SCHOOL OF PUBLIC HEALTH

COLLEGE OF HEALTH SCIENCES

UNIVERSITY OF GHANA

DETERMINANTS OF ABORTION IN SIERRA LEONE USING THE 2013 DEMOGRAPHIC HEALTH SURVEY DATA

BY

SESAY, FODAY ROBERT

(10639112)

THIS DISSERTATION IS SUBMITTED TO THE UNIVERSITY OF GHANA, LEGON IN PARTIAL FULFILMENT OF THE REQUIREMENT FOR THE AWARD OF MASTER OF PUBLIC HEALTH DEGREE

JULY, 2018

DECLARATION

I hereby declare that with exception of the references made to other peoples‟ work which have been duly acknowledged, this work is the result of my own work done under supervision and that this dissertation has neither in whole or in part been presented to the University or elsewhere for another degree.

Signature …… Date …… / ……... / ……

FODY ROBERTY SESAY

(STUDENT)

Signature ……. Date …… / ……... / ……

PROFESSOR R. M .K. ADANU

(SUPERVISOR)

DEDICATION

This work is dedicated to JESUS the pillar of my life, to my parents, Mr. Alimamy Bobson Sesay, Mr. Joseph Salamie and Mrs. Hannah Salamie and to my dear wife, Mrs. Hurianatu Sesay and my kids.

ACKNOWLEGMENT

I wish to express my sincere gratitude to my academic supervisor, Professor Richard Adanu, Dean of School of Public Health, University of Ghana for his relentless guidance, corrections and constructive criticism throughout the supervision of this thesis.

My heartfelt appreciation to Professor Kwesi Torpey, Head of Department, Population Family and Reproductive Health department (PFRH), School of Public Health for his academic support and motivation to the completion of my study.

My profound appreciation goes to Professor Anna Thorson and team, Reproductive health department, World Health Organisation for providing all the funds needed throughout this course. Also special thanks goes my dear friends Dr. Suzanna McDonald and Emefa Modey for their constructive criticism.

Many thanks to Statistic Sierra Leone, for making available the 2013 Sierra Leone Demographic Health Survey data

Finally, I want to thank my wife, Hurianatu for her prayers and support and my lovely kids.

TABLE OF CONTENTS

LIST OF TABLES

LIST OF FIGURES

LIST OF ABBREVATIONS

AIDS	Acquired Immune Deficiency Syndrome
AOR	Adjusted Odds Ratio
CI	Confidence Interval
DHS	Demographic Health Survey
FGM	Female Genital Mutilation
HIV	Human Immunodeficiency Virus
HPV	Human Papilloma Virus
HSV	Herpes Simplex Virus
ICPD	International Conference on Population and Development
MMR	Maternal Mortality Ratio
OR	Odds Ratio
SA	Spontaneous Abortion
SLDHS	Sierra Leone Demographic and Health Survey
SE	Socioeconomic status
SSL	Statistics Sierra Leone
STI	Sexually Transmitted Infection
TOP	Termination of Pregnancy
UNDP	United Nations Development Bank
UNICEF	United Nations Children Fund
UNFPA	United Nations Development Program
WHO	World Health Organization

ABSTRACT

BACKGROUND: It is estimated that a woman dies every eight minutes somewhere in a developing country as a result of unsafe abortion. Sierra Leone is classified as a category two under the world‟s abortion laws meaning abortion is only permitted when it is performed to protect a woman‟s life and health. It has some of the worst maternal health indicators in sub-Sahara Africa- whilst the regional Maternal Mortality Ratio (MMR) is 647 deaths per 100,000 live births, the country has 857 deaths per 100,000 live births. The above situation has been compounded by the fact that the health system is not functioning properly. The civil war (1991-2002) and the Ebola outbreak (2014-2015) have resulted in the loss of both human resources and the physical infrastructure of the health system. Recent report shows one in seventeen women of reproductive age in Sierra Leone have a lifetime risk of death associated with childbirth.

OBJECTIVE: To assess the determinants of abortion in Sierra Leone using the 2013 Demographic Health Survey data.

METHODS: Data from 9,535 female respondents of the 2013 Sierra Leone Demographic Health Survey were used. The outcome measure is women who ever had a terminated pregnancy. Stata SE version14 was used to analyse the data. Chi-square, Fisher exact test and logistic regression models were used to determine associations between selected variables and outcome measure.

RESULTS: The following demographic variables significantly influenced abortion; age ($\chi2$=158.9578, P< 0.001), education ($\chi2$=37.3905, P<0.001), marital status ($\chi2$= 83.4940, P<0.001), age group at first sex ($\chi2$= 127.2242, P<0.001), religion (P=0.001), knowledge of family planning methods ($\chi2$= 6.2044, P=0.013) and contraceptive use ($\chi2$= 6.2156, P=0.013). The associations between the following were found not to be significant: place of residence

($\chi 2$=3.3360, P=0.068), region ($\chi 2$=6.9998, P=0.072) and types of contraceptive methods used ($\chi 2$=7.0866, P=0.069). A significant number of abortion cases were reported among women above 25 years old, married, uneducated, employed, Muslims and those residing outside the capital city (Freetown).

CONCLUSION:

Researchers have long identified the association between unsafe abortion and maternal mortality and morbidity. Continuous dialogue and debates would help women contribute to the challenges of unsafe abortion by openly voicing out their opinions and views on abortion. Legalizing abortion in developing countries and provision of affordable contraceptives are key steps to reducing its adverse effect.

DEFINITION

Abortion: An abortion is the premature exit of the products of conception (the foetus, foetal membranes, and placenta) from the uterus i.e. the loss of a pregnancy. It can be spontaneous (miscarriage) or induced.

Induced Abortion: An abortion that is brought about intentionally. It is also called artificial or therapeutic abortion.

Spontaneous Abortion: (SA) Any pregnancy that is not viable (the foetus cannot survive) or in which the foetus is born before the 20th weeks of gestation.

Abortifacient: An agent or drug which may induce abortion.

Contraceptive: Any method, drug or device that helps prevents conception.

Illegal Abortion: Termination of pregnancy without legal justification

Legally Restricted Abortion: Abortion allowed only under a specific set of conditions and decreases access to services. As a result, women are more likely to seek illegal abortions. Legally restricted abortion is associated with a high incidence of unsafe abortions.

Post Abortion Care (PAC) ; A comprehensive services for treating women that present to health care facilities after abortion has occurred spontaneously or after an attempted termination

Unsafe Abortion: Abortion is unsafe when it is carried out either by persons lacking the necessary skills or an environment that does not conform to the minimal medical standards or both.

Unintended pregnancy; occurs when a woman want to postpone conception for at least two years or did not want to become pregnant at the time

CHAPTER ONE

INTRODUCTION

1.1Background of the study

Termination of pregnancy (abortion) can either be a spontaneous event or induced for therapeutic or elective reasons. This thesis will focus on both. By definition, abortion is the expulsion of the foetus from the womb during the first twenty-eight (28) weeks of pregnancy (Mohamed et al., 2015). Women throughout the world are faced with issues of unwanted pregnancy; some of these women seek to get rid of the pregnancy by safe medical means if available but quite often, they resort to whatever means is available.

"Induced Abortion" is generally a common event that happens in every society. It is performed with highly varied techniques and under different circumstances. The onset of induced abortion existed even before history started recording it, and it is still existing (Hornby A. S., 2013). Spontaneous abortion (SA), otherwise referred to as a miscarriage, is among the frequently encountered problem faced by women during early pregnancy. It occurs in at least 15– 20 % of all recognized pregnancies and it is predominately due to chromosomal abnormalities and hormonal problems (Zheng, Li, Wu, & Tang, 2017). Induced abortion is still an issue of great public health concern in low and middle-income countries. It is estimated that a woman dies every eight minutes somewhere in a developing country as a result of unsafe abortion (World Health Organisation, 2007). China"s estimate of SA stands at 6-15% of all clinically diagnosed pregnancy. If we consider early pregnancy losses the number is thought to be much higher (Zheng, Li, Wu, & Tang, 2017) "A teenage girl living in a rural area with little knowledge and support to deal with her unplanned pregnancy, either after being raped, accidental pregnancy due

to the failure of contraception methods, or incorrect use of the contraceptive may resort first to self-induce termination. If this fails she turns to an unskilled, and/or relatively inexpensive provider. This is exactly the real-life story of so many women in developing countries even after marked improvement in technologies and public health"(World Health Organisation, 2007).

The World Health Organisation has reported that countries with restrictive laws on induced abortion tend to have a high unsafe abortion and maternal mortality ratio (Grimes et al., 2006). In Sierra Leone women faced with unintended pregnancy result to induced abortion for the following reasons; the economic stresses, lack of partners support, untimely pregnancy and rape or incest pregnancy (Statistics Sierra Leone and ICF International, 2014). Irrespective of restrictive laws on abortion, women can self-induce or find a health care worker to perform an induced abortion when faced with an unplanned pregnancy. Worldwide, the total cases of abortion performed safely and unsafely surmount to 44 million (Sedgh et al., 2012). Socioeconomic status (SE) has shown to play an influential part in the health and life expectancy of a pregnancy. People with low (SE) are more likely to show a risky behavioural pattern and limited opportunities to proper health services (Baba et al., 2011). However, only a few studies have investigated the relationship between SE and SA (Dahlba, 2010; Luiza et al., 2015; Zheng et al., 2017).

In 2007, the World Health Organisation (WHO) reported that much information on abortion practices are either not available or are inaccessible. This has resulted in difficulty in quantifying and classifying abortion. The limited and unreliable information on abortion is because of the legal, ethical and moral consideration (World Health Organisation, 2007). Also, the actual records of abortion in hospitals tend to be either unreported or under-reported. In fact, the hospital records do not involve women who don‟t seek post-abortion care in hospitals (Paul et

al., 2015). The world‟s burden of disease is largely shared by the African continent. Africans have achieved significant improvement in transforming policy, providing information and safe technology for abortion care (World Health Organisation, 2007). The stigma and silence that surrounds abortion were partly lessened following the 1994 international conference on Population and Development (Brookman-Amissah & Moyo, 2004). An important cause of maternal mortality and morbidity is the continuing practice of unsafe termination of pregnancy (TOP). As stated by Singh and Maddow (2016) maternal death from different methodologies of unsafe abortion ranges from 8% to 15 %. Although the worldwide maternal mortality ratio has shown a steady decline, the pieces of evidence on morbidity from unsafe TOP still remain prevalent (Susheela Singh et al., 2010). An estimate of 10 per 1000 women of reproductive age or 163,000 women were hospitalised for induced abortion in 2005, in East Africa. Worldwide, an estimate of one-third of the 8.5million women with abortion complication where not treated in facilities (S. Singh & Maddow-Zimet, 2016). Similar trends in mortality were observed in Ghana (Ghana Statistical Service, 2009) . This causes serious public health implications for the country, as it increases the maternal mortality and morbidity. The report claims that induced abortion is a cause of maternal death; accounting for eleven per cent of the Maternal Mortality Ratio (MMR). Also, it stated that 15% were found to have sought induced abortion from an available healthcare provider.

Sierra Leone is a West African country bordered by Guinea, Liberia and the Atlantic Ocean. It has a population of about 7,092,113 as revealed by the 2014 census (Statistics Sierra Leone and ICF International, 2014). In 2002 the Sierra Leone Ministry of Health and Sanitation developed a National Health Policy which was revised in 2009 to outline the priority problems and provide a common strategic framework of intervention. The above was also complemented by the

initiation of free maternal and under-five health care services in April 2010 (Ministry of Health and Sanitation, 2016). Two major events in Sierra Leone‟s history have contributed to shaping the present state of the country‟s health service delivery (Ministry of Health and Sanitation, 2016). The civil war (1991-2002) and the Ebola Virus Disease (EVD) outbreak (2013-2016). The latter affected both human resources and the physical infrastructure of the health system. It caused a fall in real GDP growth from 4.6% in 2014 to -20.6% in 2015. It also resulted in the country been ranked in the bottom 10 least developed countries in the world according to the 2015 data on economic and human development. It GDP per capita was $653 per person per year (Ministry of Health and Sanitation, 2016).

1.2 Problem statement of the study

The WHO estimate that 24 out of 1000 African women age 15-44 years have an unsafe abortion every year (World Health Organisation, 2014). Statistics have shown that induced abortion that is considered" unsafe" contribute approximately thirteen per cent to the global maternal death. (Brookman-Amissah & Moyo, 2004). Studies were done in Kenya and Ethiopia which shows the mortality due to unsafe abortion was over 33% in Kenya and 50% in Ethiopia respectively (Fetters, Abdella, & Kumbi, 2008). It is approximated that, of the 205 million pregnancy which occurs worldwide, more than one third are unintended. Also, in Africa, of the 182 million pregnancy that occurs yearly, more than one-third of these pregnancies are unintended, with 19% ending in induced abortion, (8% safely and 11 % unsafely) (Klutsey & Ankomah, 2014).

Sierra Leone is classified as a category II under the world‟s abortion laws (Center for Reproductive Rights, 2009). This means that induced abortion is only permitted when it is performed to protect a woman‟s life and health. Sierra Leone has some of the worst maternal health indicators in sub-Sahara Africa (Statistics Sierra Leone (SSL) and ICF Macro., 2009). The

country‟s restrictive law with limited access to sexual and reproductive health services and low contraceptive use means that many women with unplanned pregnancy will resort to unsafe induce abortion (Statistics Sierra Leone and ICF International, 2014). Whilst the regional Maternal Mortality Ratio (MMR) stands at 647 deaths per 100,000 live births the country‟s MMR is 857 deaths per 100,000 live births (Statistics Sierra Leone (SSL) and ICF Macro., 2009). Women in Sierra Leone and many African countries are faced with limited options when it comes to unwanted or unexpected pregnancy. It is an issue that is rarely talked about openly in Sierra Leone. The secrecy attached to abortion has led to women making uninformed decisions, as they lack appropriate information from reliable sources (Statistics Sierra Leone and ICF International, 2014)

Data from the „Maternal Death Surveillance and Response 2016‟ report indicate that spontaneous abortion forms 2% of the total maternal death that was reviewed (Ministry of Health and Sanitation, 2016). Few studies, if any, have tried to address the impact of morbidity from the consequences of unsafe abortion. This includes acute and chronic pelvic infection, infertility and the cost implication of unsafe abortion for health providers. The effect on women‟s health, their loved ones and societies, and on the scarce resources of the health system is undeniably enormous. (World Health Organisation, 2007). Induced abortion is allowed in the majority of African countries when it is performed to protect maternal life only.

The Sierra Leone law frowns on abortion, even when social activists have continuously advocated for it to be removed from the law books, in effect limiting women‟s access to only safe, legal abortion services in cases where it is necessary to save the mother‟s life and physical or mental health (Paul et al., 2015). Furthermore, women faced with complications of unsafe abortion avoid seeking care for fear of being prosecuted by the police. This has placed healthcare providers in a state of dilemma, between saving their patients life and the legal system (Paul et al., 2015).

In Africa, about 67% of unintended pregnancies occur among women who are not practising contraceptive use. (Lamina, 2015). It is estimated that more than 100 million married women in developing countries have an unmet need for contraception, which implies that, they don‟t use either local or modern methods, are sexually active and yet they don‟t want to have a child soon or at all (Guttmacher Institute., 2007). The Sierra Leone situation indicates that less than one-third of currently married women has an unmet need for family planning (12 %) (Statistics Sierra Leone (SSL) and ICF Macro., 2009). However changing the law is only the beginning, and by itself is no guarantee that unsafe abortion will cease to exist because there are so many other contributing factors like traditional, cultural and economic factors (Cohen, 2009). In fact, the public perception about abortion is ill-informed. The general public has little knowledge of it, and even when they do, the information varies amongst subgroups of the population (Cohen, 2009). In Sierra Leone there is minimal well documented and recent assessment which focuses on induced abortion, it complication and the restrictive laws attached to it.

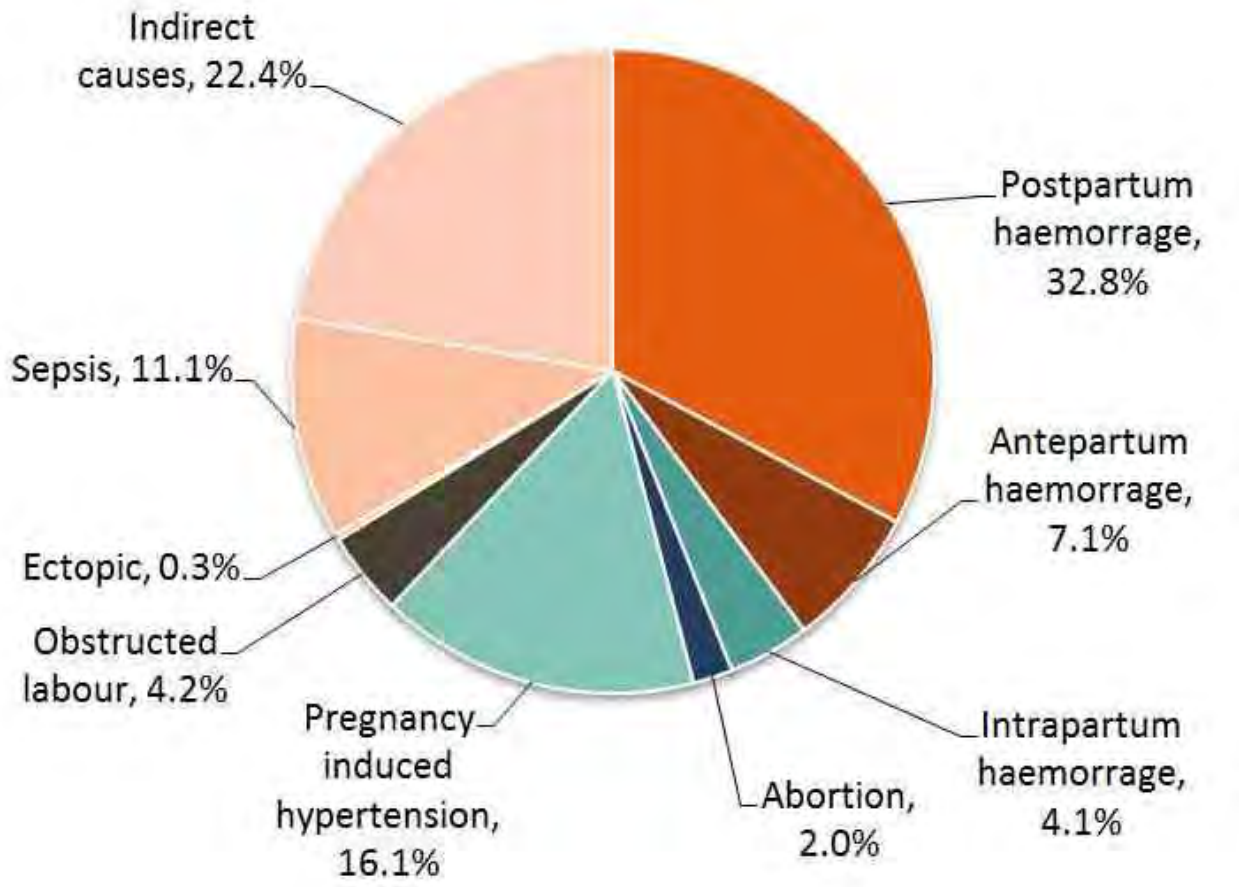

Figure 1.2.1 Causes of death as recorded by Maternal Death Surveillance and Response

1.3 Justification for the study

Studies have been conducted on the burden and complications of induced and SA, to explain the cost and the effect on healthcare resources (Ilboudo, Greco, Sundby, & Torsvik, 2017; Leone, Coast, Parmar, & Vwalika, 2016). In Sierra Leone, studies have been done to examine why women resort to abortion especially from unskilled providers and the knowledge and use of contraceptive (Paul et al., 2015). There is the perception that abortion (spontaneous and induced) is high in Sierra Leone especially among adolescent girls although little has been done in this area.

According to the report published in "trends in maternal health indicator in Sierra Leone, 2008-2013", WHO state that, the MMR in Sierra Leone was estimated to be 1,360 (95% C.I.: 999, 1980) in 2015, compared with an estimate of 2,630 in 1990 (95% C.I.: 1780, 2640) (Assaf & Winter, 2015). Recent report shows 1 in 17 mothers in Sierra Leone have a lifetime risk of death associated with childbirth (Ministry of Health and Sanitation, 2017). Due to the recent EVD outbreak, the 2015 report on maternal mortality trends worldwide did not report on Sierra Leone (WHO, UNICEF, UNFPA, World_Bank_Group, & UNPD, 2015), however, it is expected that the MMR will continue to increase. This study seeks to provide evidence-based information on the determinants of abortion which is a contributing factor to maternal mortality.

1.4 Conceptual framework

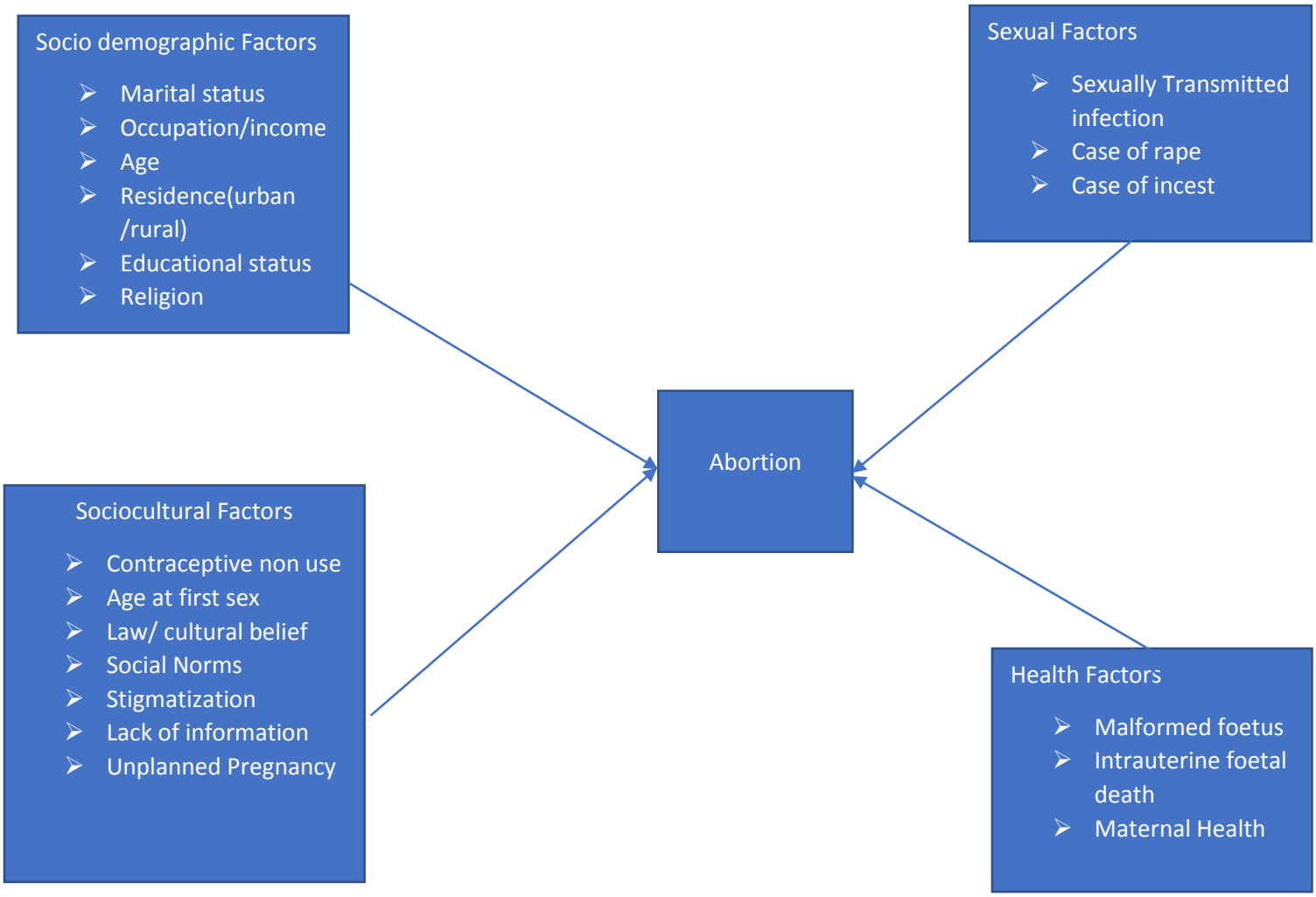

Figure 1.4.1 Conceptual framework on the Determinants of Abortion

1.5 Narrative of Conceptual Framework

Abortion can either be spontaneous or induced. It influenced by several factors. These include socio-demographic factors (which involve marital status, income level, level of education, place of residence and age). The Sociocultural factors (in cases of stigmatisation, poor economy, contraceptive use, abortion laws, cultural beliefs, unplanned pregnancy, age at first sex and social norms), will have an effect on induced abortion. Spontaneous abortion will be affected by chronic sexually transmitted infections, foetal malformation, psychological stress, and lifestyle choices such as alcohol intake and smoking. For causes of abortion due to sexual factors and maternal safety (which include intrauterine foetal death, ectopic pregnancy, incest and rape), they can have an effect on both spontaneous and induce abortion. Seeking abortion from providers for legal or illegal purposes means it can be influenced by appropriate information and service regulatory body, social norms and religious beliefs.

1.6 Study Objectives

1.6.1 General Objectives

To assess the Determinants of Spontaneous and Induced abortion in Sierra Leone using the 2013 Demographic Health Survey data.

1.6.2 Specific Objectives

1. To examine which demographic variables significantly influenced abortion
2. To assess how contraceptive non-use influenced abortion.
3. To assess the effect of women‟s socio-economic status on abortion.

1.6.3 Research Questions

1. What demographic variables are associated significantly with abortion?
2. How is contraceptive non-use associated with abortion?
3. How socio-economic status influenced abortion?

CHAPTER TWO

2. 0 LITERATURE REVIEW

The main search engine for the majority of articles used is the Google Scholar and research gate. Databases such as PubMed, Elsevier, Jstor, Science Direct and Wiley online library are some of the sources for retrieving the articles through the University of Ghana access. Search terms include determinants of abortion AND developing countries, abortion in Africa AND risk factors, and determinants of abortion AND Sierra Leone.

2.1 Reproductive Health Rights.

WHO defines unsafe abortion as "a procedure for terminating the unintended pregnancy carried out either by a person lacking the necessary skills or an environment that does not conform to minimal medical standards or both" (World Health Organisation, 2014). An individual‟s health has been established to have an association with their SE, indicated by their level of wealth, education and occupation‟ (Zheng et al., 2017)

More than a decade ago, at the International Conference on Population and Development (ICPD), held in Cairo, 179 countries agreed that: "(a) All couples and individuals have the right to decide freely and responsibly the number, spacing and timing of their children, and to have the information and means to do so; (b) Decisions concerning reproduction should be made free from discrimination, coercion and violence"(UNFPA, 2008). A major breakthrough at the ICPD, reaffirmed repeatedly since, is that these services are essential for all people, married, adolescents and youth. For people to realize their reproductive rights, the ICPD „Programme of Action‟ calls for and defines the following; "(a) Family planning; (b) Antenatal, safe delivery and post-natal care; (c) Prevention and appropriate treatment of infertility; (d) Prevention of

abortion and management of the consequences of abortion; (e) Treatment of reproductive tract infections; (f) Prevention, care and treatment of Sexually Transmitted Infections (STIs) and Human Immunodeficiency Virus (HIV) /Acquired Immune Deficiency Syndrome (AIDS); (g) Information, education and counselling, as appropriate, on human sexuality and reproductive health; (h) Prevention of violence against women, care for survivors of violence and other actions to eliminate traditional harmful practices, such as Female Genital Mutilation/C; (i) Appropriate referrals for further diagnosis and management of the above"(UNFPA, 2008).

2.2 Types of abortion

a. Safe Abortion

Abortion is safest when performed early in a pregnancy. The length of a pregnancy is measured from the first day of a woman‟s last menstrual period (Population Reference Bureau, 2006). Safe methods of abortion used during the first trimester (12 weeks) of pregnancy are vacuum aspiration, dilation and curettage, and medication abortion (Population Reference Bureau, 2006).

b. Unsafe Abortion

Where abortion is restricted by law, girls and women who can afford to pay for services can often find a private physician, or sometimes a nurse or midwife, willing to perform a safe abortion (Paul et al., 2015). Women who cannot afford or cannot access these services may try to abort the pregnancy themselves, or they may turn to unskilled practitioners (including traditional or religious healers, homeopaths, and herbalists) who use a variety of methods (Population Reference Bureau, 2006) .

2.3. Abortion Methods

Although the Demographic Health Survey data does not differentiate between induced and SA, a few qualifications need to be made to the distinction between induced and SA, even though it may lead to an upward bias to the number of reported cases of SA. In Sierra Leone, a SA does not have the stigma that is attached to induce abortion, and in several cases, women may report an induced abortion as a SA. Induced abortion in the face of family pressures and economics stresses may be reported by women as a SA. Methods to terminate an unwanted pregnancy are known to have existed since ancient times. There are about 100 methods of induced abortion which can be categorised broadly into (1) oral and injectable medicines; (2) vaginal preparations; (3) introduction of foreign bodies into the uterus and (4) trauma to the abdomen (World Health Organisation, 2007).

2. 4 Theoretical overviews; Ethical Debate over abortion

The subject of induced abortion is shaped by multiple dynamics including moral, social, religious, political and legal perspective. It is a topic that has been debated for decades by the illiterate and educated because it involves the definition of life and the value of human rights. It involves two sides, the pro-life and the pro-choice advocates (Lowen, 2008)

a. Pro-Life

Individuals who believe in pro-life feel threatened if their reproductive rights are taken away by allowing the government to decide what medical options should be undertaken. They believe a person should have the right to decide on the number and spacing of one‟s children (Lowen, 2008)

b. Pro-Choice

Women who are pro-choice activists believe that fetuses are only potential human beings. They only have legal right when they become viable, that is, able to survive outside its mother‟s womb. Until such a time the fetus has no legal rights – the rights belong to the women carrying the foetus. As part of a woman‟s civil right, the ability to have control of her body is critical. Pro-choice defenders believe that abortion creates stress for women. Teenagers who became mothers have grim prospects for the future (Lowen, 2008)

c. Feminist

A feminist is pro-woman rather than pro- or anti-abortion. They view the right to an abortion as a woman‟s right to sovereignty. As a basic right to control her own body, feminism seeks to help women gain access to safe and legal abortion. Prior to legal abortion, women had a minimal choice to the outcome of an unwanted pregnancy. They either underwent an unsafe, illegal abortion that put their bodies at risk, or they keep the pregnancy. If women had not been given the right to choose, they would have become mere vessels of reproduction. According to a feminist activist, abortion has become “a thorn in the flesh”, as both ends (spontaneous and induced) seems to deprive the women of their fundamental right. (Pomeroy Claire, 2008).

d. Religious view on Abortion

Abortion has been debated widely in religious domains, it has a huge concern and is widely deliberated topic amongst different religion. However, every religion has taken a strong position on abortion. It is a major religious concern because it covers salient issues of life and death, right and wrong and human relationships. Abortion practice affects women emotionally and spiritually (Küng et al., 2018). Tom et al., (2010) states that the Bible‟s position on abortion is like its position on so many other issues, which can be described as extremely ambiguous. It refers to

abortion as non-intentional or accidental killing and does not spell out punishment for women involving in induced abortion. That is why the Judeo-Christian tradition has long struggled with the question of induced abortion. The Roman Catholic Church, unlike other religions, does not believe in quickening which occurs around week 20 (the point in pregnancy when a foetus begin to move). They hold the belief that, the soul is implanted at the moment of conception. The Muslim Scholars also have different opinions on the topic of induced abortion. Most agreed that a foetus becomes a living soul after four months, hence termination of pregnancy before this period is permissible, especially when it is performed to protect the life of the mother (Tom, 2010).

2.5 Socio-demographic Determinants of Abortion

Some demographic determinants associated with induced abortion are modifiable. In Ghana, report from Klutsey et al., (2014) in a quantitative, hospital-based, unmatched case-control study of eight hospitals found a 4% reduction in the odds of an induced abortion in married women compared with women who were single (odds ratio [OR] 0.11, 95% confidence interval [CI] 0.07–0.22). Unemployed women of reproductive age were found to be 0.35 times less likely to seek induced abortion compared with their employed counterparts (OR 0.35, CI 0.19–0.65). Also, they observed that women with no knowledge of contraceptive method were 4.6 times likely to seek induced abortion (OR 4.64, CI 1.39–15.4), compared with women who had knowledge of contraceptive method. A similar association with increased abortion rate was seen among female workers in Cambodia (Sopheab, Tuot, Chhea, & Gorbach, 2015). Luiza et al., (2015) conducted a prospective cohort study in Brazil to assess whether contraceptive use is associated with access to family planning services in the six-month period post-abortion. They found that women who reported utilization of both contraceptive and counselling in the same

month had higher odds of reporting contraceptive use during the six-month period post-abortion when compared with those who did not use these family planning services [adjusted an OR = 1.93, 95 % CI: 1.13–3.30].

A nationally representative survey of 313 health facilities was conducted in Uganda in 2003 to determine the number of induced abortions performed annually, using stratified multistage sampling (Susheela Singh, Prada, Mirembe, & Kiggundu, 2005). They showed a significant association between abortion and the following: maternal age, marital status, contraceptive use and place of residence; Abortions occur at a rate of 54 per 1,000 women aged 15–49 years and the abortion rate is higher than average in the Central region (62 per 1,000 women), the country‟s most urban and economically developed region compared to the rural areas (43 per 1,000 women). 51% of married women aged 15–49 and 12% of their unmarried counterparts have an unmet need for effective contraceptives (Susheela Singh et al., 2005).

Hosseini H et al., (2017) in Iran conducted a study involving a representative sample of 3,000 married women aged 15-49 years to examine factors associated with the incidence of abortion using logistic regression models. They found that the incidence of abortion was strongly associated with women‟s education, type of contraceptive and family income level, after controlling for confounding factors. Induced abortion was associated with women having a higher standard of education, those using long-acting contraceptive and those with a better income level. A cross-sectional study of the association between SA and SE in Beijing, China (Zheng et al., 2017) observed a strong association between SA and the following; income level, place of residence and level of education; Low-income women were found to have an increased risk of SA compared to high income (AOR = 0.90, 95% CI: 0.84–0.97. The risk of SA in rural was 1.68 times greater than in urban (AOR = 1.68, 95% CI: 1.54–1. Also an association between

education and SA was found in urban (AOR = 0.66, 95% CI: 0.55–0.78) but not in rural (AOR = 1.05, 95% CI: 0.34–1.17). Ibrahim et al., (2011) did an analysis on a four-years retrospective study of complicated abortion cases treated at the Niger Delta University Teaching Hospital. They reported that the proportion of respondents who had secondary education, teenagers and uses a contraceptive method were 55.6%, 31.8% and 87.3% respectively (Ibrahim, Jeremiah, Abasi, & Addah, 2011). A study conducted in Nigeria (Otoide, Oronsaye, & Okonofua, 2001) to determine why, it is important to investigate adolescents‟ perceptions concerning the risks of contraceptive use versus those of induced abortion showed significant associations between age at first sexual intercourse, lack of appropriate information, contraceptive non-use and induced abortion.

2.6 Socio-Cultural Determinants of Abortion

Socio-cultural determinants of abortion have been a significant contributing factor for continued induced abortion practises throughout the world. In Nigeria, Koster et al (2010) found a significant association between induced abortion and the following; stigma, cultural norms and belief and religion. In the Yoruba society, for unmarried women, pregnancy is a proof of them having violated societal norms against premarital sex, therefore to advert the shame of having transgressed society rules they result in induced abortion. Some young single women even involved their parents. Also due to the approximately three year‟s norm of birth intervals, married women resort to induced abortion for fear of gossip that they cannot restrain themselves sexually. As a predominately Muslim community which frowns on abortion in unmarried women, women tend to seek abortion services from traditional healers in neighbouring communities for fear of being reported to the authorities. Similar determinants were found to be

strongly associated with induced abortion in another study (Bankole, AkinrinolaOye-Adeniran, Singh, & Adewole, 2006).

A retrospective review of facility registers and logbooks of all obstetric admissions in Sierra Leone, (Paul et al., 2015) revealed that abortion is tolerated when is performed by skilled personnel in a government hospital or registered private hospital or clinic and in cases where the pregnancy pose a risk to the women life; injury to her physical and mental health. Also, pregnancy resulting from rape, defilement of a female idiot or incest are aborted without any criminal offence been levied against the provider. It is the same also for pregnancy with serious abnormalities and disease. This situation above is not different from other African countries e.g. Ghana (Lithur, 2004) and Nigeria (Otoide et al., 2001). Sedgh et al., (2006) conducted a community-based, cross-sectional survey in Nigeria using logistic regression to assess the incidence of seeking an abortion among women; with unwanted pregnancies and the factors associated with unwanted pregnancy and abortion-seeking behaviour. They found that the most common reason why Catholic women resort to abortion was not being married (34%), and for Muslim women was to stop or space births (31%). When asked to mention reasons other than their primary reason for seeking to end their last unwanted pregnancy, an uncommon reason which came up among married women was infidelity.

2.7 Reasons Why Women Resort to Abortion

This section explores the reasons why women resort to abortion especially considering the potential consequences. Sedgh et al., (2006) showed that the fear of being single mother is the most common reason for terminating a pregnancy. Also, 30% cited being young to carry the responsibility of child as bearing the reason. Lack of finance is another reason given by young

girls for wanting to terminate a pregnancy. They said it will be difficult for them to take care of themselves and the infants when they do not have a regular source of finance (Ibrahim et al., 2011).

Chae et al., (2017) examined a nationally representative data on 14 countries on "reasons why women have induced abortion". They observed that the circumstances surrounding women‟s abortion decision making includes; interference with future opportunities (54%), partners related concerns (55%), desire to postpone childbearing (60%) and lack of financial preparedness (32%). In older married women, a commonly cited reason was limiting childbearing. In Sierra Leone, girls are expelled from school once the school finds out that they are pregnant, there is no provision for a teenager to complete her education after delivery and the fear of expulsion from school are reasons for her to resort to abortion (Paul et al., 2015). The reasons given by girls for wanting to terminate a pregnancy are similar to reasons given in other studies (Bankole, AkinrinolaOye-Adeniran et al., 2006; Koster, 2010).

Sexual violence is another reason why women resort to abortion. It can be defined as "any sexual act, attempt to obtain a sexual act, unwanted sexual comments or advances, or acts to traffic, or otherwise directed, against a person‟s sexuality using coercion, by any person regardless of their relationship to the victim, in any setting, including but not limited to home and work place" (World Health Organisation, 2002). Columbia et al., (2007) conducted a study in Machinga district, Malawi on sexual harassment and abuse among primary school girls. They reported sexual comments, rape and coerced or unwanted pregnancy in 7.8 %, 13.5 %, and 1.3 % of the respondents respectively. The study showed a direct relationship between sexual violence, rape and induced abortion (Columbia, Kadzamira, & Moleni, 2007).

2.8 Legal status of Abortion

The analysis shows that countries with less restrictive abortion laws have about four times lower the average rate of unsafe abortion compared to countries with more restrictive laws (Johnson, Mishra, Lavelanet, Khosla, & Ganatra, 2017). Restrictive abortion laws are also associated with higher levels of maternal mortality. The average maternal mortality is three times lower in countries with less restrictive abortion laws (77 maternal death per 100 000 live births) compared to countries with more restrictive laws (223 maternal death per 100 000 live births). These restrictive laws and policies cause a delay for women receiving care within the formal Heath system because they include policies that limit provision of abortion care to obstetrician and gynaecologist; mandatory counselling and waiting periods; unnecessary medical tests and requirements for third party authorization. Such delays only worsen the situation, since its result in pregnancy advancing beyond legally allowed gestation limits, thus rendering women ineligible to receive safe service (Johnson et al., 2017; United Nations, 2014).

In Sierra Leone, the government is yet to approve "The Safe Abortion Act" a bill that will see the legalization of abortion putting an end to the earlier English offences Against the Person Act of 1861. As a nation with one of the worst maternal mortality indices, the signing of this new bill will be of great help (Ministry of Health and Sanitation, 2016). "The restrictive abortion laws that still prevail in almost all the countries on the African continent are a major cause of unsafe abortion. These laws have all been inherited from pre-independence colonial laws. There were five such models, deriving from the laws of France, England, Belgium and Portugal, the major colonial powers, and from the Dutch-Roman law as practised in South Africa. These can be divided into two broad categories, those based on civil law (France, Belgium and Portugal), and

those based on common law (England and South Africa)" (Brookman-Amissah & Moyo, 2004). According to (Berer, 2004) countries that allow abortions on demand shows maternal mortality rate as low as 1 as or less per 100,000 live births. While on the other hand countries where abortion remains illegal, continues to have the highest burden of unsafe abortion and maternal mortality rate of 34 deaths per 100,000 live births. Our social norms and culture, religious restrictions together with the law make abortion highly criminal and left to be performed by traditional leaders who lack the necessary competencies to perform the procedure.

2.9 Impact of unsafe Abortions on the reproductive health of the women

According to each country, the percentage of maternal death due to unsafe abortion varied greatly. Eastern Africa has the highest, 17%. Worldwide, an estimated five million women are hospitalized each year for treatment of abortion-related complications, such as haemorrhage and sepsis (World Health Organisation, 2007). Some factors contributing to mortality and morbidity from unsafe abortion are; the method used, the state of the pregnancy and general health of the woman, the abortion provider‟s facilities and skills. Unsafe abortion may be induced by the woman herself or by an abortion provider and it may involve ingestion of harmful substances; the exertion of external force; insertion of a solid object (root, twig or catheter) into the uterus; or misuse of modern pharmaceutical (World Health Organisation, 2007)

Half of all maternal deaths globally are caused by haemorrhage, sepsis due to childbirth and unsafe abortion. Unsafe abortion-related deaths are due to severe infections or bleeding caused by the procedure, or due to organ damage. It can result in many short and long-term consequences including infertility (WHO, 2014). The global case fatality rate associated with unsafe abortion is 220 per 100,000, whilst the case fatality rate for Sub-Sahara Africa is 460 per

100,000 (WHO, 2014). In a study by Bankole et al., (2015) they observed that in some of the hospitals, unsafe abortion is one of the leading causes of all maternal mortality in the country and is responsible for up to 15% of maternal deaths. It also shows that the case fatality rate ranges between 1.0% and 1.5%, which means that one woman will die, for every 100 illegal abortions performed. The global estimate is three times lower than this figure (World Health Organisation, 2014).

Other studies by Grimes et al., (2006) and Guttmacher Institute (2007) shows unsafe abortion increases the chances of ectopic pregnancy, premature labour and recurrent spontaneous abortion in the subsequent pregnancies. They also state that women who had pelvic abscess and adhesions due to complicated unsafe abortion have a fivefold increase chance of an ectopic pregnancy as a result of the post-abortive infection due to an illegal abortion.

Similarly, in Ghana, a study was done by Schwandt et al., (2010), wherein patients with pregnancy termination complications between June and July 2008 were studied and analysed using multinomial logistic regression. They found that the complications from induced abortion are the second leading cause of maternal mortality, even though the country has one the most liberal abortion laws in sub-Saharan Africa.

According to a cross-sectional study done in Kenya by Paul et al., (2015) using 328 health facilities in five geographical regions. A total of 157,000 women received care from the Kenyan health facilities for both induced and spontaneous complications, and this includes about 120,000 women who were treated for unsafe abortion complications. This implies, that 12 per 1000 women aged 15-49 received health care for unsafe abortion complication in Kenya in 2012.

Also, in another cross-sectional study done in Botswana by Melese et al., (2017) using descriptive statistics and bivariate analysis, the following were found; spontaneous and induced abortion forms 95.5% and 3.9% respectively, whilst clinically detectable anaemia 193 (31.2%) and hypovolaemia and septic shock 65 (10.5%) the leading complications. They reported an association between post-abortion complication with self-individual abortion (P-value 0.018) and delayed uterine evacuation above six hours (P-value 0.035) (Melese et al., 2017).

2.10 Impact of Sexually Transmitted Infections on pregnancy loss.

The term sexually transmitted infection (STIs) refers to any infection contracted primarily through sexual activity or contact. During early gestation, colonization of micro-organism (e.g. Chlamydia trachomatis, Neisseria gonorrhoeae) in the genital tract in pregnant women have been associated with SA, preterm premature rupture of the membrane and perinatal morbidity and mortality. Similarly, pregnancy may increase the risk of Chlamydia trachomatis colonization due to change in the host response. This micro-organism initially infects the cervix and urethra causing vaginal discharge and painful micturition. They later cause Pelvic Inflammatory Diseases such as Cervicitis, Salpingitis and endometritis when they reach the fallopian tube and if they are not treated. The mechanism which the micro-organism trigger abortion is via invasion of choriodecidual space and subsequent immune reaction (Ahmadi et al., 2016). In a study done in Mexico on human papillomavirus (HPV) infection and SA, Conde-Ferrez et al., (2006) observed an association between HPV and pregnancy loss. Amongst cases, 27.3% of HPV positive women reported at least one previous pregnancy loss; compared to 17.43% amongst HPV negative women. Shi et al (2018) conducted a study in China using meta-analysis, involving relevant publications up to 2nd August 2017, to assess, the risk of Herpes Simplex Virus (HSV) and Human Cytomegalovirus infection during pregnancy upon adverse pregnancy

outcomes. They found that, in nine studies, including two cohort studies and seven case-control studies, with a total of 2,905 participants, reported the impact of HSV infection on the risk of SA. Pooled results suggested that HSV infection during pregnancy increased the risk of SA by an OR of 3.81 (95% CI: 1.96–7.41; I2=0.0 %). Sisakht et al., in 2017 conducted a study to assess the presence of Chlamydia trachomatis genome in pregnant women with SA using polymerase chain reaction method. They observed firstly that, there is an association between Chlamydia trachomatis and SA. Also, they noticed that the highest number of isolated cases of Chlamydia trachomatis was revealed in the first abortion (7.47%) and the lowest one in the second (0.93%) and third abortion (0.93%) (Sisakht et al., 2017).

2.11 Impact of maternal health and malformed fetus on pregnancy loss

A study was done in Egypt to show the relationship between maternal health and SA. This study by Saad et al., in 2016 was conducted to assess the relationship between some environmental pollutant and recurrent SA. They observed that the concentration of benzidine was about 13.6 times more in aborters groups than that of corresponding matched control group. Similarly mono, di-acetylated benzidine were found in higher concentration in the aborter group by 10 and 15 fold, respectively, more than observed with control. Also, urinary metabolites of beta-naphthylamine, alpha-naphthylamine were elevated by 3.59-fold and 4.1-fold respectively in the aborter group than the control (Saad et al., 2016). Another study was conducted by Quijada et al., (2011) in General Yague Hospital, Spain on Q fever and SA between June 2009 and July 2010. The findings from a multivariate logistic regression adjusted for SA shows an association between IgG titres compatible with active or recent Q fever and SA (OR 3.4, 95% CI 1.4–8.1) (S.Quijada, B. Teran, 2011).

Alsaif et al., in 2018 conducted a study in Saudi Arabia using systematic review with meta-analysis to assess the consequences of brucellosis infection during pregnancy. They noticed, from the 65 pregnancies complicated by brucellosis infection, 20(31%) resulted in SA (Alsaif, Dabelah, Featherstone, & Robinson, 2018). A retrospective study on the relationship between maternal condition and pregnancy outcome in an outpatient clinic in Greece reported that SA was associated with congenital heart disease (17.8%). (Ntiloudi et al., 2017).

According to Bar et al., (2012) there is association between placental vascular component in early and late intrauterine fetal death. They used a total of 116 patients and the findings from their study shows that, the Intra Uterine Fetal Death (IUFD) group patients (24%) had maternal diseases such as gestational diabetes, hypertensive disorder and thrombophilia. Also these pregnant women tend to have a high parity and high rates of small for gestation fetuses (Bar et al., 2012).

In another study done by Joo et al., (2017), to assess SA in multiple pregnancy: Focus on fetal pathology, shows a relationship between SA and multiple pregnancy. They noticed that out of the 378 (17.6%) perinatal autopsies done for deaths due to miscarriage, there is an increased occurrence of SA among multiple pregnancies (7.3% per live birth) compared to single pregnancy 0.91% per live birth (Joó, Csaba, Szigeti, & Jr, 2012).

CHAPTER THREE

3.0 METHODOLOGY

3.1 Type of Study

This study is a secondary data analysis of the Sierra Leone Demographic and Health Survey (SLDHS) 2013. It is the most recent Demographic Health Survey (DHS) and the second population and health survey that Sierra Leone has conducted. This study gives a summary of the design of the DHS. A well-structured description of the DHS design is found in the DHS report 2013 (Statistics Sierra Leone (SSL) and ICF Macro., 2013) and attached as Appendix A.

3.2 Study Area

Sierra Leone is a small country on the west coast of Africa with a size of about 72,000 kilometer as revealed by the 2015 census. It is bordered by Guinea, Liberia and the Atlantic Ocean and has a population of about 7,092,113. Administratively, it is divided into regions, districts and chiefdoms.

It has four main physical region: the interior lowland, the interior plateau, the coastal plains and the Freetown peninsular raised beaches and hills. The country experienced two main seasons: The wet/raining season, from April/May to October and dry between November and May. Sierra Leone has eight main river systems which the flow is typically from Northeast to Southwest.

Figure 3.2.1 Map of Sierra Leone. Adapted from the Sierra Leone DHS

3.3 DHS Study Design

The DHS is a household-based survey done using a two-stage sample design. It is a well-designed nationally representative sample across the country. The first stage involves selection of sampling units (clusters) through stratification to achieve adequate representation of the urban and rural areas. This was done using the 2004 Population and Housing Census report which has the list of enumeration areas.

The Second stage involves systematically selecting 30 households from each cluster.

The 2013 SLDHS utilizes three questionnaires, namely, a Household Questionnaire, Women‟s Questionnaire, and Men‟s Questionnaire to collect data through interviews. These DHS core questionnaires were developed based on measured DHS program. They are continuously field tested and modified to adapt to the specific situation and the lexicon of Sierra Leone.

All women aged 15-49 and men 15-59 were eligible to be interviewed from each household. Since this study will be focusing on the determinants of abortion responses, the women‟s questionnaire was utilized.

3.4 Women's Questionnaire

The women‟s questionnaire is designed to collect information on five years preceding the survey on respondent‟s background, birth history, family planning history, maternal health, Immunization and health of children under 5, fertility preferences, employment status, knowledge of STIs, female genital cutting, domestic violence and breastfeeding. It is attached as Appendix B. A total number of 16,658 women of reproductive age were captured by the DHS questionnaire used for women.

3.5 Data

The study used data limited to responses from all women who responded to the question of ever had a terminated pregnancy in the past five years preceding the DHS done in 2013 with complete abortion histories.

3.5.1 Inclusion Criteria

All women of reproductive age who responded to the question ever had a terminated pregnancy (self-induced or provider induced) in the five years preceding the DHS 2013 survey.

3.5.2 Exclusion Criteria

Women within reproductive age experiencing infecundability and women with incomplete abortion history. Excluded from this study are 7,123 respondents who did not respond to the question ever had a terminated pregnancy. Based on the set criteria for selection, 9,535 respondents were used for this analysis.

3.6 Variables

The conceptual framework adapted for analysis of determinants of abortion in Sierra Leone guilds the selection of variables to be involved in this analysis of abortion.

3.6.1 Independent Variables

This includes the following:

Socio-demographic factors: age, marital status, occupation/income, residence (urban /rural) educational status and religion

Socio-cultural factors: contraceptive non-use, poor economy, age at first sex, law/ cultural belief, social norms, stigmatization, lack of information, unplanned pregnancy

Sexual factors: sexually transmitted infection, cases of rape, cases of incest

Health factors; fetal abnormality, maternal health.

The following independent variables were mentioned in the conceptual framework setup for this study, however, they were not captured in the Sierra Leone Demography Health Survey: sexually transmitted infection, fetal abnormality, maternal health, poor economy, laws/cultural beliefs and social norms.

3.6.2 Dependent Variable

This is based upon responses to ever had a terminated pregnancy (spontaneous or induced)

3.6.3 Description/Definition of variables

Ever had a terminated pregnancy: refers to the proportion of women of reproductive age who had undergone an abortion in the past. This includes safe and unsafe abortion.

Contraceptive non-use: This is reported non-use of contraceptive methods, or how to access them.

Unmet needs: refers to the proportion of women 15-49 years who are not using any method of contraception but want to stop or delay childbearing. This includes married or in a union.

The variable age was considered as a categorical variable of five-year age groups. Age was also further described using cut-off limits based on previous literature. Education was calculated as a categorical variable with the highest level of education secured (none, Primary, secondary and higher). Marital status was classified as never married, currently married (formally married women and women living in a consensual union with a partner) and formerly married (divorced, widowed and separated). The wealth index was measured orderly as a group of five (poorest, poor, middle, richer, and richest).

Knowledge of family planning was assessed by the DHS as four categories (knows no method, knows only folkloric method, knows only traditional method and knows modern method). Religion was measured as a categorical variable (Christian, Islam, Bahia, traditional and none). Place of residence was grouped as either urban or rural. Exposure to family planning knowledge was assessed by a response to having heard of family planning on the television (TV), radio, newspaper, visited by family planning workers, visit a health facility and staffs talking to respondents at the health facility.

3.6.4 Derived Variables

New variables were generated using gen command then desired variables were replaced/recoded using the replace command. All missing values were dropped and all values ending with 9, 99, 999 and 9999 were also dropped as missing values

Age was categorised into two groups: women under 25 years and above, and the second category of women under 30 years and above.

The contraceptive method used was categorized into groups, as, “user” and “non-users”. Current employment status was classified into two categories, “working” and “not working”. Family planning unmet needs was categorized from the DHS category (unmet need for spacing, unmet need for limiting, using for spacing, using for limiting, spacing failure, limiting failure, no unmet need not married and no sex in last 30 days, infecund and menopausal) into two groups “met” and “unmet” needs.

3.7 Analysis

The data were cleaned to remove missing values. Considering the complex sampling design of the Sierra Leone Demographic Health Surveys, the DHS data was firstly declared, a” survey

data" in order to provide an accurate representation of the population. The sampling weight (v005), primary sampling unit (v021) and sampling strata for sampling errors (v022) were used in the Stata/SE version 14 setup and utilities section to declare the data as a survey data.

The analysis was carried out using the same Stata/SE version 14. Descriptive statistics of background characteristic of respondents were summarised in a table. Also, summary statistics such as mean and standard deviation were computed for continuous variables and proportions for categorical characteristics of the women,

Test of association was carried out using the Pearson‟s correlation coefficient to determine the relationship between variables under study and the outcomes of interest, terminated pregnancy (abortion). Also Fisher‟s exact test was used to determine statistical significance in cases of small sample size. Significance for analysis was set at $p<0.05$.

Logistic regression was used to investigate significant associations between terminated pregnancy (abortion) and identified factors. Simple and multiple models of logistic regression were used to obtain the crude and adjusted odds. Assessment of the strength of these factors as predictors of abortion was done using (OR) and their 95% (CI) for comparisons of their effect on abortion alone and when controlling for other factors.

3.8 Ethical Issues

Approval was sought from the Demographic Health survey office before the commencement of the study.

3.9 Data Limitations

Specific questions which needed answers on abortion especially over the five-year period preceding the survey were not given due diligence.

Non-response, misreporting and recall bias on questions were observed even though the DHS data is a nationally representative data.

4.0 CHAPTER FOUR

RESULTS

4.1 Introduction

This chapter accounts for the findings of respondents who responded to the question ever had a terminated pregnancy from the 2013 SLDHS. The analysis includes 9,535 women of reproductive age (15-49 years) within five years preceding the 2013 SLDHS. It covers the baseline socio-demographic characteristics of all respondents and assesses whether there is any significant association between women who answered the question ever had a terminated pregnancy and those characteristics. The results of this analysis were evaluated and interpreted in relation to the objectives of this study and existing research evidence.

Table 4.1: Social-demographic characteristics of women in the 2013 SLDHS who responded to the question ever had a terminated pregnancy

Socio-demographic		Number of respondents n (%)
Age group	15-19	1671(17.5)
	20-24	1634(17.1)
	25-29	1703(17.9)
	30-34	1439(15.1)
	35-39	1397(14.5)
	40-44	827(9.5)
	45-49	864(9.1)
	Total	9535(100)
Place of Residence	Urban	3461(36.3)
	Rural	6074(63.7)
	Total	**9535(100)**
Educational Status	No education	5731(60.1)
	Primary	1176(12.3)
	Secondary	2388(25.0)

	Higher	240(2.5)
	Total	**9535(100)**
Current Employment status	Not working	1759(18.5)
	Working	7776(81.6)
	Total	**9535(100)**
Wealth Index	Poorest	1806(18.9)
	Poorer	1746(18.3)
	Middle	1855(19.5)
	Richer	2303(24.2)
	Richest	1825(19.1)
	Total	**9535(100)**
Marital Status	Never in union	2104(22.1)
	Married	6528(68.5)
	Living with partner	280(2.9)
	Widowed	270(2.8)
	Divorced	94(1.0)
	Separated	259(2.7)
	Total	**9535(100)**
Region	Eastern	1762(18.5)
	Northern	4049(42.5)
	Southern	2662(27.9)
	Western	1062(11.1)
	Total	**9535(100)**
Religion	Christian	1945(20.4)
	Islam	7555(79.2)
	Bahai	26(0.3)
	Traditional	3(0.0)
	None	6(0.1)
	Total	**9535(100)**
FP information source for user	On Radio	1190(12.5)
	On TV	142(1.5
	News paper	278(2.9
	Visited by FP worker	606(6.4)
	Visited health facility	2250(23.6)
	Staff at the health facility	5069(53.2)
	Total	**9535(100)**
Current family planning use by method type	No method	7727(81.0)
	Folkloric method	64(0.7)
	Traditional method	9(0.1)

	Modern method	1735(18.2)
	Total	**9535(100)**

** FP- Family planning

4.1.1Background characteristics of women who responded to the question ever had a terminated pregnancy

Age: Table 1 shows detail selected socio-demographic characteristics of women who responded to the question ever had a terminated pregnancy. Women who answered the question ever had a terminated pregnancy was observed less among the age group 15-19 years (5.4%) and highest in the age group 35-39years (21%), relatively less among 20-24years (17%) , peaking again at 25-29years (18%) and relatively reduce among women 40-49 years. The combined mean age was 30 ± 9.3.

Educational status: Overall, 67% of the respondents are illiterate and 33% of the women have some form of education. Of the 33% literate women who have some form or have completed education in primary, secondary and tertiary have 17%, 13% and 3% respectively.

Place of residence: Majority of the women who answered the question ever had a terminated pregnancy reside in rural areas (67%), whilst 33% are staying in urban areas.

Marital status: More than two-thirds (69%) of the women reported been married, 22% never in a union and about 3% living with a partner. Respondents reported to be widowed, divorced and separate were about 6%.

Current employment status: 82% of the respondents are employed (i.e. either they are currently working, on leave or had a job in the past year. The remaining women reported they are unemployed.

Religion: The major religious affiliation of respondents is found to be Islam (83%). Respondents who are Christians have a relatively low proportion (16%). The rest of the category represent Bahai, Traditional and None with a very low proportion.

Region: As describe in the table, northern region has the highest proportion (42%) of women who responded to the question ever had a terminated pregnancy, closely followed by the southern region (25%). The western region which housed the capital city has the lowest proportion.

Contraceptive use: The table shows that more than two-thirds (78%) of the respondents do not use any form of contraceptive, whilst nearly 20% of the women use modern methods.

No significant differences were observed with wealth index.

Table 4.2: Social-demographic characteristics comparison of women who have ever had a terminated pregnancy to those who never had in the 2013 SLDHS (N=9535)

Variable		Ever had a terminated pregnancy			Chi2/Fisher	P-value
		Overall (%)	Yes [freq. (%) [#]]	No [freq. (%) [#]]		
Age group	15-19	1671(17.5)	48(5.3)	1623(18.8)	158.9578	< 0.001
	20-24	1634(17.1)	105(11.9)	1529(17.7)		
	25-29	1703(17.9)	173(19.6)	1530(17.7)		
	30-34	1439(15.1)	150(17.0)	1289(14.9)		
	35-39	1397(14.7)	188(21.3)	1209(14.0)		
	40-44	827(8.7)	113(12.8)	714(8.2)		
	45-49	864(9.1)	107(12.1)	757(8.7)		
Place of Residence	Urban	3461(36.3)	296(33.5)	3165(36.6)	3.3360	0.068
	Rural	6074(63.7)	588(66.5)	5486(63.4)		
Educational Status	No education	5731(60.1)	591(66.9)	5140(59.4)	37.3905	< 0.001
	Primary	1176(12.3)	118(13.3)	1058(12.2)		
	Secondary	2388(25.0)	147(16.6)	2241(25.9)		
	Higher	240(2.5)	28(3.2)	212(2.5)		
Wealth Index	Poorest	1806(18.9)	176(19.9)	1630(18.8)	5.3572	0.253

	Poorer	1746(18.3)	173(19.6)	1573(18.1)		
	Middle	1855(19.5)	171(19.3)	1684(19.5)		
	Richer	2303(24.2)	187(21.2)	2116(24.5)		
	Richest	1825(19.1)	177(20.0)	1648(19.1)		
Contraceptive method use	Non-user	7258(76.1)	703(79.5)	6555(75.8)		
	User	2277(23.9)	181(20.5)	2096(24.2)	6.2156	0.013
Current Marital Status	Never married	2384(25.0)	110(12.4)	2274(26.3)		
	Married	6528(68.5)	698(79.0)	5830(67.4)	83.4940	< 0.001
	Formerly married	623(6.53)	76(8.6)	547(6.3)		
Current Employment Status	Not working	1759(18.4)	159(18.0)	1600(18.5)		
	Working	7776(81.6)	725(82.0)	7051(81.5)	0.1379	0.710
Age group at first sex	<=25	3836(40.2)	199(22.5)	3637(42.0)		
	>25	5699(59.8)	685(77.5)	5014(58.0)	127.2242	< 0.001
Knowledge of family planning method	Know no method	479(5.0)	29(3.3)	450(5.2)		
	Know method	9056(95.0)	855(96.7)	8201(94.8)	6.2044	0.013
Region	Eastern	1762(18.5)	190(21.5)	1572(18.2)		
	Northern	4049(42.5)	367(41.5)	3682(42.6)		
	Southern	2662(27.9)	226(25.6)	2436(28.1)	6.9998	0.072
	Western	1062(11.1)	101(11.4)	961(11.1)		
Religion	Christian	1945(20.4)	141(15.9)	1804(20.9)		
	Islam	7555(79.2)	737(83.4)	6818(78.8)		
	Bahai	26(0.3)	4(0.5)	22(0.2)		0.001
	Traditional	3(0.0)	1(0.1)	2(0.0)		
	None	6(0.1)	1(0.1)	5(0.1)		
Current family planning use by method type	No method	7258(76.1)	703(79.5)	6555(75.8)		
	Folkloric method	80(0.8)	4(0.5)	76(0.9)		
	Traditional method	27(0.3)	2(0.2)	25(0.3)		
	Modern method	2170(22.8)	175(19.8)	1995(23.1)	7.0866	0.069
	Total	**9535(100)**	**884(100)**	**8651(100)**		
Mean Age		**30**	**33**	**29**	**t= -11.8742**	**< 0.0001**

** Significant at $P < 0.001$

[#] Column percentages

4.1.2 Bi -Variate analysis

There are many tools to assess the bivariate association between independent and dependent variables and Chi-square (χ^2) is one of them. Chi-square classically measures the statistical significance of cells in a two-way cross-tabulated table with categorical variables. It compares the difference in values in the cells from the expected.

Fisher‟s exact test is also another tool used to assess bivariate association. It is used to calculate the statistical significance for exact values in a contingency tables in cases of small sample size.

There were statistically significant associations between women who ever had a terminated pregnancy and various variables as shown in table 2.

The proportion of age groups in the women who ever had a terminated pregnancy increased from 20-24years (12%), peaked at 35-39years (21%) and the reduced gradually till the age groups 45-49years. On the other hand, the proportion of age groups of women who have not had a terminated pregnancy had its peak at 15-19years (19%) and gradually reduced along age groups till 40-49years. These associations between the age group of respondents and women who ever or never had a terminated pregnancy were significant (χ^2=158.9578, P< 0.001) (Table 2).

Table 2 shows that the majority of respondents in the two groups of women who ever had a terminated pregnancy and those who had not had a terminated pregnancy had no form of education, 67% in the women who ever had a terminated pregnancy and 59% in the women who had not had a terminated pregnancy. The lowest proportion of respondents in both groups (ever had and never had a terminated pregnancy) were seen in those with tertiary education. For respondents who had primary and secondary education, nearly 13% and 17% respectively have ever had a terminated pregnancy and about 12% and 26% had not had a terminated pregnancy.

These associations between the educational status of respondents and ever had or never had a terminated pregnancy were found to be significant (χ^2=37.3905, P<0.001) (Table 2).

The majority (78%) of the respondents who ever had a terminated pregnancy were married whilst only about 12% of those who ever had a terminated pregnancy were either not in a union or are living with their partners. The proportion of married women who had never had a terminated pregnancy were 67%, which was about twice (27%) the number of those who were either not in a union or living with a partner. Formerly married which includes divorced and separated for both groups under comparison were about 9% and 6% respectively. These association between marital status and ever had terminated pregnancy was significant (χ^2= 83.4940, P<0.001) (Table 2).

The majority of respondents had sex above 25 years in both groups under comparison, about 77% in the ever had a terminated pregnancy cohort and 58% in the never had a terminated pregnancy cohort. Those respondents who had sex less than 25 years were nearly 23% in ever had a terminated pregnancy group. The age group in respondents <=25 years start at 8 years. Respondents who had sex less than 25 years in the never had a terminated group were 42%. These association between age group at first sex and ever had a terminated pregnancy were significant (χ^2=127.2242, P<0.001) (Table 2).

More than two-thirds of the respondents in the two groups, ever had a terminated pregnancy and those who never had a terminated pregnancy had Islam as their religious affiliation. 83% of the ever had terminated pregnancy group and nearly 79% in the never had a terminated pregnancy group. The lowest proportion of the respondents who ever had or never had a terminated pregnancy were those who practise traditional and respondents with no religion. Those respondents who were Christians have about 16% and 21% in the ever had or never a terminated

pregnancy group respectively. These associations between religion and the respondents were significant (P=0.001) (table 2).

More than two-thirds of the respondents in both groups were not using a contraceptive method. Nearly 80% of the ever had a terminated pregnancy group and 78% of the never had a terminated pregnancy group. The lowest proportion of respondents using a contraceptive method was about 21% seen in the ever had a terminated pregnancy group. These associations between contraceptive use and ever had a terminated pregnancy were significant (χ^2=6.2156, P=0.013) (Table 2).

A very large proportion of respondents in the two groups had knowledge of family planning method. About 98% in the ever had a terminated pregnancy group and 95% in the never had a terminated group. Respondents who knew no method in were 3% in the ever had a terminated pregnancy group and 5% in the never had a terminated pregnancy group. These association between knowledge of family planning and ever had a terminated pregnancy were significant (χ^2=6.2044, P=0.013) (Table 2).

4.1.3 Two sample t-test (Student's T-Test)

It compares two means and tells how significant the difference are. In essence, it examines whether those differences occurred by chance.

The two sample t-test for age of the groups under comparison, showed that the mean age for women who ever had a terminated pregnancy was 33 ± 8.5 and those for women who never had a terminated pregnancy was 29 ± 9.3. With a given p-value of 0.0001, the difference between the mean ages of the two groups was significant.

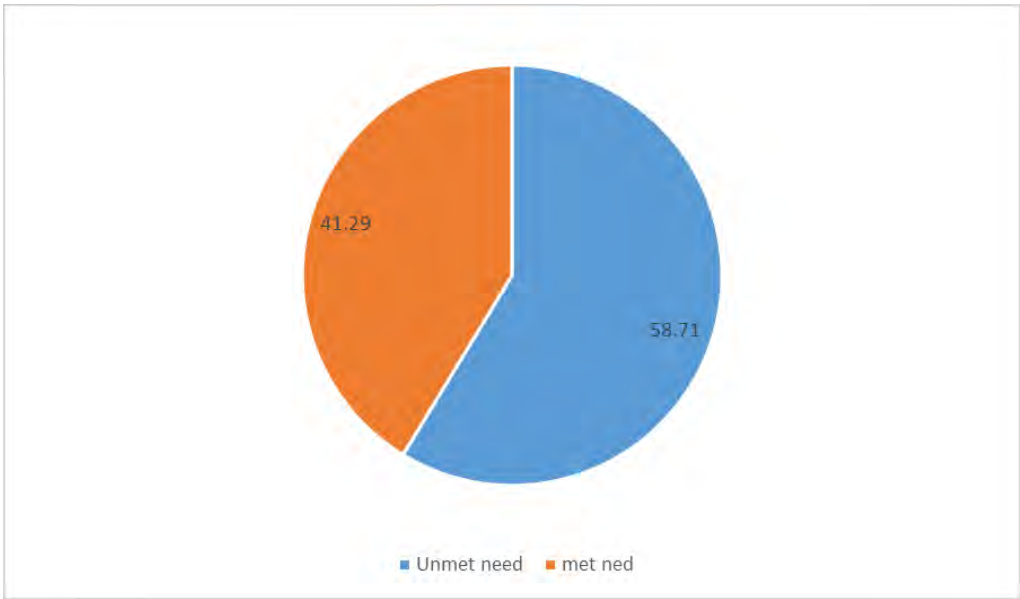

Figure 4.1: Showing the relationship between family planning unmet needs and respondent in the 2013 SLDHS

More than one-third of the respondents in both groups under comparison have an unmet family planning need. Almost 59% in the ever had a terminated pregnancy group and 59% in the never had a terminated pregnancy group. Those respondents with met need are nearly 42% in the ever had a terminated pregnancy cohort and about 41% in the never had a terminated pregnancy.

Table 4.3: Crude and Adjusted Odds Ratio showing association between women who responded to the question ever had a terminated pregnancy in the SLDHS, 2013 and selected variables

Background Characteristic		Crude/Unadjusted odds ratio (95% CI)	P-value	Adjusted odds ratio (95% CI)	P-value
Age group					
	15-19 (Ref)	1		1	
	20-24	2.17 (1.44-3.28)	< 0.001	1.95 (1.27-3.00)	0.003
	25-29	3.48 (2.46-4.93)	< 0.001	3.04 (2.00-4.61)	< 0.001
	30-34	3.53 (2.50-4.97)	< 0.001	3.00 (1.98-4.51)	< 0.001
	35-39	4.20 (2.93-6.01)	< 0.001	3.60 (2.32-5.58)	< 0.001
	40-44	4.74 (3.25-6.91)	< 0.001	4.03 (2.60-6.27)	< 0.001
	45-49	4.56 (3.16-6.57)	< 0.001	3.86 (2.44-6.09)	< 0.001
Place of residence					
	Urban (Ref)	1		1	
	Rural	1.00 (0.75-1.35)	0.086	1.10 (0.78-1.53)	0.564
Educational status					
	No education (Ref)	1		1	
	Primary	0.97 (0.79-1.20)	0.797	1.22 (0.99-1.52)	0.068
	Secondary	0.59 (0.45-0.77)	< 0.001	0.95 (0.66-1.37)	0.783
	Higher	1.21 (0.75-1.96)	0.432	1.27 (0.63-2.54)	0.500
Wealth index					
	Poorest (Ref)	1		1	
	Poorer	1.11 (0.81-1.50)	0.520	1.08 (0.80-1.47)	0.606
	Middle	1.06 (0.78-1.45)	0.688	1.06 (0.78-1.43)	0.725
	Richer	0.95 (0.69-1.31)	0.752	1.02 (0.73-1.43)	0.913
	Richest	1.20 (0.78-1.85)	0.400	1.48 (0.88-2.49)	0.136
Employment status					
	Not working (Ref)	1		1	
	Working	1.03 (0.83-1.27)	0.781	1.10 (0.89-1.36)	0.392
Age in 15 years					
	Age<=30(Ref)	1		1	
	Age>30	0.88 (0.74-1.04)	0.132	0.87 (0.74-1.03)	0.108
FP information source for user					
	On Radio (Ref)	1		1	
	On TV	0.65 (0.29-1.46)	0.296	0.68 (0.30-1.53)	0.352
	News paper	0.65 (0.35-1.21)	0.172	0.63 (0.33-1.20)	0.158
	Visited by FP worker	1.01 (0.69-1.46)	0.969	0.99 (0.67-1.45)	0.953
	Visited health facility	0.89 (0.70-1.25)	0.504	0.89 (0.63-1.27)	0.531
	Staff at the health facility	1.03 (0.72-1.48)	0.855	1.05 (0.73-1.51)	0.794
Marital Status					
	Not married (Ref)	1		1	
	Married	2.06 (1.60-2.65)	< 0.001	1.22 (0.86-1.72)	0.260
	Formerly Married	2.54 (1.67-3.88)	<0.001	1.36 (0.84-2.20)	0.216
Religion					
	Christian (Ref)	1		1	
	Islam	1.27 (0.98-1.64)	0.075	1.26 (0.94-1.67)	0.117
	Bahai	1.24 (0.28-5.42)	0.778	1.35 (0.30-6.16)	0.698
	Traditional	4.40 (0.79-24.65)	0.092	6.44 (1.20-34.60)	0.030
	None	1.87 (0.20017.48)	0.583	2.01 (0.22-18.82)	0.539

* Significant at p <0.001

4.1.3 Multiple logistic regression

This was done to identify the independent variables that can better explain the dependent variable. An unadjusted/crude and adjusted analysis was run using logistic regression to measure the strength of association between the independent variables and ever had a terminated pregnancy.

Unadjusted analysis showed that 24-29years had about a 2.2 times increase whilst, 25-29 and 30-35 have each about a 3.5 times increase in the odds of ever had a terminated pregnancy compared to women in the age group 15-19 years. Women in the age group 35- 39 showed a 4.2 times increase, 40-44years have a 4.7 times increase and 45-49years have about a 4.6 times increase in the odds of ever had a terminated pregnancy compared to women in the age group 15-19 years. The adjusted analysis showed that 20-24 years had about a 2.0 times increase, whilst 25-29 and 30 -34 each had about a 3.0 times increase in the odds of ever had a terminated pregnancy compared to women in the age 15-19 years. Women in the age group 35-39 showed a 3.6 times increase, 40-44 years have a 4.0 times increase and 45-49 years have about 3.9 times increase in the odds of ever had a terminated pregnancy compared to the age group 15-19 years. Unadjusted analysis showed that secondary education had about a 41% decrease in the odds of ever had a terminated pregnancy compared to women who were uneducated. Adjusted analysis did not show any significant degree of association with ever had a terminated pregnancy.

Unadjusted analysis showed that married women had about a 2.1 times increase and formerly married women had a 2.5 times increase in the odds of ever had a terminated pregnancy compared to women who were not married. Adjusted analysis did not show any significant degree of association with ever had a terminated pregnancy.

Unadjusted analysis showed that Islam had about a 1.3 times increase and traditional had a 4.4 times increase in the odds of ever had a terminated pregnancy compared to Christian. Adjusted analysis showed traditional had a 6.4 times increase in the odds of ever had a terminated pregnancy compared to Christian.

In summary, there was a positive and significant association between women of age groups 20-24years, 25-29years, 30-34years, 35-39years, 40-44years and 45-49years and ever had a terminated pregnancy. Also, there was a positive and significant association between women residing in rural areas, married and formal married women and ever had a terminated pregnancy. There was a significant but negative association between secondary education and ever had a terminated pregnancy.

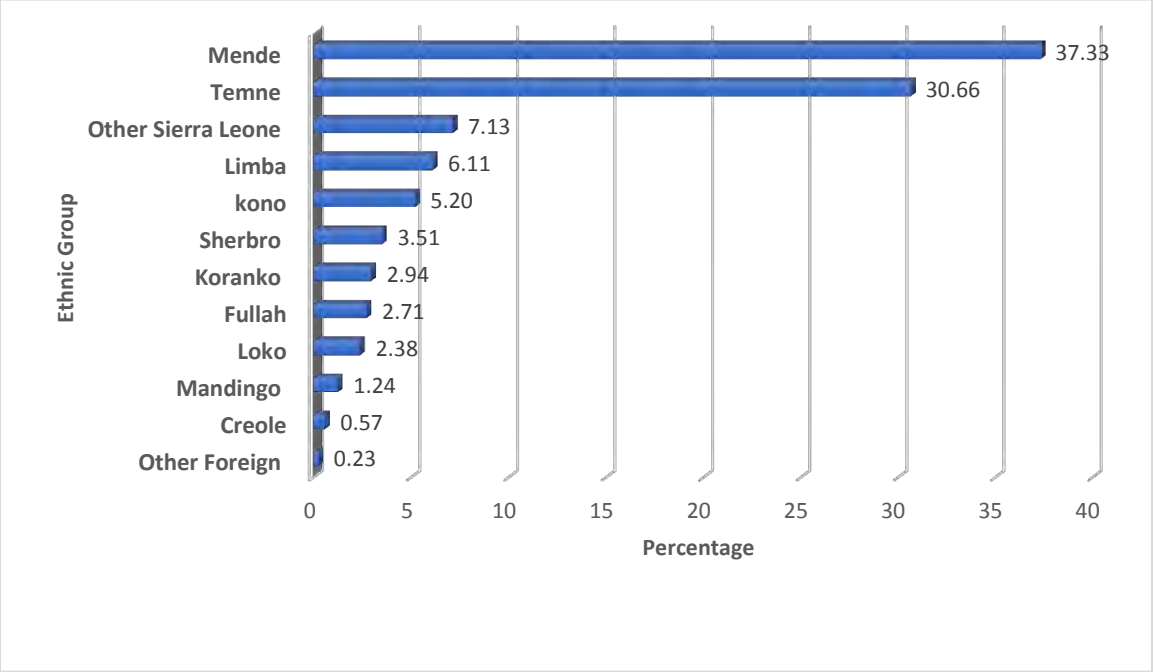

Figure 4.2: Proportion of women who ever had a terminated pregnancy in the 2013 SLDHS based on ethnic groups

Majority of respondents in the survey came from the Mende (37%) and Temne (31%) ethnic groups. Other Sierra Leoneans includes many small ethnic groups which were not mentioned in the survey (i.e. Yaluka, kuroo and Kono). The lowest proportion of the respondents were the foreigners.

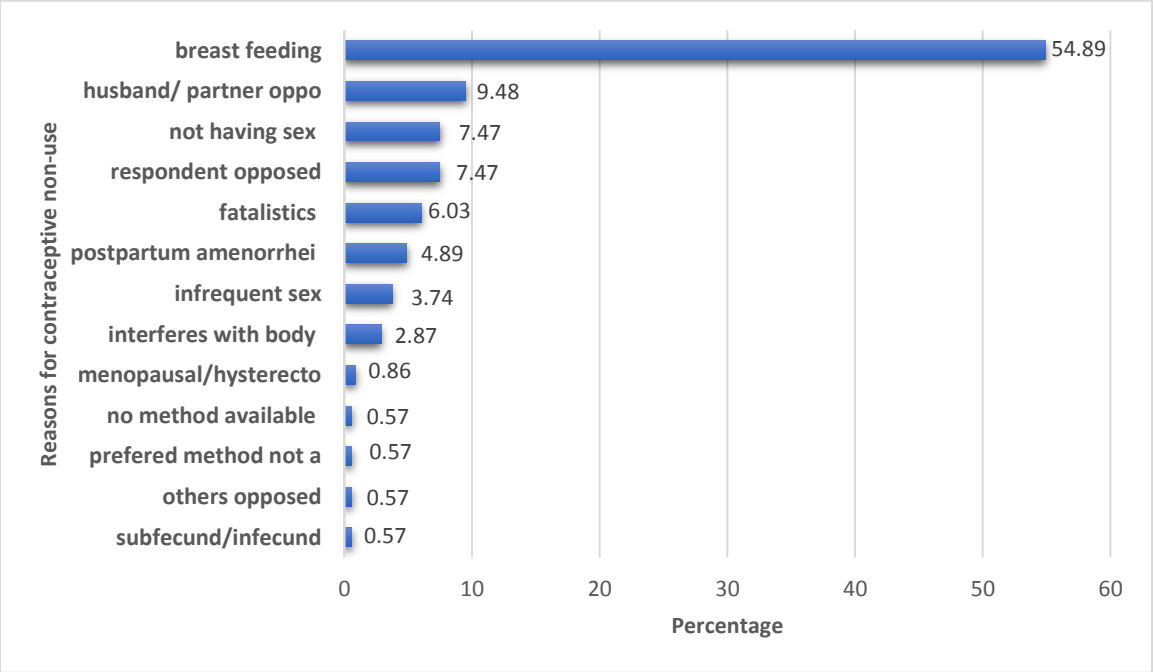

Figure 4.3: Proportion of contraceptive non-users based on the reasons given by women who have ever had a terminated pregnancy in the 2013 SLDHS

Majority of respondents mentioned breastfeeding as a cause for not using contraception. Other respondents gave reasons like husband/ partner opposed (10%), not having sex (8%),

respondents opposed (8%), fatalistic (6%), postpartum amenorrheic (5%) and infrequent sex (4%). The lowest proportion of respondents mentioned the following reasons for not using contraception; no method available, a preferred method not available, others opposed and infecund / subfecund.

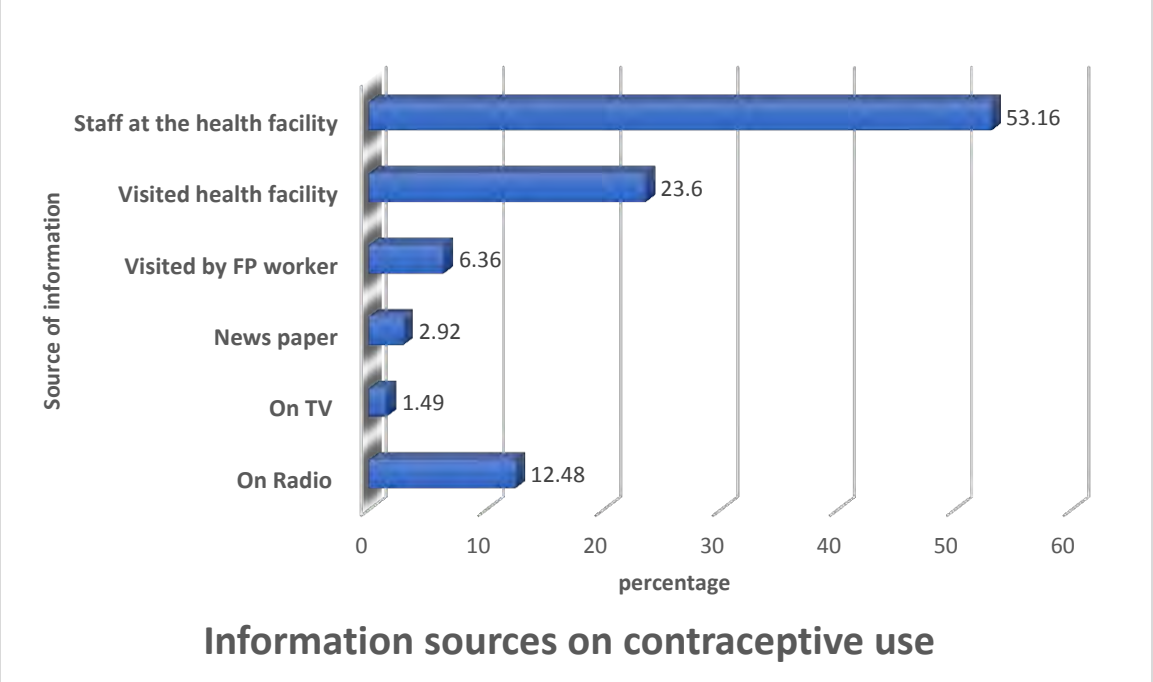

Figure 4.4: The proportion of information sources on contraception given by contraceptive users who ever had a terminated pregnancy in the 2013 SLDHS

More than one-third of the respondents who ever had a terminated pregnancy mentioned that they got to know about contraception due to the information received from a staff at the health facility when they went there for a different purpose, nearly a third of the respondents said they heard about contraception during their visit to health facility for family planning purposes and about 13% of the respondents had of contraception over the radio. The lowest proportion of respondent said that they heard of contraception on television.

CHAPTER FIVE

5.0 DISCUSSIONS

5.1 Summary of Objectives

The aim of the study was to assess the determinants of abortion in Sierra Leone using the 2013 SLDHS. It was also to determine the proportion of women of reproductive age who ever had a terminated pregnancy in the five years preceding the survey. The study aimed to determine if there was a significant association between abortion and some selected background characteristics of women. If one understands the relationship between the certain risk factors and abortion, then preventive strategies can be put in place to minimize the number of abortion cases, especially unsafe abortion. The discussion is done in line with the pattern the results were presented.

5.2 Descriptive statistics of women who ever had or never had a terminated pregnancy

5.2.1 Age

The age gap between respondents was 15-49 years. The age group 25-29 years has the highest frequency 1,703 and the age of 40-44 years has the lowest frequency of 827 women who ever had or never had a terminated pregnancy. Generally, the abortion rate rose from 15-19years, peaked at 25-29 years and reduced among the ages 40-49. The mean age of women is who ever had a terminated pregnancy was 33 ± 8.5 and those for women who never had a terminated pregnancy was 29 ± 9.3. Their overall mean age was 30 ± 9.3. In a study done at Korle-Bu Teaching Hospital by Adanu et al (2005) on the profile of women with abortion complications in Ghana, they reported a combined mean age of 27.6 ±7.8 years, which was slightly lower to the

combined mean of this study. Similarly, a study assessing the factors associated with induced abortion at a selected hospital in the Volta region, Ghana by Klutsey et al., (2014) reported that about 71% of the cases where age 15-24 years, likewise 59% were 24 years and younger in the control group, whilst the remaining respondents were in their late reproductive age. However, they reported an overall mean age of 23.6 ± 4.8 years, with 22.6±5.1 years for cases and 23.8±4.8 years for controls. In a study in Ghana by Mote et al., (2010), where Induced abortion associated factors among Women in Hohoe was studied. They reported that the mean age of respondents was 29.9 years. Also, they stated that the abortion rate rose from 15-24 years, peaked at 25-34 years and reduced at 45-49 years (Mote, Larsen-Reindorf, Otupiri, & Hindin, 2010). Their findings on age were similar to what this study came out with.

5.2.2 Marital status

Twenty-five percent of respondents were not married, whilst about 69% of respondents were married and nearly 7% were formally married (table 2). Not married includes never in a union and living with a partner, married includes currently married and separated and formerly married includes widowed and divorced. A study done by (Schwandt et al., 2010) reported that the proportion of induced abortion cases are higher in single than married, whilst the proportion in spontaneous abortion was higher in married than singles. They argued that though the spontaneous abortion is higher among married women, marital status affect abortion decision in women, therefore, a large proportion of singles will seek an induced abortion. Iloudo et al., (2017) reported 61% of married women in their study had an abortion, compared to 32% of singles and never married. Their findings are in agreement with this study. On the contrary, the findings of this study are in discord with Klutsey et al (2014) who asserted that more than two-

thirds (76%) of abortion cases occurred in single women, whilst 24% was observed among married women.

5.2.3 Education

This study found that education was a significant determinant of abortion (table 2). They observed that 60% of respondents had no form of education, whilst 12% and 13% had primary and secondary education respectively. The least number of respondent had tertiary education, 3%. Ilboudi et al., (2017) on the contrary, reported that 38% of respondents have secondary education, whilst 33% had no education. Similarly, they observed that 65% had primary education, whilst 24% attained university education. In another study conducted by Dahlba et al., (2010) they reported that 39% of respondent had some form of schooling, whilst 61% had no form of schooling. Their finding is also in discord with this study. Interestingly, this trend of disagreement has also been observed by Klutsey et al., (2014) who reported the highest abortion rate among Junior Secondary School/middle school education, whilst respondent with no formal education had the lowest abortion rate.

5.2.4 Employment status

The proportion of unemployed respondents were about 82% whilst employed respondents were about 19%. Studies have shown that a large proportion of unemployed women or house wife‟s experience high abortion rate (Nojomi, Akbarian, & Ashory-Moghadam, 2006). They compared the different age groups in women who had abortion with their employment status and their findings shows the following for unemployed housewife‟s; 15-24years (83%), 25-34% (71%), 35-44% (76%) and +45 (82%), whilst employed/ occupied women had the following; 15-24% (17%), 25-34 (29%), 45-44 (23%) and +45(13%). Their findings are in accordance with this study. Also, Adanu et al., (2005) reported a high incidence of induced (68%) and spontaneous

abortion (77%) among women with low economic activity. In contracts to the findings of this study, (Hosseini &, Amir Erfani, 2017) reported that the employment rate among women who had an abortion was about 5.3%, whilst that for the unemployed was 3.6%.

5.2.5 Religious affiliation

Nearly 79% of the respondents were Muslims, 20% were Christians and about 1% were of the Bahai and traditional religion. This proportion of religious affiliation seen among the respondents is a reflection of Sierra Leone‟s religious composition (Statistics Sierra Leone (SSL) and ICF Macro., 2013). Schwandt et al., (2010) reported 86% of Christians, 10% of Muslims and about 3% for respondent with no religious affiliation. Likewise in a study conducted by Adanu et al., (2005), they reported that majority of respondents (84%) were from the Christian religion and that there was no significant religious difference among the group under comparison. These findings are in discord with the study.

5.2.6 Wealth index

This study did not find a relationship between women who had an abortion and wealth index. However, Schwandt et al., (2010) reported about 50% of respondents who had an abortion were within the low wealth index category, about 26%, medium and about 25% were within the high wealth index category. In another study, Ajei et al., (2015) observed that abortion was 67%-80% higher among women in the top two wealth quintiles than among those of the lowest quintile. They noted that wealthier women tend to have a higher rate of all abortions (induced and spontaneous) (Adjei et al., 2015).

5.2 7 Place of residence

Nearly 64% of respondents reside in rural areas and 36% reside in urban settings. One‟s residential area has a strong association with spontaneous abortion when a univariate analysis is done. Zheng et al., (2017) reported that the likelihood of the association was 2.56 times greater in rural than in urban (COR = 2.56, 95% CI: 2.40–2.72). Likewise, the adjusted odds ratio was found to be significant for rural areas (AOR = 1.68, 95% CI: 1.54–1.84). In disagreement with this study, Klutsey et al., (2014) reported the majority of the respondents were residing in urban areas (about 86% for cases and about 77% for controls), whilst the remaining said they lived in rural areas (15% for cases and 22% for controls)

5.2.8 Knowledge of family planning

About 97% of respondents knew a least one method of contraception and 3% said they don‟t know any method. In a study conducted by Adanu et al., (2005), to assess the profile of women with abortion complications in Ghana, reported a knowledge of contraceptive rate at 79%. Lamina et al., (2015), did a study on abortion and contraceptive practice prevalence in Western Nigeria among women seeking repeated induced abortion and they observed 91.7% contraceptive awareness among women who had had one or more abortions. Their findings are in accordance with this study.

5.2.9 Contraceptive use

Eighteen percent of respondents used a modern method, whilst 81% were not using any method. These findings are similar to what was reported on contraceptive use by Adanu et al., (2005). They disclosed that modern contraceptive use among women who had a terminated pregnancy was very low (31.3 %) (Adanu, Ntumy, & Tweneboah, 2005). In another study by Deckera et al., (2014), where they looked at induced abortion, contraceptive use, and dual protection among

female sex workers in Moscow, Russia, they reported that 9.6% of the respondents were using traditional methods, 17.8% were using withdrawal, whilst a small proportion of respondents (12%) were reported using modern methods. These findings are in agreement with this study.

5.2.10 Age at first sexual intercourse

Almost two-thirds (60%) of the respondents reported they had their first sexual encounter after 25 years and more than one-third (40%) had sex before 25 years. Shu et al., (2016) did a cross-sectional study on the association between unplanned pregnancy and age at first sexual intercourse and knowledge, attitude and practices relating to reproductive health. From their findings, they reported the following proportions of abortion rate for the different age groups under comparison; <15 years (66%), 15-17 years (80%), 18-19 years (78.5%), 20-21 years (75%), 22-25 years (70.6%) and for those above 25 years the rate of abortion was about 82%. This signifies that the rate of abortion increases significantly in those who are 25 years and above (Shu et al., 2016). These findings are in accordance with this study.

5.2.11 Information sources on family planning

About 53% of respondents said they heard about family planning from a staff at the health facility during their visit to health facility for health care services, about 24% said they heard about it during their visit to health facility for different purposes and about 13% said they got the information on family planning on radio. The proportion of respondents who said they heard about family planning visit through health workers, on newspaper and television, were 6%, 3% and 1% respectively. In study a conducted by Khurana et al., (2015) on contraceptive information sources of young adults based on their demographic characteristics and sexual risk behaviours in 2014. They reported that the majority (26%) of respondents said they heard about family planning from doctor/ nurses, p-value at < 0.001. They also reported that respondents who

said they got their information on family planning on television/radio, parents and magazine were 14%, 10% and 9% respectively. This is similar to the findings of this study. In discord to this study, Kozinszy et al., (2004) reported that about 35% of the cases and 50% of the controls heard about family planning through written media whilst about 36% of cases and about 58% of controls heard about it through their partner. Respondents who had it from their family, electronic media and health-care provider were 23%, for cases, 62% for controls, 21% for cases, 61% for controls and 19% for cases, 39% for controls respectively.

CHAPTER SIX

6.0 CONCLUSION AND RECOMMENDATION

6.1 Conclusion

Researchers have long identified the interaction between unsafe abortion and maternal mortality and morbidity. The debates and dialogues to make abortion safe and legal are still ongoing and the challenges are enormous. However, over the years some countries have made progress towards liberalization of the abortion law. Accepting the fact that abortion is an integral part of women rights has only been demonstrated among developed countries.

In Sierra Leone, the abortion laws are yet to be revised, however, under circumstances, safe and legal abortion practices are encouraged.

This thesis was to assess Sierra Leone‟s determinants of abortion using the 2013 Demographic Health Survey. Furthermore, the study was to determine if there was a significant association between contraceptive non-use and induced abortion, also to examine which demographic variables significantly influenced spontaneous and induced abortion. This study was designed to also assess the effect of women‟s socio-economic status on induced abortion.

The following demographic variables significantly influenced abortion; age (χ^2=158.9578, P< 0.001), education (χ^2=37.3905, P<0.001), marital status (χ^2= 83.4940, P<0.001), age group at first sex (χ^2= 127.2242, P<0.001), religion (P=0.001), knowledge of family planning methods (χ^2= 6.2044, P=0.013), and contraceptive use (χ2= 6.2156, P=0.013).

The associations between these were found not to be significant; place of residence (χ^2=3.3360, P=0.068), region (χ^2=6.9998, P=0.072) and types of contraceptive methods used (χ^2=7.0866, P=0.069).

Nearly 80% of contraceptive non-users had a terminated pregnancy, whilst about 20% of those using reported they had a terminate pregnancy.

A significant number of abortion cases were reported among women above 25 years old, married, uneducated, employed, Muslims and those residing outside the capital city (Freetown). However, the socioeconomic status (wealth index) of respondents did not show any significant relationship to abortion, even though evidence from other studies reported some associations.

6.2 Recommendations

After analyzing the findings of the study, these are my recommendations.

Abortion is a very sensitive and stigmatize topic in Sierra Leone and this might create room for underreporting. Continuous dialogue and debates should be organized where women can contribute by openly voicing out their opinions and views on abortion.

The finding of the study takes into consideration the importance of providing information on sexual and reproductive health to address unmet need and to provide services which are friendly to young people. The institution‟s concern should ensure that family planning is prioritized throughout the country and families counsel on children spacing, timing and number of births.

They must ensure there is adequate and appropriate contraceptive methods and provision of regular sexual and reproductive education on safe sexual practices.

Women are the primary victims of abortion, from the consequences of childbirth to giving birth in an environment which is unfriendly. They also sometimes lack the ability to make fertility decision or access abortion services. Provision should be made to empower women to take full responsibility for their reproductive health and access safe abortion services.

The government should support women in accessing sexual and reproductive health services.

REFERENCES

Adanu, R. M. K., Ntumy, M. N., & Tweneboah, E. (2005). Profile of women with abortion complications in Ghana. *Tropical Doctor*, *35*(3), 139–142. https://doi.org/10.1258/0049475054620725

Adjei, G., Enuameh, Y., Asante, K. P., Baiden, F., Nettey, O. E. A., Abubakari, S., … Owusu-agyei, S. (2015). Predictors of abortions in Rural Ghana : a cross-sectional study, 1–7. https://doi.org/10.1186/s12889-015-1572-1

Ahmadi, A., Khodabandehloo, M., Ramazanzadeh, R., Farhadifar, F., Roshani, D., Ghaderi, E., & Farhangi, N. (2016). The relationship between chlamydia trachomatis genital infection and spontaneous abortion. *Journal of Reproduction and Infertility*, *17*(2), 110–116.

Alsaif, M., Dabelah, K., Featherstone, R., & Robinson, J. L. (2018). International Journal of Infectious Diseases Consequences of brucellosis infection during pregnancy : A systematic review of the literature. *International Journal of Infectious Diseases*, *73*, 18–26. https://doi.org/10.1016/j.ijid.2018.05.023

Assaf, S., & Winter, R. (2015). Trends in Maternal Health Indicators in Sierra Leone, 2008-2013, (Report no.97), 2008–2013.

Baba, S., Noda, H., Nakayama, M., Waguri, M., Mitsuda, N., & Iso, H. (2011). Risk factors of early spontaneous abortions among Japanese: a matched case-control study. *Human Reproduction*, *26*(2), 466–472. https://doi.org/http://dx.doi.org/10.1093/humrep/deq343

Bankole, AkinrinolaOye-Adeniran, B. A., Singh, S., & Adewole, I. F. (2006). *Unwanted Pregnancy And Induced Abortion In Nigeria*.

Bar, J., Schreiber, L., Ben-haroush, A., Ahmed, H., Golan, A., & Kovo, M. (2012). The placental vascular component in early and late intrauterine fetal death. *Thrombosis Research*, *130*(6), 901–905. https://doi.org/10.1016/j.thromres.2012.09.013

Berer, M. (2004). Abortion : and Unsafe National Laws The Parameters of Change. *Reproductive Health Matters*, *12*(24), 1–8.

Brookman-Amissah, E., & Moyo, J. B. (2004). Abortion law reform in Sub-Saharan Africa: No

turning back. *Reproductive Health Matters*, *12*(24 SUPPL.), 227–234. https://doi.org/10.1016/S0968-8080(04)24026-5

Center for Reproductive Rights. (2009). The World ‟ s Abortion Laws, 2.

Cohen, S. A. (2009). Facts and Consequences: Legality, Incidence and Safety of Abortion Worldwide. *Guttmacher Policy Review*, *12*(4), 2–6.

Columbia, R. H., Kadzamira, E., & Moleni, C. (2007). THE SAFE SCHOOLS PROGRAM, (December), 1–47.

Conde-Ferráez, L., Chan May, A. D. A., Carrillo-Martínez, J. R., Ayora-Talavera, G., & González-Losa, M. D. R. (2013). Human papillomavirus infection and spontaneous abortion: A case-control study performed in Mexico. *European Journal of Obstetrics Gynecology and Reproductive Biology*, *170*(2), 468–473. https://doi.org/10.1016/j.ejogrb.2013.07.002

Dahlba, E. (2010). Pregnancy loss : spontaneous and induced abortions among young women in Lusaka , Zambia, *12*(3), 247–262. https://doi.org/10.1080/13691050903353383

Fetters, T., Abdella, A., & Kumbi, S. (2008). The Estimated Incidence of Induced Abortion In Ethiopia , 2008, 16–25.

Ghana Statistical Service. (2009). Ghana Demographic and Health Survey Preliminary Report 2008.

Grimes, D. A., Benson, J., Singh, S., Romero, M., Ganatra, B., Okonofua, F. E., & Shah, I. H. (2006). Unsafe abortion: the preventable pandemic. *Lancet*, *368*(9550), 1908–1919. https://doi.org/10.1016/S0140-6736(06)69481-6

Guttmacher Institute. (2007). *Facts on Induced abortion*.

Hornby A. S. (2013). *Oxford Advanced Learner's Dictionary, 8th edition (Oxford Advanced Learner's Dictionary)*. (A. S. Hornby, Ed.) (8th Editio).

Hosseini, H., & , Amir Erfani, M. N. (2017). Factors Associated with Incidence of Induced Abortion in Hamedan, Iran, *20*(5), 282–288.

Ibrahim, I. A., Jeremiah, I., Abasi, I. J., & Addah, A. O. (2011). Pattern of Complicated Unsafe

Abortions in Niger Delta University Teaching Hospital Okolobiri , Nigeria : A 4 Year Review ., *11*(4), 11–15.

Ilboudo, P. G. C., Greco, G., Sundby, J., & Torsvik, G. (2017). Costs and consequences of abortions to women and their households : a cross-sectional study in Ouagadougou , Burkina Faso, (October), 500–507. https://doi.org/10.1093/heapol/czu025

Johnson, B. R., Mishra, V., Lavelanet, A. F., Khosla, R., & Ganatra, B. (2017). A global database of abortion laws, policies, health standards and guidelines. *Bulletin of the World Health Organization*, *95*(7), 542–544. https://doi.org/10.2471/BLT.17.197442

Joó, J. G., Csaba, Á., Szigeti, Z., & Jr, J. R. (2012). Pathology – Research and Practice Spontaneous abortion in multiple pregnancy : Focus on fetal pathology. *Pathology -- Research and Practice*, *208*(8), 458–461. https://doi.org/10.1016/j.prp.2012.05.011

Klutsey, E. E., & Ankomah, A. (2014). Factors associated with induced abortion at selected hospitals in the Volta Region , Ghana, 809–816.

Koster, W. (2010). Social Science & Medicine Linking two opposites of pregnancy loss : Induced abortion and infertility in Yoruba society , Nigeria. *Social Science & Medicine*, *71*(10), 1788–1795. https://doi.org/10.1016/j.socscimed.2010.06.033

Küng, S. A., Saavedra-avendaño, B., Aldaz, E., Consuelo, M., Piñeros, M., Fawcett, G. M., & Darney, B. G. (2018). Capturing compassion : A survey of Mexican Catholics assessing abortion support by reason for abortion and degree of Catholicism ☆. *Contraception*, 6–11. https://doi.org/10.1016/j.contraception.2018.06.008

Lamina, M. A. (2015). Prevalence of abortion and contraceptive practice among women seeking repeat induced abortion in Western Nigeria. *Journal of Pregnancy*, *2015*. https://doi.org/10.1155/2015/486203

Leone, T., Coast, E., Parmar, D., & Vwalika, B. (2016). The individual level cost of pregnancy termination in Zambia: a comparison of safe and unsafe abortion. *Health Policy and Planning*, *31*(7), 825–833. https://doi.org/10.1093/heapol/czv138

Lithur, N. O. (2004). Destigmatising Abortion : Expanding Community Awareness of Abortion as a Reproductive Health Issue in Ghana, *04012*, 1–7.

Lowen, L. (2008). *Ten Arguments For Abortion and Against Abortion Abortion Pros and Cons, and Main Points of the Debat*.

Luiza, A., Borges, V., Olaolorun, F., Fujimori, E., Akiko, L., Hoga, K., & Tsui, A. O. (2015). Contraceptive use following spontaneous and induced abortion and its association with family planning services in primary health care : results from a Brazilian longitudinal study. https://doi.org/10.1186/s12978-015-0087-7

Melese, T., Habte, D., Tsima, B. M., Mogobe, K. D., Chabaesele, K., Rankgoane, G., … Moreri-Ntshabele, B. (2017). High levels of post-abortion complication in a setting where abortion service is not legalized. *PLoS ONE*, *12*(1), 1–13. https://doi.org/10.1371/journal.pone.0166287

Ministry of Health and Sanitation. (2016). *Government of Sierra Leone Ministry of Health and Sanitation*.

Ministry of Health and Sanitation. (2017). *Sierra Leone National Reproductive, Maternal, Newborn, Child & Adolescent Health Policy*.

Mohamed, S. F., Izugbara, C., Moore, A. M., Mutua, M., Kimani-Murage, E. W., Ziraba, A. K., … Egesa, C. (2015). The estimated incidence of induced abortion in Kenya: A cross-sectional study. *BMC Pregnancy and Childbirth*, *15*(1), 1–10. https://doi.org/10.1186/s12884-015-0621-1

Mote, C. V, Larsen-Reindorf, R., Otupiri, E., & Hindin, M. J. (2010). Factors associated with Induced Abortion among Women in Hohoe, Ghana. *African Journal of Reproductive Health*, *14*(4), 110–116. https://doi.org/10.1016/j.biotechadv.2011.08.021.

Nojomi, M., Akbarian, A., & Ashory-Moghadam, S. (2006). Burden of abortion: Induced and spontaneous. *Archives of Iranian Medicine*, *9*(1), 39–45.

Ntiloudi, D., Zegkos, T., Bazmpani, M. A., Parcharidou, D., Panagiotidis, T., Hadjimiltiades, S., … Giannakoulas, G. (2017). ScienceDirect Pregnancy outcome in women with congenital heart disease : A single-center experience. *Hellenic Journal of Cardiology*, 1–5. https://doi.org/10.1016/j.hjc.2017.08.008

Otoide, B. V. O., Oronsaye, F., & Okonofua, F. E. (2001). Why Nigerian Adolescents Seek

Abortion Rather than Contraception : Evidence from Focus-Group Discussions. *International Family Planning Perspectives, 27(2):77–8*(June 2001), 77–81.

Paul, M., Gebreselassie, H., Samai, M., Benson, J., Kargbo, S., & Manibo Lazzarino, M. (2015). Unsafe abortion in Sierra Leone: An examination of costs and burden of treatment on healthcare resources. *Journal of Women's Health Care*, *4*(2), 2. https://doi.org/10.4172/2167-0420.1000228

Pomeroy Claire. (2008). Abortion and Women‟s Rights: Unification of Pro-Life and Pro Choice through Feminism.

Population Reference Bureau. (2006). *Abortion*.

S.Quijada, B. Teran. (2011). Q fever and spontaneous abortion ˜. https://doi.org/10.1111/j.1469-0691.2011.03562.x

Saad, A. A., El-sikaily, A. M. A., El-badawi, E., El-sawaf, G. A., Shaheen, N. E., Omar, M. M., & Zakaria, M. A. (2016). Relation between some environmental pollutants and recurrent spontaneous abortion. *Arabian Journal of Chemistry*, *9*, S787–S794. https://doi.org/10.1016/j.arabjc.2011.08.011

Schwandt, H. M., Creanga, A. A., Danso, K. A., Adanu, R. M. K., Agbenyega, T., & Hindin, M. J. (2010). A comparison of women with induced abortion , spontaneous abortion and ectopic pregnancy in Ghana ☆. *Contraception*, *84*(1), 87–93. https://doi.org/10.1016/j.contraception.2010.10.011

Sedgh, G., Singh, S., Shah, I. H., Hman, E., Henshaw, S. K., & Bankole, A. (2012). Induced abortion: Incidence and trends worldwide from 1995 to 2008. In *The Lancet* (Vol. 379, pp. 625–632). https://doi.org/10.1016/S0140-6736(11)61786-8

Shu, C., Fu, A., Lu, J., Yin, M., Chen, Y., Qin, T., … Yin, P. (2016). Association between age at first sexual intercourse and knowledge , attitudes and practices regarding reproductive health and unplanned pregnancy : a cross-sectional study, *5*, 0–9. https://doi.org/10.1016/j.puhe.2016.01.021

Singh, S., Fetters, T., Gebreselassie, H., Abdella, A., Gebrehiwot, Y., Kumbi, S., & Audam, S. (2010). The estimated incidence of induced abortion in Ethiopia, 2008. *International*

Perspectives on Sexual and Reproductive Health, *36*(1), 16–25. https://doi.org/10.1363/3601610

Singh, S., & Maddow-Zimet, I. (2016). Facility-based treatment for medical complications resulting from unsafe pregnancy termination in the developing world, 2012: a review of evidence from 26 countries. *BJOG: An International Journal of Obstetrics and Gynaecology*, *123*(9), 1489–1498. https://doi.org/10.1111/1471-0528.13552

Singh, S., Prada, E., Mirembe, F., & Kiggundu, C. (2005). The Incidence of Induced Abortion in Uganda. *International Family Planning Perspectives*, *31*(04), 183–191. https://doi.org/10.1363/3118305

Sisakht, A. J., Omidifar, N., Mohamadkhani, N., Karimpoorfard, M., Kargar, M., & Shokripour, M. (2017). Assessing the presence of Chlamydia trachomatis genome in pregnant women with spontaneous abortion using polymerase chain reaction method in Yasuj: First report from Southwest of Iran. *Journal of Education and Health Promotion*, *6*, 45. https://doi.org/10.4103/jehp.jehp_6_17

Sopheab, H., Tuot, S., Chhea, C., & Gorbach, P. (2015). Characteristics , risk behaviors and factors associated with abortion among female entertainment workers in Cambodia, 1–9. https://doi.org/10.1186/s12978-015-0075-y

Statistics Sierra Leone (SSL) and ICF Macro. (2009). *Sierra Leone Demographic and Health Survey 2008*. https://doi.org/10.1080/04597230112331339362

Statistics Sierra Leone (SSL) and ICF Macro. (2013). Sierra Leone. *Jeune Afrique (Paris, France : 1980)*, *36*(1843–1844), 82. https://doi.org/10.4324/9780203403099_Sierra_Leone

Statistics Sierra Leone and ICF International. (2014). *Sierra Leone Demographic and Health Survey 2013: Key Findings*. *Jeune Afrique (Paris, France : 1980)* (Vol. 36). https://doi.org/10.4324/9780203403099_Sierra_Leone

Tom, H. (2010). What does the Bible say about abortion?

UNFPA. (2008). Making Reproductive Rights and Sexual and Reproductive Health: a reality for all. *Revista de Salud Pública (Bogotá, Colombia)*, *14*(1), 15–27.

United Nations. (2014). *Abortion Policies and Reproductive Health around the World*. *Economic & Social Affairs*.

WHO. (2014). WHO | Unsafe abortion: global and regional estimates of the incidence of unsafe abortion and associated mortality in 2008. *Who*, *5th editio*, 1–67. https://doi.org/10.1017/CBO9781107415324.004

WHO, UNICEF, UNFPA, World_Bank_Group, & UNPD. (2015). Trends in maternal mortality: 1990 to 2015. Executive Summary, 14. https://doi.org/10

World Health Organisation. (2002). Understanding and addressing violence against women Sexual violence.

World Health Organisation. (2007). Unsafe Abortion : Global and regional estimatess of the incidence of unsafe abortion and associated mortality in 2003. *WHO Library Cataloruing-Publication Data*, *5th editio*, 55. https://doi.org/10.1017/CBO9781107415324.004

World Health Organisation. (2014). *WHO | Unsafe abortion: global and regional estimates of the incidence of unsafe abortion and associated mortality in 2008*. *Who* (Vol. 5th editio). https://doi.org/10.1017/CBO9781107415324.004

Zheng, D., Li, C., Wu, T., & Tang, K. (2017). Factors associated with spontaneous abortion : a cross-sectional study of Chinese populations, 1–10. https://doi.org/10.1186/s12978-017-0297-2

Appendix

Appendix A: Sample Design

SAMPLE DESIGN — Appendix A

A.1 OBJECTIVES OF THE SURVEY

The 2013 Sierra Leone Demographic and Health Survey (SLDHS) is the second population and health survey that Sierra Leone has conducted. Based on a nationally representative sample of 13,006 households and 16,500 completed interviews of women, the main objectives of the 2013 SLDHS were to provide up-to-date information on fertility and childhood mortality levels; fertility preferences; awareness, approval, and use of family planning methods; maternal and child health; knowledge and attitudes towards HIV/AIDS and other sexually transmitted infections (STI); and prevalence of HIV/AIDS. All women age 15-49 who slept in the selected households the night before the survey were eligible for the survey. The survey results are representative for the country as a whole, for the urban and rural areas separately, for each of the four geographical regions, and for each of the 14 administrative districts.

Apart from the women's survey, a survey among men was conducted in one of every two households selected for the women's survey. All men age 15-59 who slept in the households selected for the men's survey were interviewed with the Man's Questionnaire. All eligible men age 15-59 and all eligible women age 15-49 in the households selected for men's survey were eligible for HIV testing.

A.2 SAMPLING FRAME

Administratively, Sierra Leone is divided into four geographical regions. Each region is subdivided into districts, each district into chiefdoms, and each chiefdom into sections. In total, there are 14 districts, 149 chiefdoms, and 1320 sections. In addition to these administrative units, during the 2004 Sierra Leone Population and Housing Census (SLPHC 2004), each section was subdivided into convenient area units called Enumeration Areas (EAs). An electronic file of a complete list of all EAs is available. The list contains census information on household, population, urban-rural specification, and administrative belongings for every EA. The census EA was used as the primary sampling unit (PSU), also called cluster, for the 2013 SLDHS. The samples of the 2013 SLDHS were selected from the frame of PSUs provided by Statistics Sierra Leone (SSL). The frame excluded the population living in collective housing units, such as hotels, hospitals, work camps, prisons, and the like. Table A.1 below gives the distribution of residential households, by districts and by urban-rural residence. In Sierra Leone, 36 percent of the households are in urban areas, according to the sampling frame.

Table A.1 Distribution of residential households by district and type of residence

District	Residential households			Percentage distribution	
	Urban	Rural	Total	Urban	District
Kailahun	9,353	55,573	64,926	14.4	7.9
Kenema	30,783	57,773	88,556	34.8	10.8
Kono	19,642	39,184	58,826	33.4	7.2
Bombali	15,503	46,408	61,911	25.0	7.6
Kambia	6,793	30,346	37,139	18.3	4.5
Koinadugu	3,714	39,986	43,700	8.5	5.3
Port Loko	10,552	55,038	65,590	16.1	8.0
Tonkolili	9,058	43,803	52,861	17.1	6.4
Bo	28,932	46,868	75,800	38.2	9.2
Bonthe	3,701	21,784	25,485	14.5	3.1
Moyamba	3,857	41,366	45,223	8.5	5.5
Pujehun	3,712	31,927	35,639	10.4	4.3
Western Area Rural	17,617	12,443	30,060	58.6	3.7
Western Area Urban	134,138		134,138	100.0	16.4
Sierra Leone	297,355	522,499	819,854	36.3	100.0

*Sampling frame from the 2004 Population and housing census.

In total, there are 9,671 EAs in Sierra Leone. Table A.2 gives the distribution of EAs and their average size in number of households by district and by urban-rural residence. There are 2,903 EAs located in urban areas and 6,768 EAs located in rural areas. On average, a census EA has 102 households in the urban areas and 77 households in the rural areas, with an overall average of 85 households per EA.

Table A.2 Population EAs and their average size in number of households by district and by type of residence

District	Residential households			Average EA size		
	Urban	Rural	Total	Urban	Rural	Total
Kailahun	86	618	704	109	90	92
Kenema	312	691	1003	99	84	88
Kono	109	496	605	180	79	97
Bombali	166	644	810	93	72	76
Kambia	84	422	506	81	72	73
Koinadugu	41	468	509	91	85	86
Port Loko	124	767	891	85	72	74
Tonkolili	122	703	825	74	62	64
Bo	251	586	837	115	80	91
Bonthe	53	310	363	70	70	70
Moyamba	67	549	616	58	75	73
Pujehun	49	428	477	76	75	75
Western Area Rural	90	86	176	196	145	171
Western Area Urban	1,349		1,349	99		99
Sierra Leone	2,903	6,768	9,671	102	77	85

*Sampling frame from the 2004 Population and housing census.

A.3 Sample Allocation and Sample Selection

The sample for the 2013 SLDHS was a stratified sample selected in two stages from the 2004 census frame. Stratification was achieved by separating each district into urban and rural areas. The West Urban Area has only urban areas. In total, 27 sampling strata had been constructed. Samples had been selected independently in each stratum, by a two-stage selection process. By sorting the sampling frame according to administrative orders and by using a probability proportional to size selection at the first stage's sampling, an implicit stratification and proportional allocation would have been achieved at each of the administrative levels.

The sample allocation took the precision consideration at domain level into account. The DHS surveys in the other countries show that in order to get a reasonable precision for most of the DHS indicators at domain level, at least 800 completed interviews of women age 15-49 are needed for each study domain. This would require at least about 800 households selected for each of the 14 districts. With a decision to interview 30 households per each cluster, Table A.3 below shows the detailed sample allocation clusters and households by district and by residence type.

Table A.3 Sample allocation of EAs and households by district and by type of residence

District	Number of clusters allocated			Number of households allocated		
	Urban	Rural	Total	Urban	Rural	Total
Kailahun	7	25	32	210	750	960
Kenema	15	18	33	450	540	990
Kono	13	18	31	390	540	930
Bombali	11	22	33	330	660	990
Kambia	7	22	29	210	660	870
Koinadugu	4	26	30	120	780	900
Port Loko	8	25	33	240	750	990
Tonkolili	7	24	31	210	720	930
Bo	16	17	33	480	510	990
Bonthe	6	21	27	180	630	810
Moyamba	4	25	29	120	750	870
Pujehun	5	24	29	150	720	870
Western Area Rural	18	10	28	540	300	840
Western Area Urban	37		37	1,110		1,110
Sierra Leon	158	277	435	4,740	8,310	13,050

In the first stage of selection, 435 EAs were selected with probability proportional to size (PPS) with the size of the EA being the number of residential households residing in the EA according to the 2004 population census. Before the main survey, a household listing operation was carried out in all of the selected EAs, and the resulting lists of households served as the sampling frame for the selection of households in the second stage. Some of the selected EAs were large in size. To minimise the task of household listing, the selected EAs with more than 200 households were segmented, and only one segment was selected for the survey with probability proportional to the segment size. Household listing was conducted only in the selected segment. Therefore, a 2013 SLDHS cluster is either an EA or a segment of an EA.

A.4 Selection Probability and Sampling Weight

Due to the non-proportional allocation of the sample to the different districts and to their urban-rural areas, sampling weights are required for any analysis using 2013 SLDHS data to ensure the actual representativeness of the survey results at the national as well as district level. Because the 2013 SLDHS sample was a two-stage stratified cluster sample, sampling weights were calculated based on sampling probabilities separately for each sampling stage and for each cluster. We use the following notations:

P_{1hi}: first-stage sampling probability of the i^{th} cluster in stratum h
P_{2hi}: second-stage sampling probability within the i^{th} cluster (household selection)

Let a_h be the number of clusters selected in stratum h, M_{hi} the number of households according to the sampling frame in the i^{th} cluster, and $\sum M_{hi}$ the total number of households in the stratum. The probability of selecting the i^{th} cluster in the 2013 SLDHS sample is calculated as follows:

$$\frac{a_h M_{hi}}{\sum M_{hi}}$$

Let b_{hi} be the proportion of households in the selected segment compared with the total number of households in the EA and i in stratum h if the EA is segmented; otherwise $b_{hi} = 1$. Then the probability of selecting cluster i in the sample is:

$$P_{1hi} = \frac{a_h M_{hi}}{\sum M_{hi}} \times b_{hi}$$

Let L_{hi} be the number of households listed in the household listing operation in cluster i in stratum h, and let g_{hi} be the number of households selected in the cluster. The second stage's selection probability for each household in the cluster is calculated as follows:

$$P_{2hi} = \frac{g_{hi}}{L_{hi}}$$

The overall selection probability of each household in cluster i of stratum h is therefore the product of the two stages of selection probabilities:

$$P_{hi} = P_{1hi} \times P_{2hi}$$

The design weight for each household in cluster i of stratum h is the inverse of its overall selection probability:

$$W_{hi} = 1 / P_{hi}$$

Next, the design weight is adjusted for household non-response and individual non-response to get the sampling weights for households and for women and men respectively. Non-response is adjusted at the

sampling stratum level. For the household sampling weight, the household design weight is multiplied by the inverse of the household response rate, by stratum. For the women's individual sampling weight, the household sampling weight is multiplied by the inverse of the women's individual response rate, by stratum. For the men's individual sampling weight, the household sampling weight for the male sub-sample is multiplied by the inverse of the men's individual response rate, by stratum. After adjusting for non-response, the sampling weights are normalised to get the final standard weights that appear in the data files. The normalisation process is done to obtain a total number of unweighted cases equal to the total number of weighted cases at the national level, for the total number of households, women, and men separately. Normalisation is done by multiplying the sampling weight by the estimated sampling fraction obtained from the survey for the household weight, the individual woman's weight, and the individual man's weight. The normalised weights are relative weights that are valid for estimating means, proportions, ratios, and rates, but they are not valid for estimating population totals or pooled data. The sampling weights for HIV testing are calculated in a similar way, but the normalisation of the HIV weights is different. The individual HIV testing weights are normalised at the national level for women and men together so that HIV prevalence estimates calculated for women and men together are valid.

A.5 SURVEY RESULTS

Tables A.4 and A.5 present the results of the sample implementation for women and men, respectively. Tables A.6 to A8 show HIV testing coverage among men and women, respectively, according to social, demographic, and sexual behaviour characteristics.

Table A.4 Sample implementation: Women

Percent distribution of households and eligible women by results of the household and individual interviews, and household, eligible women and overall women response rates, according to urban-rural residence and region (unweighted), Sierra Leone 2013

Result	Residence		Region						District													Western Area	Western Area	Total
	Urban	Rural	Eastern	Northern	Southern	Western	Kailahun	Kenema	Kono	Bombali	Kambia	Koinadugu	Port Loko	Tonkolili	Bo	Bonthe	Moyamba	Pujehun	Rural	Urban	
Selected households																								
Completed (C)	96.4	97.5	97.1	97.2	97.4	96.3	96.2	98.2	96.9	95.4	96.5	98.0	97.5	96.9	98.6	94.9	97.4	98.4	97.4	95.5	97.1			
Household present but no competent respondent at home (HP)	0.6	0.3	0.2	0.4	0.2	0.7	0.4	0.0	0.2	0.9	0.3	0.1	0.7	0.1	0.0	0.6	0.2	0.0	0.6	0.8	0.4			
Postponed (P)	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.2	0.1	0.0	0.0	0.0	0.0	0.0			
Refused (R)	0.2	0.0	0.1	0.0	0.0	0.3	0.1	0.0	0.1	0.0	0.0	0.0	0.1	0.0	0.0	0.1	0.0	0.0	0.2	0.4	0.1			
Dwelling not found (DNF)	0.4	0.2	0.2	0.1	0.4	0.5	0.2	0.2	0.1	0.0	0.1	0.2	0.0	0.3	0.0	0.7	0.5	0.3	0.1	0.8	0.3			
Household absent (HA)	1.1	1.3	1.3	1.6	1.0	0.6	1.9	1.0	0.9	3.6	0.5	1.1	0.3	2.3	0.8	1.9	0.5	0.9	0.4	0.8	1.2			
Dwelling vacant/address not a dwelling (DV)	0.8	0.2	0.3	0.4	0.4	0.9	0.0	0.5	0.4	0.0	0.5	0.4	1.0	0.2	0.2	0.5	0.8	0.0	0.6	1.1	0.5			
Dwelling destroyed (DD)	0.3	0.4	0.6	0.1	0.5	0.2	0.7	0.1	1.1	0.0	0.0	0.1	0.2	0.2	0.1	1.2	0.6	0.2	0.5	0.0	0.3			
Other (O)	0.2	0.1	0.2	0.1	0.1	0.5	0.4	0.0	0.3	0.0	0.1	0.0	0.2	0.0	0.0	0.0	0.1	0.1	0.2	0.6	0.2			
Total	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0			
Number of sampled households	4,739	8,267	2,653	4,668	3,534	1,951	950	982	921	999	870	900	987	922	990	894	870	870	840	1,111	13,006			
Household response rate (HRR)[1]	98.8	99.5	99.5	99.4	99.3	98.4	99.2	99.8	99.6	98.1	99.5	99.7	99.2	99.6	99.7	98.5	99.3	99.7	99.0	98.0	99.3			
Eligible women																								
Completed (EWC)	96.8	97.5	97.3	98.5	96.9	95.0	97.5	97.5	97.0	98.7	99.4	98.3	98.9	96.8	98.6	95.2	95.5	97.4	97.3	93.2	97.2			
Not at home (EWNH)	1.8	1.3	1.3	0.9	1.4	3.2	1.4	1.6	0.9	1.0	0.3	0.7	0.8	1.8	0.5	0.8	3.0	1.7	1.8	4.2	1.5			
Postponed (EWP)	0.1	0.0	0.1	0.1	0.0	0.1	0.0	0.1	0.1	0.1	0.1	0.0	0.1	0.1	0.1	0.0	0.0	0.0	0.0	0.1	0.1			
Refused (EWR)	0.7	0.5	0.5	0.2	0.9	0.9	0.1	0.3	1.0	0.1	0.0	0.9	0.0	0.1	0.0	3.4	0.5	0.1	0.2	1.5	0.6			
Partly completed (EWPC)	0.2	0.1	0.2	0.0	0.1	0.3	0.1	0.0	0.5	0.0	0.0	0.0	0.0	0.1	0.2	0.0	0.0	0.0	0.1	0.4	0.1			
Incapacitated (EWI)	0.3	0.4	0.4	0.3	0.5	0.4	0.6	0.3	0.2	0.1	0.2	0.1	0.2	1.0	0.6	0.4	0.5	0.5	0.6	0.2	0.4			
Other (EWO)	0.2	0.2	0.3	0.0	0.2	0.2	0.2	0.3	0.3	0.1	0.1	0.0	0.0	0.1	0.1	0.2	0.5	0.2	0.1	0.2	0.2			
Total	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0			
Number of women	6,996	10,136	3,462	6,329	4,494	2,847	976	1,183	1,303	1,395	1,272	1,119	1,440	1,193	1,539	1,030	1,004	921	1,249	1,604	17,132			
Eligible women response rate (EWRR)[2]	96.8	97.5	97.3	98.5	96.9	95.0	97.5	97.5	97.0	98.7	99.4	98.3	98.9	96.8	96.6	95.2	95.5	97.4	97.3	93.2	97.2			
Overall women response rate (ORR)[3]	95.7	97.0	96.9	97.8	96.2	93.5	96.8	97.3	96.6	97.8	98.9	98.0	98.1	96.4	96.3	93.8	94.8	97.1	96.3	91.3	96.5			

[1] Using the number of households falling into specific response categories, the household response rate (HRR) is calculated as:

$$\frac{100 * C}{C + HP + P + R + DNF}$$

[2] The eligible women response rate (EWRR) is equivalent to the percentage of interviews completed (EWC)

[3] The overall women response rate (ORR) is calculated as:
ORR = HRR * EWRR/100

Table A.5 Sample implementation: Men

Percent distribution of households and eligible men by results of the household and individual interviews, and household, eligible men and overall men response rates, according to urban-rural residence and region (unweighted), Sierra Leone 2013

Result	Residence		Region							District												Total
	Urban	Rural	Eastern	Northern	Southern	Western	Kailahun	Kenema	Kono	Bombali	Kambia	Koinadugu	Port Loko	Tonkolili	Bo	Bonthe	Moyamba	Pujehun	Western Area Rural	Western Area Urban	
Selected households																					
Completed (C)	96.2	97.8	97.2	97.3	97.5	96.3	96.4	98.2	97.0	96.6	98.4	98.2	96.6	97.2	99.0	94.5	97.7	98.4	96.9	95.9	97.2
Household present but no competent respondent at home (HP)	0.6	0.2	0.1	0.3	0.2	1.0	0.2	0.0	0.2	0.4	0.5	0.0	0.6	0.2	0.0	0.5	0.2	0.0	1.2	0.9	0.4
Postponed (P)	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.2	0.2	0.0	0.0	0.0	0.0	0.0
Refused (R)	0.3	0.0	0.1	0.0	0.1	0.4	0.2	0.0	0.0	0.0	0.0	0.0	0.2	0.0	0.2	0.0	0.0	0.0	0.5	0.4	0.1
Dwelling not found (DNF)	0.2	0.2	0.0	0.1	0.4	0.3	0.0	0.0	0.0	0.0	0.2	0.0	0.0	0.2	0.0	0.7	0.5	0.5	0.2	0.4	0.2
Household absent (HA)	1.3	1.1	1.2	1.5	0.9	0.8	2.1	1.0	0.4	3.0	0.2	1.6	0.4	2.2	0.4	2.2	0.2	0.9	0.2	1.3	1.2
Dwelling vacant/address not a dwelling (DV)	0.8	0.3	0.3	0.6	0.4	0.6	0.0	0.6	0.2	0.0	0.5	0.2	1.8	0.2	0.2	0.5	0.9	0.0	0.2	0.9	0.5
Dwelling destroyed (DD)	0.4	0.3	0.9	0.0	0.5	0.1	0.8	0.2	1.7	0.0	0.0	0.0	0.2	0.0	0.0	1.2	0.5	0.2	0.2	0.0	0.4
Other (O)	0.3	0.1	0.2	0.1	0.0	0.4	0.2	0.0	0.4	0.0	0.2	0.0	0.2	0.0	0.0	0.0	0.0	0.0	0.5	0.4	0.1
Total	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
Number of sampled households	2,369	4,132	1,426	2,333	1,767	975	475	491	460	494	435	450	493	461	495	402	435	435	420	555	6,501
Household response rate (HRR)[1]	98.9	99.5	99.8	99.5	99.3	98.2	99.6	100.0	99.8	99.6	99.3	100.0	99.2	99.6	99.6	98.4	99.3	99.5	98.1	98.3	99.3
Eligible men																					
Completed (EMC)	95.0	97.3	97.0	97.1	97.4	92.5	97.3	96.9	96.9	95.4	98.3	97.6	97.1	97.2	98.1	95.5	98.0	97.8	93.6	91.6	96.4
Not at home (EMNH)	3.2	1.7	1.3	2.2	1.3	5.1	1.0	1.7	1.1	4.1	1.1	1.2	2.1	2.6	0.9	1.1	1.6	1.8	5.3	4.8	2.3
Postponed (EMP)	0.1	0.0	0.0	0.1	0.1	0.1	0.0	0.0	0.0	0.2	0.0	0.0	0.2	0.0	0.0	0.0	0.0	0.3	0.0	0.1	0.1
Refused (EMR)	0.7	0.5	0.6	0.2	0.8	0.7	0.2	0.7	0.8	0.4	0.0	0.4	0.4	0.0	0.5	2.7	0.0	0.3	0.3	1.0	0.5
Partly completed (EMPC)	0.1	0.0	0.1	0.0	0.1	0.2	0.0	0.0	0.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.2	0.0	0.0	0.4	0.1
Incapacitated (EMI)	0.2	0.2	0.5	0.1	0.2	0.1	0.7	0.2	0.8	0.0	0.0	0.4	0.0	0.2	0.3	0.2	0.2	0.0	0.2	0.1	0.2
Other (EMO)	0.7	0.2	0.4	0.2	0.2	1.3	0.7	0.5	0.0	0.0	0.6	0.4	0.2	0.0	0.2	0.4	0.0	0.0	0.3	1.9	0.4
Total	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
Number of men	3,137	4,400	1,513	2,665	1,982	1,357	408	583	522	540	540	499	561	545	645	445	492	400	579	778	7,537
Eligible men response rate (EMRR)[2]	95.0	97.3	97.0	97.1	97.4	92.5	97.3	96.9	96.9	95.4	98.3	97.6	97.1	97.2	98.1	95.5	98.0	97.8	93.6	91.6	96.4
Overall men response rate (ORR)[3]	94.0	96.9	96.8	96.7	96.7	90.8	96.9	96.9	96.7	95.0	97.6	97.6	96.3	96.8	97.7	94.0	97.3	97.3	91.8	90.1	95.7

[1] Using the number of households falling into specific response categories, the household response rate (HRR) is calculated as:

$$\frac{100 * C}{C + HP + P + R + DNF}$$

[2] The eligible men response rate (EMRR) is equivalent to the percentage of interviews completed (EMC)

[3] The overall men response rate (OMRR) is calculated as:

OMRR = HRR * EMRR/100

Table A.6 Coverage of HIV testing by social and demographic characteristics: Women

Percent distribution of interviewed women age 15-49 by HIV testing status, according to social and demographic characteristics (unweighted), Sierra Leone 2013

	Testing status					
Characteristic	DBS Tested[1]	Refused to provide blood	Absent at the time of blood collection	Other/missing[2]	Total	Number
Marital status						
Never married	94.9	3.8	0.4	0.9	100.0	2,323
Ever had sexual intercourse	94.7	4.0	0.3	1.0	100.0	1,611
Never had sexual intercourse	95.4	3.5	0.6	0.6	100.0	712
Married/living together	96.0	2.9	0.3	0.9	100.0	5,393
Divorced or separated	94.2	4.7	0.0	1.0	100.0	295
Widowed	95.4	3.7	0.5	0.5	100.0	217
Type of union						
In polygynous union	96.4	2.4	0.2	1.0	100.0	1,915
In non-polygynous union	95.8	3.1	0.3	0.8	100.0	3,387
Not currently in union	94.9	3.9	0.4	0.8	100.0	2,835
DK/missing	93.4	4.4	0.0	2.2	100.0	91
Ever had sexual intercourse						
Yes	95.6	3.2	0.3	0.9	100.0	7,505
No	95.4	3.5	0.6	0.6	100.0	713
Missing	70.0	20.0	10.0	0.0	100.0	10
Currently pregnant						
Pregnant	98.1	1.7	0.0	0.1	100.0	688
Not pregnant or not sure	95.4	3.4	0.3	0.9	100.0	7,540
Times slept away from home in past 12 months						
None	95.5	3.4	0.3	0.8	100.0	5,033
1-2	95.7	3.0	0.4	0.9	100.0	1,592
3-4	96.1	2.6	0.5	0.8	100.0	871
5+	95.2	3.4	0.0	1.4	100.0	727
Missing	80.0	20.0	0.0	0.0	100.0	5
Time away in past 12 months						
Away for more than 1 month	95.1	3.6	0.2	1.1	100.0	1,321
Away for less than 1 month	96.2	2.5	0.4	0.8	100.0	1,853
No away	95.5	3.4	0.3	0.8	100.0	5,033
Missing	85.7	9.5	0.0	4.8	100.0	21
Ethnic group						
Creole	91.4	7.1	1.4	0.0	100.0	70
Fullah	91.8	7.9	0.0	0.4	100.0	280
Kono	94.4	4.3	0.8	0.5	100.0	391
Limba	93.8	3.1	0.2	2.9	100.0	550
Loko	95.1	1.9	0.0	2.9	100.0	206
Mandingo	96.4	3.2	0.4	0.0	100.0	251
Mende	95.5	3.4	0.3	0.7	100.0	2,755
Sherbro	93.1	6.0	0.5	0.5	100.0	217
Temne	96.9	2.3	0.3	0.5	100.0	2,735
Koranho	97.7	1.3	0.3	0.7	100.0	304
Other Sierra Leone	94.3	3.3	0.5	1.9	100.0	423
Other Foreign	90.9	9.1	0.0	0.0	100.0	33
Missing	92.3	7.7	0.0	0.0	100.0	13
Religion						
Christian	94.8	3.3	0.4	1.5	100.0	1,829
Islam	95.8	3.2	0.3	0.7	100.0	6,352
Other	95.7	4.3	0.0	0.0	100.0	23
None	100.0	0.0	0.0	0.0	100.0	3
Missing	90.5	9.5	0.0	0.0	100.0	21
Total	95.6	3.2	0.3	0.9	100.0	8,228

[1] Includes all Dried Blood Samples (DBS) tested at the lab and for which there is a result, i.e., positive, negative, or indeterminate. Indeterminate means that the sample went through the entire algorithm, but the final result was inconclusive.
[2] Includes: 1) other results of blood collection (e.g., technical problem in the field), 2) lost specimens, 3) non corresponding bar codes, and 4) other lab results such as blood not tested for technical reason, not enough blood to complete the algorithm, etc.

Table A.7 Coverage of HIV testing by social and demographic characteristics: Men

Percent distribution of interviewed men 15-59 by HIV testing status, according to social and demographic characteristics (unweighted), Sierra Leone 2013

Characteristic	Testing status				Total	Number
	DBS Tested[1]	Refused to provide blood	Absent at the time of blood collection	Other/missing[2]		
Marital status						
Never married	92.5	5.9	0.6	1.1	100.0	2,869
Ever had sexual intercourse	93.1	5.6	0.5	0.8	100.0	1,916
Never had sexual intercourse	91.2	6.3	0.7	1.8	100.0	953
Married/living together	93.1	5.6	0.4	0.8	100.0	4,127
Divorced or separated	88.6	7.7	0.9	2.7	100.0	220
Widowed	93.5	4.3	0.0	2.2	100.0	46
Type of union						
In polygynous union	93.8	5.0	0.4	0.8	100.0	923
In non-polygynous union	92.9	5.8	0.4	0.9	100.0	3,204
Not currently in union	92.2	6.0	0.6	1.2	100.0	3,135
Ever had sexual intercourse						
Yes	93.0	5.7	0.4	0.9	100.0	6,300
No	91.2	6.3	0.7	1.8	100.0	950
Missing	91.7	0.0	0.0	8.3	100.0	12
Male circumcision						
Circumcised	92.8	5.7	0.5	1.0	100.0	7,213
Not circumcised	83.9	9.7	0.0	6.5	100.0	31
DK/missing	83.3	11.1	0.0	5.6	100.0	18
Times slept away from home in past 12 months						
None	92.3	6.0	0.4	1.3	100.0	3,497
1-2	93.1	5.7	0.5	0.6	100.0	1,137
3-4	94.3	4.9	0.3	0.5	100.0	1,058
5+	92.4	5.9	0.6	1.0	100.0	1,564
Missing	83.3	0.0	0.0	16.7	100.0	6
Time away in past 12 months						
Away for more than 1 month	94.4	4.7	0.4	0.5	100.0	1,830
Away for less than 1 month	92.1	6.4	0.6	0.9	100.0	1,923
No away	92.3	6.0	0.4	1.3	100.0	3,497
Missing	75.0	8.3	0.0	16.7	100.0	12
Ethnic group						
Creole	88.5	7.7	1.3	2.6	100.0	78
Fullah	87.1	12.2	0.0	0.7	100.0	303
Kono	93.2	5.9	0.3	0.6	100.0	323
Limba	91.2	5.5	0.4	2.9	100.0	452
Loko	94.1	5.3	0.0	0.6	100.0	169
Mandingo	94.1	5.0	0.0	0.9	100.0	222
Mende	93.1	5.4	0.5	0.9	100.0	2,384
Sherbro	88.8	9.5	0.0	1.7	100.0	232
Temne	93.8	4.9	0.6	0.6	100.0	2,449
Koranho	97.6	2.4	0.0	0.0	100.0	246
Other Sierra Leone	89.1	7.8	0.6	2.5	100.0	357
Other Foreign	87.5	12.5	0.0	0.0	100.0	32
Missing	73.3	13.3	0.0	13.3	100.0	15
Religion						
Christian	91.0	7.2	0.3	1.5	100.0	1,494
Islam	93.3	5.4	0.5	0.9	100.0	5,742
Other	85.7	14.3	0.0	0.0	100.0	14
None	75.0	0.0	0.0	25.0	100.0	4
Missing	75.0	12.5	0.0	12.5	100.0	8
Total	92.7	5.8	0.5	1.0	100.0	7,262

[1] Includes all Dried Blood Samples (DBS) tested at the lab and for which there is a result, i.e., positive, negative, or indeterminate. Indeterminate means that the sample went through the entire algorithm, but the final result was inconclusive.
[2] Includes: 1) other results of blood collection (e.g., technical problem in the field), 2) lost specimens, 3) non corresponding bar codes, and 4) other lab results such as blood not tested for technical reason, not enough blood to complete the algorithm, etc.

Table A.8 Coverage of HIV testing by sexual behaviour characteristics: Women

Percent distribution of interviewed women age 15-49 who ever had sexual intercourse by HIV test status, according to sexual behaviour characteristics (unweighted), Sierra Leone 2013

Sexual behaviour characteristic	Testing status				Total	Number
	DBS Tested[1]	Refused to provide blood	Absent at the time of blood collection	Other/missing[2]		
Age at first sexual intercourse						
<16	95.8	3.0	0.2	1.0	100.0	3,368
16-17	96.0	3.0	0.3	0.7	100.0	2,055
18-19	95.1	3.6	0.4	0.9	100.0	950
20+	94.7	4.1	0.0	1.3	100.0	393
Missing	95.4	3.7	0.4	0.5	100.0	739
Multiple sexual partners and partner concurrency in past 12 months						
0	96.5	2.4	0.2	1.0	100.0	1,137
1	95.4	3.3	0.3	0.9	100.0	5,889
2+	96.5	3.3	0.0	0.2	100.0	457
Had concurrent partners[3]	95.2	4.4	0.0	0.3	100.0	294
None of the partners were concurrent	98.8	1.2	0.0	0.0	100.0	163
Missing	90.9	4.5	0.0	4.5	100.0	22
Condom use at last sexual intercourse in past 12 months						
Used condom	90.8	6.1	0.0	3.1	100.0	196
Did not use condom	95.6	3.3	0.3	0.8	100.0	6,137
No sexual intercourse in last 12 months	96.4	2.4	0.2	1.0	100.0	1,159
DK/missing	100.0	0.0	0.0	0.0	100.0	13
Number of lifetime partners						
1	93.9	4.3	0.3	1.4	100.0	2,394
2	95.8	2.8	0.3	1.1	100.0	2,213
3-4	97.0	2.5	0.2	0.3	100.0	2,031
5-9	97.1	2.5	0.5	0.0	100.0	647
10+	96.7	1.6	0.0	1.6	100.0	61
Missing	95.6	3.8	0.0	0.6	100.0	159
Prior HIV testing						
Ever tested	95.8	3.0	0.4	0.8	100.0	4,101
Received results	95.7	3.1	0.4	0.8	100.0	3,165
Did not received results	96.0	2.9	0.3	0.7	100.0	936
Never tested	95.5	3.4	0.1	1.0	100.0	3,342
Missing	91.9	4.8	0.0	3.2	100.0	62
Total	95.6	3.2	0.3	0.9	100.0	7,505

[1] Includes all Dried Blood Samples (DBS) tested at the lab and for which there is a result, i.e., positive, negative, or indeterminate. Indeterminate means that the sample went through the entire algorithm, but the final result was inconclusive.
[2] Includes: 1) other results of blood collection (e.g., technical problem in the field), 2) lost specimens, 3) non corresponding bar codes, and 4) other lab results such as blood not tested for technical reason, not enough blood to complete the algorithm, etc.
[3] A respondent is considered to have had concurrent partners if he or she had overlapping sexual partnerships with two or more people during the 12 months before the survey

Table A.9 Coverage of HIV testing by sexual behaviour characteristics: Men

Percent distribution of interviewed men age 15-59 who ever had sexual intercourse by HIV test status, according to sexual behaviour characteristics (unweighted), Sierra Leone 2013

Sexual behaviour characteristic	Testing status				Total	Number
	DBS Tested[1]	Refused to provide blood	Absent at the time of blood collection	Other/missing[2]		
Age at first sexual intercourse						
<16	93.1	5.2	0.6	1.1	100.0	1,567
16-17	93.6	5.4	0.3	0.6	100.0	1,731
18-19	93.3	5.4	0.4	0.8	100.0	1,572
20+	92.2	6.4	0.4	1.1	100.0	1,327
Missing	85.4	13.6	0.0	1.0	100.0	103
Multiple sexual partners and partner concurrency in past 12 months						
0	93.7	5.1	0.2	1.0	100.0	414
1	92.4	6.3	0.4	0.9	100.0	4,017
2+	94.1	4.6	0.6	0.8	100.0	1,866
Had concurrent partners[3]	94.0	4.8	0.5	0.7	100.0	1,221
None of the partners were concurrent	94.3	4.2	0.8	0.8	100.0	645
Missing	66.7	33.3	0.0	0.0	100.0	3
Condom use at last sexual intercourse in past 12 months						
Used condom	90.2	8.5	0.6	0.8	100.0	532
Did not use condom	93.3	5.4	0.4	0.9	100.0	5,333
No sexual intercourse in last 12 months	93.5	5.3	0.2	1.0	100.0	417
DK/missing	72.2	16.7	5.6	5.6	100.0	18
Paid for sexual intercourse in past 12 months						
Yes	90.3	8.9	0.4	0.4	100.0	257
Used condom	91.9	7.3	0.0	0.8	100.0	123
Did not use condom	88.8	10.4	0.7	0.0	100.0	134
No (No paid sexual intercourse/no sexual intercourse in last 12 months)	93.1	5.6	0.4	0.9	100.0	6,043
Number of lifetime partners						
1	90.3	8.0	0.3	1.4	100.0	691
2	94.7	4.6	0.4	0.4	100.0	856
3-4	92.5	5.9	0.6	1.0	100.0	1,449
5-9	94.3	4.8	0.2	0.7	100.0	1,326
10+	94.2	4.6	0.4	0.9	100.0	1,009
Missing	90.9	7.2	0.7	1.1	100.0	969
Prior HIV testing						
Ever tested	92.1	6.6	0.3	1.0	100.0	1,208
Received results	92.3	6.4	0.3	1.0	100.0	994
Did not received results	91.1	7.5	0.5	0.9	100.0	214
Never tested	93.2	5.5	0.5	0.9	100.0	5,091
Missing	100.0	0.0	0.0	0.0	100.0	1
Total	93.0	5.7	0.4	0.9	100.0	6,300

[1] Includes all Dried Blood Samples (DBS) tested at the lab and for which there is a result, i.e., positive, negative, or indeterminate. Indeterminate means that the sample went through the entire algorithm, but the final result was inconclusive.
[2] Includes: 1) other results of blood collection (e.g., technical problem in the field), 2) lost specimens, 3) non corresponding bar codes, and 4) other lab results such as blood not tested for technical reason, not enough blood to complete the algorithm, etc.
[3] A respondent is considered to have had concurrent partners if he or she had overlapping sexual partnerships with two or more people during the 12 months before the survey. (Respondents with concurrent partners includes polygynous men who had overlapping sexual partnerships with two or more wives.)

Appendix B: Women's Questionnaire

01-Jun-13

2013 SIERRA LEONE DEMOGRAPHIC AND HEALTH SURVEY
WOMAN'S QUESTIONNAIRE
STATISTICS SIERRA LEONE

IDENTIFICATION

LOCALITY NAME _____
LOCAL COUNCIL _____
DISTRICT CODE . . . . . .
PROVINCE NAME AND CODE _____
CHIEFDOM CODE . . . . . .
SECTION CODE . . . . . .
DHS CLUSTER NUMBER . . . . . .
ENUMERATION AREA CODE . . . . . .
RURAL (1) / URBAN (2) . . . . . .
HOUSEHOLD NUMBER . . . . . .
NAME OF HOUSEHOLD HEAD _____
WOMAN'S NAME AND LINE NUMBER _____

INTERVIEWER VISITS

	1	2	3	FINAL VISIT
DATE				DAY / MONTH / YEAR (2013)
INTERVIEWER'S NAME				INT. NUMBER
RESULT*				RESULT
NEXT VISIT: DATE				TOTAL NUMBER OF VISITS
TIME				

CHECK COLUMN 12 OF HOUSEHOLD QUESTIONNAIRE

WOMAN WAS SELECTED FOR DOMESTIC VIOLENCE INTERVIEW? YES . . . 1 / NO . . . 0

*RESULT CODES:
1 COMPLETED
2 NOT AT HOME
3 POSTPONED
4 REFUSED
5 PARTLY COMPLETED
6 INCAPACITATED
7 OTHER _____ (SPECIFY)

LANGUAGE OF INTERIVIEW
KRIO . . . 1
TEMNE . . . 2
OTHER . . . 3 _____ (SPECIFY)

SUPERVISOR	FIELD EDITOR	OFFICE EDITOR	KEYED BY
NAME _____	NAME _____		

SECTION 1. RESPONDENT'S BACKGROUND

INTRODUCTION AND CONSENT

INFORMED CONSENT

Hello. My name is _____. I am working with Statistics Sierra Leone. We are conducting a survey about health all over Sierra Leone. The information we collect will help the government to plan health services. Your household was selected for the survey. The questions usually take about 30 to 60 minutes. All of the answers you give will be confidential and will not be shared with anyone other than members of our survey team. You don't have to take part in the survey, but we hope you will agree to answer the questions since your views are important. If I ask you any question you don't want to answer, just let me know and I will go on to the next question or you can stop the interview at any time.

In case you need more information about the survey, you may contact the person listed on the card that has already been given to your household.
Do you have any questions? May I begin the interview now?

SIGNATURE OF INTERVIEWER: _____ DATE: _____

RESPONDENT AGREES TO BE INTERVIEWED . . . 1 ↓ RESPONDENT DOES NOT AGREE TO BE INTERVIEWED . . . 2 → END

NO.	QUESTIONS AND FILTERS	CODING CATEGORIES	SKIP
101	RECORD THE TIME.	HOUR . . . . . ☐☐ MINUTES . . . . . ☐☐	
102	In what month and year were you born?	MONTH . . . . . ☐☐ DON'T KNOW MONTH . . . . . 98 YEAR . . . . . ☐☐☐☐ DON'T KNOW YEAR 9998	
103	How old were you at your last birthday? COMPARE AND CORRECT 102 AND/OR 103 IF INCONSISTENT.	AGE IN COMPLETED YEARS ☐☐	
104	Have you ever attended school?	YES . . . . . 1 NO 2	→ 108
105	What is the highest level of school you attended: primary, secondary, or higher?	PRIMARY . . . . . 1 JUNIOR SECONDARY . . . . . 2 SENIOR SECONDARY . . . . . 3 VOCATIONAL / COMMERCIAL / NURSING TECHNICAL / TEACHING . . . . . 4 HIGHER 5	
106	What is the highest (grade / form / year) you **completed** at that level? IF COMPLETED LESS THAN ONE YEAR AT THAT LEVEL, RECORD '00'.	GRADE / FORM / YEAR . . . . . ☐☐	
107	CHECK 105: PRIMARY ☐ ↓ JUNIOR SECONDARY OR HIGHER ☐		→ 110

NO.	QUESTIONS AND FILTERS	CODING CATEGORIES	SKIP
108	Now I would like you to read this sentence to me. SHOW CARD TO RESPONDENT IF RESPONDENT CANNOT READ WHOLE SENTENCE, PROBE: Can you read any part of the sentence to me?	CANNOT READ AT ALL . . . . . 1 ABLE TO READ ONLY PARTS OF SENTENCE . . . . . 2 ABLE TO READ WHOLE SENTENCE 3 NO CARD WITH REQUIRED LANGUAGE _____ 4 (SPECIFY LANGUAGE) BLIND/VISUALLY IMPAIRED 5	
109	CHECK 108: CODE '2', '3' OR '4' CIRCLED ☐ ↓ CODE '1' OR '5' CIRCLED ☐ → 111		
110	Do you read a newspaper or magazine at least once a week, less than once a week or not at all?	AT LEAST ONCE A WEEK . . . . . 1 LESS THAN ONCE A WEEK . . . . . 2 NOT AT ALL 3	
111	Do you listen to the radio at least once a week, less than once a week or not at all?	AT LEAST ONCE A WEEK . . . . . 1 LESS THAN ONCE A WEEK . . . . . 2 NOT AT ALL 3	
112	Do you watch television at least once a week, less than once a week or not at all?	AT LEAST ONCE A WEEK . . . . . 1 LESS THAN ONCE A WEEK . . . . . 2 NOT AT ALL 3	
113	What is your religion?	CHRISTIAN . . . . . 1 ISLAM . . . . . 2 BAHAI . . . . . 3 TRADITIONAL . . . . . 4 NONE . . . . . 5 OTHER _____ 6 (SPECIFY)	
114	What is your ethnicity?	CREOLE . . . . . 11 FULLAH . . . . . 12 KONO . . . . . 13 LIMBA . . . . . 14 LOKO . . . . . 15 MANDINGO . . . . . 16 MENDE . . . . . 17 SHERBRO . . . . . 18 TEMNE . . . . . 19 OTHER SIERRA LEONE _____ 95 (SPECIFY) OTHER FOREIGN _____ 96 (SPECIFY)	
115	In the last 12 months, how many times have you been away from home for one or more nights? IF NUMBER OF TIMES IS 95 OR MORE, WRITE '95'.	NUMBER OF TIMES . . . . . ☐☐ NONE . . . . . 00 → 201	
116	In the last 12 months, have you been away from home for more than one month at a time?	YES . . . . . 1 NO 2	

NO.	QUESTIONS AND FILTERS	CODING CATEGORIES	SKIP
225	**C** FOR EACH BIRTH SINCE JANUARY 2005 **(1)**, ENTER 'B' IN THE MONTH OF BIRTH IN THE CALENDAR. WRITE THE NAME OF THE CHILD TO THE LEFT OF THE 'B' CODE. FOR EACH BIRTH, ASK THE NUMBER OF MONTHS THE PREGNANCY LASTED AND RECORD 'P' IN EACH OF THE PRECEDING MONTHS ACCORDING TO THE DURATION OF PREGNANCY. (NOTE: THE NUMBER OF 'P's MUST BE ONE LESS THAN THE NUMBER OF MONTHS THAT THE PREGNANCY LASTED.)		
226	Are you pregnant now?	YES . . . . . 1 NO . . . . . 2 UNSURE 8	→ 230
227	How many months pregnant are you? RECORD NUMBER OF COMPLETED MONTHS. **C** ENTER 'P's IN THE CALENDAR, BEGINNING WITH THE MONTH OF INTERVIEW AND FOR THE TOTAL NUMBER OF COMPLETED MONTHS.	MONTHS . . . . . [ ][ ]	
228	When you got pregnant, did you want to get pregnant at that time?	YES . . . . . 1 NO 2	→ 230
229	Did you want to have a baby later on or did you not want any (more) children?	LATER . . . . . 1 NO MORE 2	
230	Have you ever had a pregnancy that miscarried, was aborted, or ended in a stillbirth?	YES . . . . . 1 NO 2	→ 238
231	When did the last such pregnancy end?	MONTH . . . . . [ ][ ] YEAR . . . . . [ ][ ][ ][ ]	
232	CHECK 231: LAST PREGNANCY ENDED IN JAN. 2005 **(1)** OR LATER ↓ LAST PREGNANCY ENDED BEFORE JAN. 2005 **(1)** →		→ 238
233	How many months pregnant were you when the last such pregnancy ended? **C** RECORD NUMBER OF COMPLETED MONTHS. ENTER 'T' IN THE CALENDAR IN THE MONTH THAT THE PREGNANCY TERMINATED AND 'P' FOR THE REMAINING NUMBER OF COMPLETED MONTHS.	MONTHS . . . . . [ ][ ]	
234	Since January 2005 **(1)**, have you had any other pregnancies that did not result in a live birth?	YES . . . . . 1 NO 2	→ 236
235	ASK THE DATE AND THE DURATION OF PREGNANCY FOR EACH EARLIER NON-LIVE BIRTH PREGNANCY BACK TO JANUARY 2005. **(1)** **C** ENTER 'T' IN THE CALENDAR IN THE MONTH THAT EACH PREGNANCY TERMINATED AND 'P' FOR THE REMAINING NUMBER OF COMPLETED MONTHS.		
236	Did you have any miscarriages, abortions or stillbirths that ended before 2005 **(1)**?	YES . . . . . 1 NO 2	→ 238
237	When did the last such pregnancy that terminated before 2005 **(1)** end?	MONTH . . . . . [ ][ ] YEAR . . . . . [ ][ ][ ][ ]	

NO.	QUESTIONS AND FILTERS	CODING CATEGORIES	SKIP
238	When did your last menstrual period start? _____ (DATE, IF GIVEN)	DAYS AGO ..... 1 [ ][ ] WEEKS AGO ..... 2 [ ][ ] MONTHS AGO ..... 3 [ ][ ] YEARS AGO ..... 4 [ ][ ] IN MENOPAUSE/ HAS HAD HYSTERECTOMY ... 994 BEFORE LAST BIRTH ..... 995 NEVER MENSTRUATED 996	
239	From one menstrual period to the next, are there certain days when a woman is more likely to become pregnant?	YES ..... 1 NO ..... 2 DON'T KNOW 8	→ 301
240	Is this time just before her period begins, during her period, right after her period has ended, or halfway between two periods?	JUST BEFORE HER PERIOD BEGINS ..... 1 DURING HER PERIOD ..... 2 RIGHT AFTER HER PERIOD HAS ENDED ..... 3 HALFWAY BETWEEN TWO PERIODS ..... 4 OTHER _____ 6 (SPECIFY) DON'T KNOW 8	

(1) Year of fieldwork is assumed to be 2010. For fieldwork beginning in 2011 or 2012, the year should be 2006 or 2007, respectively.

SECTION 3. CONTRACEPTION

301	Now I would like to talk about family planning - the various ways or methods that a couple can use to delay or avoid a pregnancy. Have you ever heard of (METHOD)? **(1)**		
01	**Female Sterilization**. PROBE: Women can have an operation to avoid having any more children.	YES . . . . . 1 NO 2	
02	**Male Sterilization**. PROBE: Men can have an operation to avoid having any more children.	YES . . . . . 1 NO 2	
03	**IUD**. PROBE: Women can have a loop or coil placed inside them by a doctor or a nurse.	YES . . . . . 1 NO 2	
04	**Injectables**. PROBE: Women can have an injection by a health provider that stops them from becoming pregnant for one or more months.	YES . . . . . 1 NO 2	
05	**Implants**. PROBE: Women can have one or more small rods placed in their upper arm by a doctor or nurse which can prevent pregnancy for one or more years.	YES . . . . . 1 NO 2	
06	**Pill**. PROBE: Women can take a pill every day to avoid becoming pregnant.	YES . . . . . 1 NO 2	
07	**Condom**. PROBE: Men can put a rubber sheath on their penis before sexual intercourse.	YES . . . . . 1 NO 2	
08	**Female Condom**. PROBE: Women can place a sheath in their vagina before sexual intercourse.	YES . . . . . 1 NO 2	
09 **(2)**	**Lactational Amenorrhea Method (LAM)**. **(2)**	YES . . . . . 1 NO 2	
10	**Rhythm Method**. PROBE: To avoid pregnancy, women do not have sexual intercourse on the days of the month they think they can get pregnant.	YES . . . . . 1 NO 2	
11	**Withdrawal**. PROBE: Men can be careful and pull out before climax.	YES . . . . . 1 NO 2	
12	**Emergency Contraception**. PROBE: As an emergency measure, within three days after they have unprotected sexual intercourse, women can take special pills to prevent pregnancy. **(3)**	YES . . . . . 1 NO 2	
13	Have you heard of any other ways or methods that women or men can use to avoid pregnancy?	YES . . . . . 1 _____ (SPECIFY) _____ (SPECIFY) NO 2	
302	CHECK 226: NOT PREGNANT OR UNSURE ☐ ↓ PREGNANT ☐ → 311		
303	Are you currently doing something or using any method to delay or avoid getting pregnant?	YES . . . . . 1 NO 2	→ 311

NO.	QUESTIONS AND FILTERS	CODING CATEGORIES	SKIP
304	Which method are you using? **(4)** CIRCLE ALL MENTIONED. IF MORE THAN ONE METHOD MENTIONED, FOLLOW SKIP INSTRUCTION FOR HIGHEST METHOD IN LIST.	FEMALE STERILIZATION . . . . . A MALE STERILIZATION . . . . . B IUD . . . . . C INJECTABLES . . . . . D IMPLANTS . . . . . E PILL . . . . . F CONDOM . . . . . G FEMALE CONDOM . . . . . H DIAPHRAGM . . . . . I FOAM/JELLY . . . . . J LACTATIONAL AMEN. METHOD . . . . . K RHYTHM METHOD . . . . . L WITHDRAWAL . . . . . M OTHER MODERN METHOD . . . . . X OTHER TRADITIONAL METHOD . . . Y	→ 307 → 308A → 306 → 308A
305	What is the brand name of the pills you are using? IF DON'T KNOW THE BRAND, ASK TO SEE THE PACKAGE.	BRAND A . . . . . 01 BRAND B . . . . . 02 BRAND C . . . . . 03 OTHER _____ 96 (SPECIFY) DON'T KNOW 98	→ 308A
306	What is the brand name of the condoms you are using? IF DON'T KNOW THE BRAND, ASK TO SEE THE PACKAGE.	BRAND A . . . . . 01 BRAND B . . . . . 02 BRAND C . . . . . 03 OTHER _____ 96 (SPECIFY) DON'T KNOW 98	→ 308A
307	In what facility did the sterilization take place? **(5)** PROBE TO IDENTIFY THE TYPE OF SOURCE. IF UNABLE TO DETERMINE IF PUBLIC OR PRIVATE SECTOR, WRITE THE NAME OF THE PLACE. _____ (NAME OF PLACE)	PUBLIC SECTOR GOVT. HOSPITAL . . . . . 11 GOVT. HEALTH CENTER . . . . . 12 FAMILY PLANNING CLINIC . . . . . 13 MOBILE CLINIC . . . . . 14 OTHER PUBLIC SECTOR _____ 16 (SPECIFY) PRIVATE MEDICAL SECTOR PRIVATE HOSPITAL/CLINIC . . . . . 21 PRIVATE DOCTOR'S OFFICE . . . . . 23 MOBILE CLINIC . . . . . 24 OTHER PRIVATE MEDICAL SECTOR _____ 26 (SPECIFY) OTHER _____ 96 (SPECIFY) DON'T KNOW 98	

NO.	QUESTIONS AND FILTERS	CODING CATEGORIES	SKIP
308	In what month and year was the sterilization performed?		
308A	Since what month and year have you been using (CURRENT METHOD) without stopping? PROBE: For how long have you been using (CURRENT METHOD) now without stopping?	MONTH ..... YEAR	
309	CHECK 308/308A, 215 AND 231: ANY BIRTH OR PREGNANCY TERMINATION AFTER MONTH AND YEAR OF START OF USE OF CONTRACEPTION IN 308/308A GO BACK TO 308/308A, PROBE AND RECORD MONTH AND YEAR AT START OF CONTINUOUS USE OF CURRENT METHOD (MUST BE AFTER LAST BIRTH OR PREGNANCY TERMINATION).	YES → NO ↓	
310	CHECK 308/308A: YEAR IS 2005 **(6)** OR LATER → **C** ENTER CODE FOR METHOD USED IN MONTH OF INTERVIEW IN THE CALENDAR AND IN EACH MONTH BACK TO THE DATE STARTED USING. YEAR IS 2004 **(7)** OR EARLIER → **C** ENTER CODE FOR METHOD USED IN MONTH OF INTERVIEW IN THE CALENDAR AND EACH MONTH BACK TO JANUARY 2005 **(6)**. THEN SKIP TO → 322		
311	I would like to ask you some questions about the times you or your partner may have used a method to avoid getting pregnant during the last few years. USE CALENDAR TO PROBE FOR EARLIER PERIODS OF USE AND NONUSE, STARTING WITH MOST RECENT USE, BACK TO JANUARY 2005. **(6)** USE NAMES OF CHILDREN, DATES OF BIRTH, AND PERIODS OF PREGNANCY AS REFERENCE POINTS. **C** **IN COLUMN 1**, ENTER METHOD USE CODE OR '0' FOR NONUSE IN EACH BLANK MONTH. ILLUSTRATIVE QUESTIONS: * When was the last time you used a method? Which method was that? * When did you start using that method? How long after the birth of (NAME)? * How long did you use the method then? **IN COLUMN 2**, ENTER CODES FOR DISCONTINUATION NEXT TO THE LAST MONTH OF USE. NUMBER OF CODES IN COLUMN 2 MUST BE SAME AS NUMBER OF INTERRUPTIONS OF METHOD USE IN COLUMN 1. ASK WHY SHE STOPPED USING THE METHOD. IF A PREGNANCY FOLLOWED, ASK WHETHER SHE BECAME PREGNANT UNINTENTIONALLY WHILE USING THE METHOD OR DELIBERATELY STOPPED TO GET PREGNANT. ILLUSTRATIVE QUESTIONS: * Why did you stop using the (METHOD)? Did you become pregnant while using (METHOD), or did you stop to get pregnant, or did you stop for some other reason? * IF DELIBERATELY STOPPED TO BECOME PREGNANT, ASK: How many months did it take you to get pregnant after you stopped using (METHOD)? AND ENTER '0' IN EACH SUCH MONTH IN COLUMN 1.		

NO.	QUESTIONS AND FILTERS	CODING CATEGORIES	SKIP
312	CHECK THE CALENDAR FOR USE OF ANY CONTRACEPTIVE METHOD IN ANY MONTH NO METHOD USED ☐ ANY METHOD USED ☐		→ 314
313	Have you ever used anything or tried in any way to delay or avoid getting pregnant?	YES . . . 1 NO . . . 2	→ 324
314	CHECK 304: CIRCLE METHOD CODE: IF MORE THAN ONE METHOD CODE CIRCLED IN 304, CIRCLE CODE FOR HIGHEST METHOD IN LIST.	NO CODE CIRCLED . . . 00 FEMALE STERILIZATION . . . 01 MALE STERILIZATION . . . 02 IUD . . . 03 INJECTABLES . . . 04 IMPLANTS . . . 05 PILL . . . 06 CONDOM . . . 07 FEMALE CONDOM . . . 08 DIAPHRAGM . . . 09 FOAM/JELLY . . . 10 LACTATIONAL AMEN. METHOD . . . 11 RHYTHM METHOD . . . 12 WITHDRAWAL . . . 13 OTHER MODERN METHOD . . . 95 OTHER TRADITIONAL METHOD . . . 96	→ 324 → 317A → 326 → 315A → 326
315	You first started using (CURRENT METHOD) in (DATE FROM 308/308A). Where did you get it at that time? **(5)**	PUBLIC SECTOR GOVT. HOSPITAL . . . 11 GOVT. HEALTH CENTER . . . 12 FAMILY PLANNING CLINIC . . . 13 MOBILE CLINIC . . . 14 FIELDWORKER . . . 15 OTHER PUBLIC SECTOR _____ 16 (SPECIFY)	
315A	Where did you learn how to use the rhythm/lactational amenorrhea method? PROBE TO IDENTIFY THE TYPE OF SOURCE. IF UNABLE TO DETERMINE IF PUBLIC OR PRIVATE SECTOR, WRITE THE NAME OF THE PLACE. _____ (NAME OF PLACE)	PRIVATE MEDICAL SECTOR PRIVATE HOSPITAL/CLINIC . . . 21 PHARMACY . . . 22 PRIVATE DOCTOR . . . 23 MOBILE CLINIC . . . 24 FIELDWORKER . . . 25 OTHER PRIVATE MEDICAL SECTOR _____ 26 (SPECIFY) OTHER SOURCE SHOP . . . 31 CHURCH . . . 32 FRIEND/RELATIVE . . . 33 OTHER _____ 96 (SPECIFY)	

NO.	QUESTIONS AND FILTERS	CODING CATEGORIES	SKIP
316	CHECK 304: CIRCLE METHOD CODE: IF MORE THAN ONE METHOD CODE CIRCLED IN 304, CIRCLE CODE FOR HIGHEST METHOD IN LIST.	IUD . . . . . 03 INJECTABLES . . . . . 04 IMPLANTS . . . . . 05 PILL . . . . . 06 CONDOM . . . . . 07 FEMALE CONDOM . . . . . 08 DIAPHRAGM . . . . . 09 FOAM/JELLY . . . . . 10 LACTATIONAL AMEN. METHOD . . . . . 11 RHYTHM METHOD 12	→ 323 → 320 → 326 → 326
317	At that time, were you told about side effects or problems you might have with the method?	YES . . . . . 1 NO 2	→ 319
317A	When you got sterilized, were you told about side effects or problems you might have with the method?		
318	Were you ever told by a health or family planning worker about side effects or problems you might have with the method?	YES . . . . . 1 NO 2	→ 320
319	Were you told what to do if you experienced side effects or problems?	YES . . . . . 1 NO 2	
320	CHECK 317: CODE '1' CIRCLED → At that time, were you told about other methods of family planning that you could use? CODE '1' NOT CIRCLED → When you obtained (CURRENT METHOD FROM 314) from (SOURCE OF METHOD FROM 307 OR 315), were you told about other methods of family planning that you could use?	YES . . . . . 1 NO 2	→ 322
321	Were you ever told by a health or family planning worker about other methods of family planning that you could use?	YES . . . . . 1 NO 2	
322	CHECK 304: CIRCLE METHOD CODE: IF MORE THAN ONE METHOD CODE CIRCLED IN 304, CIRCLE CODE FOR HIGHEST METHOD IN LIST.	FEMALE STERILIZATION . . . . . 01 MALE STERILIZATION . . . . . 02 IUD . . . . . 03 INJECTABLES . . . . . 04 IMPLANTS . . . . . 05 PILL . . . . . 06 CONDOM . . . . . 07 FEMALE CONDOM . . . . . 08 DIAPHRAGM . . . . . 09 FOAM/JELLY . . . . . 10 LACTATIONAL AMEN. METHOD . . . . . 11 RHYTHM METHOD . . . . . 12 WITHDRAWAL . . . . . 13 OTHER MODERN METHOD . . . . . 95 OTHER TRADITIONAL METHOD . . . 96	→ 326 → 326

NO.	QUESTIONS AND FILTERS	CODING CATEGORIES	SKIP
323	Where did you obtain (CURRENT METHOD) the last time? **(5)** PROBE TO IDENTIFY THE TYPE OF SOURCE. IF UNABLE TO DETERMINE IF PUBLIC OR PRIVATE SECTOR, WRITE THE NAME OF THE PLACE. _____ (NAME OF PLACE)	PUBLIC SECTOR GOVT. HOSPITAL . . . . . 11 GOVT. HEALTH CENTER . . . . . 12 FAMILY PLANNING CLINIC . . . . . 13 MOBILE CLINIC . . . . . 14 FIELDWORKER . . . . . 15 OTHER PUBLIC SECTOR _____ 16 (SPECIFY) PRIVATE MEDICAL SECTOR PRIVATE HOSPITAL/CLINIC . . . . . 21 PHARMACY . . . . . 22 PRIVATE DOCTOR . . . . . 23 MOBILE CLINIC . . . . . 24 FIELDWORKER . . . . . 25 OTHER PRIVATE MEDICAL SECTOR _____ 26 (SPECIFY) OTHER SOURCE SHOP . . . . . 31 CHURCH . . . . . 32 FRIEND/RELATIVE . . . . . 33 OTHER _____ 96 (SPECIFY)	→ 326
324	Do you know of a place where you can obtain a method of family planning?	YES . . . . . 1 NO 2	→ 326
325	Where is that? **(5)** Any other place? PROBE TO IDENTIFY EACH TYPE OF SOURCE. IF UNABLE TO DETERMINE IF PUBLIC OR PRIVATE SECTOR, WRITE THE NAME OF THE PLACE. _____ (NAME OF PLACE(S))	PUBLIC SECTOR GOVT. HOSPITAL . . . . . A GOVT. HEALTH CENTER . . . . . B FAMILY PLANNING CLINIC . . . . . C MOBILE CLINIC . . . . . D FIELDWORKER . . . . . E OTHER PUBLIC SECTOR _____ F (SPECIFY) PRIVATE MEDICAL SECTOR PRIVATE HOSPITAL/CLINIC . . . . . G PHARMACY . . . . . H PRIVATE DOCTOR . . . . . I MOBILE CLINIC . . . . . J FIELDWORKER . . . . . K OTHER PRIVATE MEDICAL SECTOR _____ L (SPECIFY) OTHER SOURCE SHOP . . . . . M CHURCH . . . . . N FRIEND/RELATIVE . . . . . O OTHER _____ X (SPECIFY)	

NO.	QUESTIONS AND FILTERS	CODING CATEGORIES	SKIP
326	In the last 12 months, were you visited by a fieldworker who talked to you about family planning? **(8)**	YES . . . . . 1 NO 2	
327	In the last 12 months, have you visited a health facility for care for yourself (or your children)?	YES . . . . . 1 NO 2	→ 401
328	Did any staff member at the health facility speak to you about family planning methods?	YES . . . . . 1 NO 2	

(1) If Standard Days Method is commonly used, it may be added to the table before Lactational Amenorrhea. "**Standard Days Method** (use local term, such as CycleBeads™ , as appropriate) PROBE: A woman uses a string of colored beads to know the days she can get pregnant. On the days she can get pregnant, she uses a condom or does not have sexual intercourse." If Standard Days Method is added to Q. 301, it should also be added before LAM to Qs. 304, 314, 316, 322, and Column 1 of the calendar.

(2) The LAM method should be deleted in countries that do not have a LAM program. In these countries, LAM should also be deleted as a coding category in Qs. 304, 314, 316, 322, and Column 1 of the calendar. A description of LAM should not be provided in Q. 301.

(3) Studies have indicated emergency contraception can be effective up to five days. Verify country program recommendations and modify wording if appropriate.

(4) Other commonly used methods may be added to the list, such as contraceptive patch, contraceptive vaginal ring, or sponge. Any codes added in Q. 304 must also be added to Qs. 314, 316, 322, and Column 1 of the calendar. These methods should not be added to Q. 301.

(5) Coding categories to be developed locally and revised based on the pretest; however, the broad categories must be maintained.

(6) Year of fieldwork is assumed to be 2010. For fieldwork beginning in 2011 or 2012, the year should be 2006 or 2007, respectively.

(7) Year of fieldwork is assumed to be 2010. For fieldwork beginning in 2011 or 2012, the year should be 2005 or 2006, respectively.

(8) In countries without national fieldworker programs that include family planning, Q. 326 should be deleted.

SECTION 6. MARRIAGE AND SEXUAL ACTIVITY

NO.	QUESTIONS AND FILTERS	CODING CATEGORIES	SKIP
601	Are you currently married or living together with a man as if married?	YES, CURRENTLY MARRIED . . . . . 1 YES, LIVING WITH A MAN . . . . . 2 NO, NOT IN UNION 3	→ 604
602	Have you ever been married or lived together with a man as if married?	YES, FORMERLY MARRIED . . . . . 1 YES, LIVED WITH A MAN . . . . . 2 NO 3	→ 612
603	What is your marital status now: are you widowed, divorced, or separated?	WIDOWED . . . . . 1 DIVORCED . . . . . 2 SEPARATED 3	→ 609
604	Is your (husband/partner) living with you now or is he staying elsewhere?	LIVING WITH HER . . . . . 1 STAYING ELSEWHERE 2	
605	RECORD THE HUSBAND'S/PARTNER'S NAME AND LINE NUMBER FROM THE HOUSEHOLD QUESTIONNAIRE. IF HE IS NOT LISTED IN THE HOUSEHOLD, RECORD '00'.	NAME _____ LINE NO.	
606 (1)	Does your (husband/partner) have other wives or does he live with other women as if married?	YES . . . . . 1 NO . . . . . 2 DON'T KNOW 8	→ 609
607 (1)	Including yourself, in total, how many wives or live-in partners does he have?	TOTAL NUMBER OF WIVES AND LIVE-IN PARTNERS . . . . . DON'T KNOW 98	
608 (1)	Are you the first, second, ... wife?	RANK	
609	Have you been married or lived with a man only once or more than once?	ONLY ONCE . . . . . 1 MORE THAN ONCE 2	
610	CHECK 609: MARRIED/ LIVED WITH A MAN ONLY ONCE → In what month and year did you start living with your (husband/partner)? MARRIED/ LIVED WITH A MAN MORE THAN ONCE → Now I would like to ask about your first (husband/partner). In what month and year did you start living with him?	MONTH . . . . . DON'T KNOW MONTH . . . . . 98 YEAR . . . . . DON'T KNOW YEAR 9998	→ 612
611	How old were you when you first started living with him?	AGE	
612	CHECK FOR THE PRESENCE OF OTHERS. BEFORE CONTINUING, MAKE EVERY EFFORT TO ENSURE PRIVACY.		
613	Now I would like to ask some questions about sexual activity in order to gain a better understanding of some important life issues. How old were you when you had sexual intercourse for the very first time?	NEVER HAD SEXUAL INTERCOURSE . . . . . 00 AGE IN YEARS . . . . . FIRST TIME WHEN STARTED LIVING WITH (FIRST) HUSBAND/PARTNER 95	→ 628

NO.	QUESTIONS AND FILTERS	CODING CATEGORIES	SKIP
614	Now I would like to ask you some questions about your recent sexual activity. Let me assure you again that your answers are completely confidential and will not be told to anyone. If we should come to any question that you don't want to answer, just let me know and we will go to the next question.		
615	When was the last time you had sexual intercourse? IF LESS THAN 12 MONTHS, ANSWER MUST BE RECORDED IN DAYS, WEEKS OR MONTHS. IF 12 MONTHS (ONE YEAR) OR MORE, ANSWER MUST BE RECORDED IN YEARS.	DAYS AGO . . . . . 1 [ ][ ] WEEKS AGO . . . . . 2 [ ][ ] MONTHS AGO . . . . . 3 [ ][ ] YEARS AGO . . . . . 4 [ ][ ]	→ 627

		LAST SEXUAL PARTNER	SECOND-TO-LAST SEXUAL PARTNER	THIRD-TO-LAST SEXUAL PARTNER
616	When was the last time you had sexual intercourse with this person?		DAYS AGO 1 WEEKS AGO 2 MONTHS AGO 3	DAYS AGO 1 WEEKS AGO 2 MONTHS AGO 3
617	The last time you had sexual intercourse (with this second/third person), was a condom used? (2)	YES . . . . 1 NO . . . . 2 (SKIP TO 619)	YES . . . . 1 NO . . . . 2 (SKIP TO 619)	YES . . . . 1 NO . . . . 2 (SKIP TO 619)
618	Was a condom used every time you had sexual intercourse with this person in the last 12 months?	YES . . . . 1 NO 2	YES . . . . 1 NO 2	YES . . . . 1 NO 2
619	What was your relationship to this person with whom you had sexual intercourse? IF BOYFRIEND: Were you living together as if married? IF YES, CIRCLE '2'. IF NO, CIRCLE '3'.	HUSBAND . . . . 1 LIVE-IN PARTNER . . . 2 BOYFRIEND NOT LIVING WITH RESPONDENT . . . 3 CASUAL ACQUAINTANCE . . . 4 CLIENT/PROSTITUTE 5 OTHER ________ 6 (SPECIFY) (SKIP TO 622)	HUSBAND . . . . 1 LIVE-IN PARTNER . . . 2 BOYFRIEND NOT LIVING WITH RESPONDENT . . . 3 CASUAL ACQUAINTANCE . . . 4 CLIENT/PROSTITUTE 5 OTHER ________ 6 (SPECIFY) (SKIP TO 622)	HUSBAND . . . . 1 LIVE-IN PARTNER . . . 2 BOYFRIEND NOT LIVING WITH RESPONDENT . . . 3 CASUAL ACQUAINTANCE . . . 4 CLIENT/PROSTITUTE 5 OTHER ________ 6 (SPECIFY) (SKIP TO 622)
620	CHECK 609:	MARRIED ONLY ONCE MARRIED MORE THAN ONCE (SKIP TO 622)	MARRIED ONLY ONCE MARRIED MORE THAN ONCE (SKIP TO 622)	MARRIED ONLY ONCE MARRIED MORE THAN ONCE (SKIP TO 622)
621	CHECK 613:	FIRST TIME WHEN STARTED LIVING WITH FIRST HUSBAND (SKIP TO 623) OTHER	FIRST TIME WHEN STARTED LIVING WITH FIRST HUSBAND (SKIP TO 623) OTHER	FIRST TIME WHEN STARTED LIVING WITH FIRST HUSBAND (SKIP TO 623) OTHER
622	How long ago did you first have sexual intercourse with this (second/third) person?	DAYS AGO 1 WEEKS AGO 2 MONTHS AGO 3 YEARS AGO 4	DAYS AGO 1 WEEKS AGO 2 MONTHS AGO 3 YEARS AGO 4	DAYS AGO 1 WEEKS AGO 2 MONTHS AGO 3 YEARS AGO 4
623	How many times during the last 12 months did you have sexual intercourse with this person? IF NON-NUMERIC ANSWER, PROBE TO GET AN ESTIMATE. IF NUMBER OF TIMES IS 95 OR MORE, WRITE '95'.	NUMBER OF TIMES	NUMBER OF TIMES	NUMBER OF TIMES
624	How old is this person?	AGE OF PARTNER DON'T KNOW 98	AGE OF PARTNER DON'T KNOW 98	AGE OF PARTNER DON'T KNOW 98
625	Apart from (this person/these two people), have you had sexual intercourse with any other person in the last 12 months?	YES . . . . 1 (GO BACK TO 616 IN NEXT COLUMN) NO . . . . 2 (SKIP TO 627)	YES . . . . 1 (GO BACK TO 616 IN NEXT COLUMN) NO . . . . 2 (SKIP TO 627)	
626	In total, with how many different people have you had sexual intercourse in the last 12 months? IF NON-NUMERIC ANSWER, PROBE TO GET AN ESTIMATE. IF NUMBER OF PARTNERS IS 95 OR MORE, WRITE '95'.			NUMBER OF PARTNERS LAST 12 MONTHS . . . DON'T KNOW . . . 98

NO.	QUESTIONS AND FILTERS	CODING CATEGORIES	SKIP
627	In total, with how many different people have you had sexual intercourse in your lifetime? IF NON-NUMERIC ANSWER, PROBE TO GET AN ESTIMATE. IF NUMBER OF PARTNERS IS 95 OR MORE, WRITE '95'.	NUMBER OF PARTNERS IN LIFETIME . . . . . [ ][ ] DON'T KNOW 98	
628	PRESENCE OF OTHERS DURING THIS SECTION	YES NO CHILDREN <10 . . . . . 1 2 MALE ADULTS . . . . . 1 2 FEMALE ADULTS 1 2	
629	Do you know of a place where a person can get condoms?	YES . . . . . 1 NO 2	→ 632
630	Where is that? **(3)** Any other place? PROBE TO IDENTIFY EACH TYPE OF SOURCE. IF UNABLE TO DETERMINE IF PUBLIC OR PRIVATE SECTOR, WRITE THE NAME OF THE PLACE. _____ (NAME OF PLACE(S))	PUBLIC SECTOR GOVERNMENT HOSPITAL . . . . . A GOVT. HEALTH CENTER . . . . . B FAMILY PLANNING CLINIC . . . . . C MOBILE CLINIC . . . . . D FIELDWORKER . . . . . E OTHER PUBLIC SECTOR _____ (SPECIFY) F PRIVATE MEDICAL SECTOR PRIVATE HOSPITAL/CLINIC . . . . . G PHARMACY . . . . . H PRIVATE DOCTOR . . . . . I MOBILE CLINIC . . . . . J FIELDWORKER . . . . . K OTHER PRIVATE MEDICAL SECTOR _____ (SPECIFY) L OTHER SOURCE SHOP . . . . . M CHURCH . . . . . N FRIENDS/RELATIVES . . . . . O OTHER _____ (SPECIFY) X	
631	If you wanted to, could you yourself get a condom?	YES . . . . . 1 NO . . . . . 2 DON'T KNOW/UNSURE 8	
632 **(4)**	Do you know of a place where a person can get female condoms?	YES . . . . . 1 NO 2	→ 701