosina A, Dalla-Zuanna G. Interdependence between sexual debut and church attendance in Italy. *Demogr Res*. 2006 May 30 [cited 2016 Oct 28];14:453–84.
57. Fatusi AO, Blum RW. Predictors of early sexual initiation among a nationally representative sample of Nigerian adolescents. *BMC Public Health*. 2008 Apr 25 [cited 2016 Oct 28];8:136.

58. Ogland CP, Xu X. Religious Influences on Delayed Sexual Initiation among Brazilian Adolescents.
59. Okigbo CC, Speizer IS. Determinants of Sexual Activity and Pregnancy among Unmarried Young Women in Urban Kenya: A Cross-Sectional Study. *PLoS One*. 2015 Jan [cited 2016 Oct 28];10(6):e0129286.
60. Agha S. Changes in the timing of sexual initiation among young Muslim and Christian women in Nigeria. *Arch Sex Behav*. 2009 Dec [cited 2016 Oct 28];38(6):899–908.
61. Rwanda Ministry of Education. National School Health Policy. 2014;
62. UNAIDS/RBC. Gender Assessment of Rwanda ' s National HIV Response. 2013;(May).
63. Marston M, Beguy D, Kabiru C, Cleland J. Predictors of Sexual Debut Among Young Adolescents in Nairobi ' s Informal Settlements. 2014;39(1):22–31.
64. Son DT, Oh J, Heo J, Huy N Van, Minh H Van, Choi S, et al. Early sexual initiation and multiple sexual partners among Vietnamese women : analysis from the Multiple Indicator Cluster Survey , 2011. 2016;1:1–6.
65. Lindskog E. Violent Conflict and Sexual Behavior in Rwanda -A possible pathway of HIV transmission. 2013;(August):1–5.
66. Samuel W. Sturgeon. The Relationship Between Family Structure and Adolescent Sexual Activity. 2008;(1).
67. Pilgrim NA, Ahmed S, Gray RH, Al E. Family structure effects on early sexual debut among adolescent girls in Rakai, Uganda. 2015;9(3):193–205.
68. Izugbara C. Socio-demographic risk factors for unintended pregnancy among unmarried adolescent Nigerian girls. *South African Fam Pract. Cogent*; 2015 Feb 25 [cited 2016 Oct 28];57(2):121–5.
69. Ngom P, Magadi M, Owuor T. Parental presence and adolescent reproductive health among the Nairobi urban poor. *J Adolesc Heal*. 2003 Nov [cited 2016 Oct 28];33(5):369–77.
70. Otokpa AO, Lawoyin TO, Asuzu MC. Knowledge on HIV / AIDS and Sexual Risk Behaviour among Pregnant Women in Gwagwalada Area Council of Abuja , Nigeria. 2015;3(3):73–83.
71. UNICEF Nepal. Adolescent development and participation (adap) baseline study. 2014;
72. World Bank. Reproductive Health at a Glance, Rwanda. 2015;(May 2011).

73. Magadi M, Olayo R. Household HIV / AIDS status and sexual debut among adolescents in Kenya. 2011;25(Dec):457–70.
74. Ishida K, Stupp P, McDonald O. Prevalence and correlates of sexual risk behaviors among Jamaican adolescents. *Int Perspect Sex Reprod Health*. 2011 Mar [cited 2016 Oct 28];37(1):6–15.
75. Magadi M a, Uchudi J. Onset of Sexual Activity Among Adolescents in Hiv/Aids-Affected Households in Sub-Saharan Africa. *J Biosoc Sci*. 2015 Mar [cited 2016 Oct 28];47(2):238–57.
76. Kabiru CW, Ezeh A. Factors Associated with Sexual Abstinence among Adolescents in Four Sub-Saharan African Countries. 2009;11(3).
77. WHO/UNAIDS/UNICEF. *Young people and HIV*. 2002;
78. Wand H, Ramjee G. The relationship between age of coital debut and HIV seroprevalence among women in Durban, South Africa: a cohort study. *BMJ Open*. 2012 Jan [cited 2016 Nov 14];2:e000285.
79. Pettifor A, O'Brien K, MacPhail C, Miller WC, Rees H. Early Coital Debut and Associated HIV Risk Factors Among Young Women and Men in South Africa. *Int Perspect Sex Reprod Health*. 2009 Jun;35(02):82–90.
80. Pettifor AE, van der Straten A, Dunbar MS, Shiboski SC, Padian NS. Early age of first sex. *Aids* . 2004 Jul [cited 2016 Nov 14];18(10):1435–42.
81. Winer RL, Feng Q, Hughes JP, O'Reilly S, Kiviat NB, Koutsky L a. Risk of female human papillomavirus acquisition associated with first male sex partner. *J Infect Dis*. 2008 Jan 15 [cited 2016 Nov 14];197(2):279–82.
82. Louie KS, de Sanjose S, Diaz M, Castellsagué X, Herrero R, Meijer CJ, et al. Early age at first sexual intercourse and early pregnancy are risk factors for cervical cancer in developing countries. *Br J Cancer*. 2009 Apr 7 [cited 2016 Nov 14];100(7):1191–7.
83. Richter L, Mabaso M, Ramjith J, Norris S a. Early sexual debut: Voluntary or coerced? Evidence from longitudinal data in South Africa – the Birth to Twenty Plus study. *South African Med J*. 2015 Mar 7 [cited 2016 Nov 8];105(4):204.
84. McGrath N, Nyirenda M, Hosegood V, Newell M-L. Age at first sex in rural South Africa. *Sex Transm Infect*. 2009 Apr [cited 2016 Nov 8];85 Suppl 1(3):i49–55.
85. Reda AA, Lindstrom D. Recent trends in the timing of first sex and marriage among young women in Ethiopia. :1–21.

86. Guttmacher Institute. American Teens ' Sexual and Reproductive Health. 2016;(September):17–20.
87. Kirby D, Lepore G. Sexual Risk and Protective Factors Factors Affecting Teen Sexual Behavior, Pregnancy, Childbearing And Sexually Transmitted Disease: Which Are Important? Which Can You Change? 2007;
88. Eggleston E, Leitch J, Jackson J. Consistency of Self-Reports of Sexual Activity among Young Adolescents in Jamaica. *Int Fam Plan Perspect*. 2000 Jun;26(2):79.
89. Oyedokun AO, Obby C, Demography O. Factors influencing first sexual intercourse for South African youth. 1:1–4.
90. Clark S, Kabiru C, Zulu E. Do men and women report their sexual partnerships differently? Evidence from Kisumu, Kenya. *Int Perspect Sex Reprod Health*. 2011 Dec [cited 2016 Oct 22];37(4):181–90.
91. Goldberg RE. Family instability and early initiation of sexual activity in Western Kenya. *Demography* . 2013 Apr [cited 2016 Nov 9];50(2):725–50.
92. Finer LB, Philbin JM. Sexual initiation, contraceptive use, and pregnancy among young adolescents. *Pediatrics*. 2013 May [cited 2016 Nov 9];131(5):886–91.
93. Wiley DJ, Kaestle CE, Hill C. Sexual Intercourse and the Age Difference Between Adolescent Females and Their Romantic Partners. 2002;304–9.
94. Cort M a., Ramirez O, Chama S. Predicting sexual abstinence among Seventh-day Adventist emerging adults. *Soc Sci J*. 2016 Jun;53(2):199–208.
95. Stueve A, O'Donnell LN. Early alcohol initiation and subsequent sexual and alcohol risk behaviors among urban youths. *Am J Public Health*. 2005 May [cited 2016 Nov 15];95(5):887–93.
96. Peltzer K, Pengpid S. Early Sexual Debut and Associated Factors among In-school Adolescents in Six Caribbean Countries. *West Indian Med J*. 2015 Sep [cited 2016 Nov 15];64(4):351–6.
97. Boerma JT, Sommerfeltb AE. Demographic and health surveys (DHS): contributions and limitations. 1993;46:222–6.

WEBOGRAPHY

1. <http://dhsprogram.com/data/DHS-Survey-Indicators-Other-Proximate-Determinants-of-Fertility.cfm#sthash.IvIdX8wk.dpuf> ,4:02 pm, 24 August 2016