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CORRELATES OF UNPLANNED PREGNANCY IN ETHIOPIA: BEYOND INDIVIDUAL AND HOUSEHOLD FACTORS

BY

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IN FULFILMENT OF THE REQUIREMENT FOR THE AWARD OF THE DEGREE OF MASTERS IN DEMOGRAPHY AND POPULATION STUDIES

DECLARATION

I, Olajumoke Kiito Olarewaju, declare that this research report is my original work. This research work is being submitted for the degree of Masters in Demography and Population Studies at the University of the Witwatersrand, Johannesburg. To the best of my knowledge, this work has not been submitted for any degree or examination or to any other university.



7th day of August, 2014.

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CHAPTER ONE

1.0 INTRODUCTION

1.1 BACKGROUND

Maternal health is a very important factor in qualifying health care services globally. Globally, approximately 358 000 women die each year during pregnancy, delivery and postpartum phases, with 99% of these death occurring in developing countries (Ononokpono, et al., 2013). Unplanned pregnancy is a pregnancy that has been reported to be unwanted at the time of pregnancy (Habte, et al., 2013). Africa has the highest burden of maternal mortality, with sub-Saharan African countries largely responsible for the dreary figures of maternal deaths with 98% contribution from this region (Babalola & Fatusi, 2009).

Unplanned pregnancy in sub-Saharan Africa is a major problem that has not been easily and quickly solved (Hubacher, et al., 2008). Despite the fact that it has been twenty years since the United Nations International Conference of Population Development in Cairo, the lifetime risk of maternal deaths in sub-Saharan Africa is one in twenty-two mothers compared to one two-hundred and ten in Northern Africa (Babalola & Fatusi, 2009). It has been discovered from literature that unmet need for contraception is more than 30% in most sub-Saharan African countries, with one-quarter of women in their reproductive ages not wanting any more children, while about one-third of these women want to delay pregnancy for about two years before having another child (Hubacher, et al., 2008). The use of contraception has been revealed to prevent unplanned pregnancies, reduce maternal and infant morbidity and mortality; and also accompanied by other significant social and economic benefits (McCoy, et al., 2013). Pregnancy has been identified as an health event posing the greatest health risk among women of

reproductive ages in sub-Saharan Africa (Hubacher, et al., 2008). The rate of unplanned pregnancy is much higher in Eastern Africa with 118 per 1000 women in their reproductive ages experiencing unplanned pregnancy, while other parts of Africa ranges from 56 to 84 per 1000 women in their reproductive ages (Geda & Lako, 2012; Hubacher, et al., 2008).

Ethiopia, in Eastern Africa, is said to have one of the highest number of maternal deaths in the world (Gebreselassie, et al., 2010; Singh, et al., 2010). From the few studies that have been conducted on issues relating to maternal health in Ethiopia, unplanned pregnancy was highlighted among the factors that contribute to maternal mortality in this country (Geda & Lako, 2012). According to the 2011 Ethiopian Demographic and Health Survey, maternal death was 675 deaths per 100 000 live births (Ethiopia Central Statistical Agency & ICF International, 2012), which is relatively high when compared with 300 deaths per 100 000 live births in South Africa, Burkina Faso and Togo (World Health Organization, 2014). Ethiopia has also been described as one of the countries with the lowest utilization of maternal health care services (Wado, et al., 2013). From the Ethiopian Demographic and Health Survey in 2011, 34% of women used antenatal health care services and 10% used the delivery health care services (Wado, et al., 2013). Unsafe abortion in this country has contributed to maternal death. From a qualitative study conducted to assess the knowledge, attitude, behavior and practice of women on abortion in northwest Ethiopia, out of the women aged 15-49 years that was randomly selected, 19% had aborted pregnancy at least once (spontaneous 14% and induced 5%), out of which 71% aborted once and 24% aborted more than once (Senbeto, et al., 2005). This study also found that 74% of women who had aborted were married; and the major reason for induced abortion were the fear of family and the community (Senbeto, et al., 2005). Another study on unsafe abortion in selected health facilities in Ethiopia discovered that 25% of women who participated in the study

had induced abortion, with more than half of the pregnancies aborted been unplanned pregnancies (Mekbib, et al., 2007). Unmet need for contraception among Ethiopian women within the reproductive ages has been a root cause of abortion in this country (Gebreselassie, et al., 2010; Mekbib, et al., 2007; Senbeto, et al., 2005). Despite the fact that abortion has legalized, six in ten abortions in Ethiopia are unsafe (Gebreselassie, et al., 2010; Singh, et al., 2010).

A number of studies have been carried out in Ethiopia on issues relating to unplanned pregnancy, which have basically focused on the causes and factors that influence unplanned pregnancy in some parts of Ethiopia (Teshome, et al., 2014; Wado, et al., 2013; Gebreselassie, et al., 2010; Worku & Fantahun, 2006). These studies identified a number of factors that affected the rate of unplanned pregnancy, these include: age, marital status, contraception, religion, place of residence, number of living and death children, and educational status (Teshome, et al., 2014; Habte, et al., 2013; Wado, et al., 2013; Gebreselassie, et al., 2010). The efforts to reduce the incidence of unplanned pregnancy in Ethiopia have remained weak; therefore there is the need for continued research aimed at reducing unplanned pregnancy. This study will therefore help go beyond individual and household factors to understand the extent to which contextual factors account for variations in unplanned pregnancy in Ethiopia.

1.2 PROBLEM STATEMENT

Unplanned pregnancy is an important indicator of the state of a woman's reproductive health and the degree of autonomy they have in determining their reproductive outcomes (Geda & Lako, 2012). The problem of unplanned pregnancy is one that should not be ignored, due to the adverse psychological trauma and socio-economic turmoil women experience as a result of it (Geda & Lako, 2012). The majority of unplanned pregnancies that occur in sub-Saharan African countries according to studies are due to inaccessibility or avoidance of the use of birth control or family

planning methods (Bankole, et al., 2014; Teshome, et al., 2014; Faye, et al., 2013; Habte, et al., 2013; Geda & Lako, 2012; Hamdela, et al., 2012; Obare, et al., 2012; Hubacher, et al., 2008; Schwarz, et al., 2008; Mbizvo, et al., 1997). It has been estimated that 72% of unplanned pregnancies occurred as a result of inaccessibility or avoidance of birth control practices in sub-Saharan Africa (Hubacher, et al., 2008).

Unplanned pregnancy has been a common factor identified from literature to increase the risk of maternal death (Mbizvo, et al., 1997). Unplanned pregnancy is a major public health problem that predisposes women to behaviors that causes adverse maternal health outcomes; during pregnancy, for example, delayed and inadequate antenatal use, maternal depression and anxiety, smoking and drinking (Wado, et al., 2013).

Each year, there are 75 million unplanned pregnancies among women in less developed countries (an estimated one-third of all their pregnancies) (WHO, 2011). Of the 182 million pregnancies occurring every year, an estimated 36% are unplanned, and 20% end in abortion (WHO, 2011). Unplanned pregnancy has been universally accepted to contribute to poor maternal and poor child health outcomes (morbidity and mortality) (Habte, et al., 2013; Worku & Fantahun, 2006). It predisposes women to the risk of unsafe and illegal abortions in most African countries where abortion is illegal, medical complication and in some cases, death (Habte, et al., 2013; Worku & Fantahun, 2006). In other cases, women who experience unplanned pregnancy might encounter violence, delay the timing of commencement of ante-natal care or experience unsafe delivery (Habte, et al., 2013). The effects of unplanned pregnancy are extensive and they raise a lot of concerns that range from economic to social to psychological and to physical consequences on maternal and child health outcomes (Kuroki, et al., 2008).

Disparities among and within many sub-Saharan African countries have contributed to the differences between the rates of unplanned pregnancy. Women of reproductive ages who are young, poor, have little education or live in the rural areas have been observed to have difficulty in accessing the services they need to have well-planned and healthy pregnancy and also access safe delivery in African countries (Singh et al., 2009).

In Ethiopia, unplanned pregnancy was highlighted to occur majorly among women who do not practice any form of contraception, while others are attributed to failure of traditional methods of contraception (Teshome, et al., 2014). Studies conducted in Ethiopia highlighted that majority of women knew about contraception but only half of these women use any form of contraception (Teshome, et al., 2014; Mekbib, et al., 2007; Senbeto, et al., 2005). Another study conducted in Southern Ethiopia also revealed that the lack of knowledge about contraception, failure of contraceptive methods, and difficulty in getting any of these contraceptive methods were the major factors that contributed to unplanned pregnancy in Ethiopia. Most of the women who experience unplanned pregnancy in Ethiopia resort to induced abortion, which has continued to be unsafe, despite the fact that abortion is legal under some conditions in this country (Teshome, et al., 2014). Ethiopia has experienced high rates of unplanned pregnancy which has remained stable over the years (Habte, et al., 2013); with one-third of births being unplanned (Teshome, et al., 2014). According to the report of the Ethiopia Demographic and Health Survey in 2011, the rate of unplanned pregnancy has remained at 32% over a couple of years (Ethiopia Central Statistical Agency & ICF International, 2012). This has resulted in high rate of maternal and infant morbidity and mortality; and has consequently affected health-care services, social and economic outcomes of women in this country. Studies have shown how individual factors affect unplanned pregnancy in different regions of Ethiopia, but none has looked at Ethiopia as a whole

(that is nationally) and also the contextual variations in unplanned pregnancy (Teshome, et al., 2014; Habte, et al., 2013) (Wado, et al., 2013; Geda & Lako, 2012; Singh, et al., 2010; Worku & Fantahun, 2006). Evidences as to how community-level contextual factors influence variations in unplanned pregnancy is limited, a greater understanding of contextual factors associated with unplanned pregnancy will help inform the development of community-level programs aimed at reducing this phenomenon; which will in turn allow the targeting of these programs to communities in need. Therefore, this study will focus on examining the relationship between individual, household and community factors and unplanned pregnancy in Ethiopia, using Ethiopia Demographic and Health Survey (EDHS), 2011.

1.3 RESEARCH QUESTION

- Is there an association between individual, household and community factors and unplanned pregnancy in Ethiopia?

1.4 RESEARCH OBJECTIVES

1.4.1 General Objective

- To examine the influence of individual, household and community factors on unplanned pregnancy in Ethiopia.

1.4.2 Specific Objectives

1. To examine the levels of unplanned pregnancy and ascertain the factors associated with unplanned pregnancy in Ethiopia.
2. To identify the community factors associated with unplanned pregnancy in Ethiopia.
3. To determine the extent to which contextual factors account for regional variations in unplanned pregnancies in Ethiopia.

1.5 JUSTIFICATION

The need to address the factors contributing to unplanned pregnancy is very important in reducing the number of women exposed to the risks associated with pregnancy, adverse conditions related to child-bearing and maternal deaths. According to estimations from a literature, the advantages of meeting maternal and child health care needs will amount to saving about 750 000 lives every year (Singh et al., 2009). Studies have been conducted on factors contributing to unplanned pregnancy in Ethiopia and differences in some regions in Ethiopia have been highlighted (Habte, et al., 2013; Wado, et al., 2013; Singh, et al., 2010; Worku & Fantahun, 2006). Owing to literatures studied, there has been no multilevel study performed to date that examined the separate and independent contributions of household and community-level factors in the experience of unplanned pregnancy. This study was therefore conducted to fill this research gap and draw attention to the largely unexplored contextual factors that might be associated with unplanned pregnancy. Therefore, this study would widen the understanding of the magnitude of unplanned pregnancy and factors that influence it in Ethiopia, which will help address the safe motherhood initiative which aims to end the needless death associated with childbearing. This study would also help inform the development of intervention programs on how to tackle the issues relating to unplanned pregnancy having in mind the regional variations.

Reducing unplanned births would help reduce spending on education, health and would make social and economic developmental goals easier to achieve. It would also help to improve educational and employment opportunities for women and would then contribute to gender equity, poverty reduction and economic growth (Singh et al., 2009).

Studies on unplanned pregnancy in most developed countries have documented a detailed report of issues regarding unplanned pregnancy. Available literatures on this issue in Ethiopia have not

provided sufficient information especially at the national level, which is very crucial in improving the delivery reproductive health services to women in their reproductive age. The findings of this study would therefore help to guide the policy makers and reproductive health program designers, for example in the Ethiopia Integrated Family Health Program and The International Medical Corps Reproductive Health Program in Ethiopia aimed at reducing maternal mortality from pregnancy-related causes. This study would help understand the contextual factors contributing to unplanned pregnancy in Ethiopia. It would assist in developing, designing and implementing community-based intervention programs, when combined with the available programs, would help reduce unplanned pregnancy, and actions that result in maternal and child morbidity and mortality.

1.6 DEFINITION OF TERMS

1.6.1 Unplanned Pregnancy:

It is a pregnancy that was not wanted at the time conception occurred, irrespective of whether or not contraception was been used (Adhikari, et al., 2009; Barrett & Wellings, 2002).

1.6.2 Maternal health:

Maternal health is the health status of women during pregnancy, childbirth and postpartum period (World Health Organization, 2014).

1.6.3 Household:

These are people who make common provision for food, shelter and other essentials for living (Ethiopia Central Statistical Agency & ICF International, 2012).

1.6.4 Community/contextual characteristics:

They are features of a group of household who share a common geographical location.

1.6.5 Primary sampling unit:

They are distinct administrative areas having population with homogeneous background characteristics (Ethiopia Central Statistical Agency & ICF International, 2012).

1.6.6 Contextual characteristics:

They are the community or contextual-level variables, analyzed at the level of the primary sampling unit (Merlo, et al., 2006).

1.6.7 Variance Partition Coefficient (VPC)/Intra-cluster correlation (ICC):

Variance partition coefficient or intra-cluster correlation is an important measure of relatedness of clustered data within community or household units (Merlo, et al., 2005) . VPC/ICC is calculated as:

$$Vc / (Vc+Vm)$$

Where; Vc is the variance at the macro level and Vm is the variance at the micro level.

1.6.8 Multilevel model:

It is a generalization of linear and generalized linear modeling in which regression coefficients are themselves given a model, whose parameters are also estimated from data (Gelman, 2006).

CHAPTER TWO

2.0 LITERATURE REVIEW

2.1 INTRODUCTION

This chapter provided reviews from relevant literatures and also the theoretical and conceptual frameworks for this study. Literatures on the background of unplanned pregnancy globally, in Africa and Ethiopia were presented. The review of the consequences of unplanned pregnancy on maternal and child health outcomes was also highlighted. The highlighting of relevant literatures helped to establish the need to study the correlates of unplanned pregnancy beyond individual and household levels in Ethiopia.

2.1.1 GLOBAL OVERVIEW OF UNPLANNED PREGNANCY

One of the most important public health problems that raise a lot of concerns globally is unplanned pregnancy (Shokravi & Chapman, 2004; Singh, et al., 2012). Unplanned pregnancy is an impending hazard for all women that are in their reproductive age groups and are sexually active (Adhikari, et al., 2009). Unplanned pregnancy results from a complex set of social and psychological factors, which not only affect women but the cumulative effects are evident on the society at large (Adhikari, et al., 2009). Most women who experience unplanned pregnancy usually want or need to end the pregnancy to avoid the risk on their lives and health and in some other cases to avoid psychological trauma and socioeconomic havoc (Adhikari, et al., 2009). Unplanned pregnancy is an indicator that can be used to measure the state of women's health and the degree of autonomy they have when it pertains to reproductive issues especially the knowledge and use of contraception (Adhikari, et al., 2009).

From studies, more than a hundred million sexual intercourse occur each and every day and around a million conceptions occur as a result of this (Adhikari, et al., 2009; Shokravi & Chapman, 2004); as much as 50% of these pregnancies that results are unplanned (Adhikari, et al., 2009). The authors of these studies further highlighted that desirability of large family size, which remains a distinguishing factor between developed and developing countries. The rates of unplanned pregnancy ranges from 49% in the United States to 46% in Yamagata, Japan to 35% in both Iran and Nepal (Shokravi & Chapman, 2004); while 36% of pregnancies have been estimated to be unplanned in most developing countries (Adhikari, et al., 2009).

Globally, unplanned pregnancy has been caused mostly by the non-use of contraceptives or contraceptive failure (Adhikari, et al., 2009; Shokravi & Chapman, 2004). The problem of contraceptive failure has contributed to 50% of unplanned pregnancy in the United States (Adhikari, et al., 2009). A recurrent consequence of unplanned pregnancy is abortion, and the consequences of this ranges from maternal morbidity (infertility) to mortality especially in developing countries (Adhikari, et al., 2009). In a study conducted in Nepal in 2009, 41% of all current pregnancies were unplanned (Adhikari, et al., 2009). A number of factors were discovered to influence unplanned pregnancy, the strong predictors include; age of women, the ideal number of children, women's age at first marriage, radio exposure, spousal communication, religion and the knowledge of family planning (Adhikari, et al., 2009). Another study is Tehran revealed that 31.7% of women experienced unplanned pregnancy and this was attributed to contraceptive failure (Shokravi & Chapman, 2004). This study emphasized the need to improve women's education as a way of combating unplanned pregnancy (Shokravi & Chapman, 2004).

In all, to reduce the issues associated with unplanned pregnancy globally, information and access to reproductive health services need to be more widespread (Adhikari, et al., 2009).

2.1.2 UNPLANNED PREGNANCY IN AFRICA

Literature has revealed that maternal death, infant mortality, child mortality and high fertility rate remain a daunting challenge in Africa (Wado, et al., 2013; Mojekwu & Ibekwe, 2012; Obare, et al., 2012). Sub-Saharan Africa accounts for 56% of all maternal deaths in the world (Wado, et al., 2013). According to literature, more than half of the maternal deaths in the developing world occur in Africa (Mojekwu & Ibekwe, 2012). In most African countries, unplanned pregnancy has been argued to be associated with low use of maternal health care services, which results in poor maternal and child health outcomes (Obare, et al., 2012). In sub-Saharan Africa, for every 100 000 live births, as much as 903 women die as a result of pregnancy related complications and child birth; with also 38 new born deaths in every 1 000 live births (Singh et al., 2009). It has been found that in most African countries, women who experience unplanned pregnancy resort to abortions which mostly are unsafe forms of abortion (Faye, et al., 2013; Obare, et al., 2012). Exposure to repeated unplanned pregnancies is an indication of unprotected sexual intercourse, either due to the fact that there is no knowledge about contraception or non-use of contraception (Obare, et al., 2012).

According to a study conducted in 2008, unplanned pregnancy was found to be a major problem in sub-Saharan Africa, with women aged 15-24 years contributing to 44% of unplanned pregnancy (Hubacher, et al., 2008). Another study conducted in Senegal revealed that compared to women who do not experience unplanned pregnancy, women who usually experience unplanned pregnancy are mostly older, not married, have a high parity, and are usually poorer (Faye, et al., 2013). Although, married women also experience unplanned pregnancy, this is indicative of the level of unmet need for contraception in most African countries (Faye, et al., 2013).

Literatures also showed that studies on the identification and prevention of unplanned pregnancy in Africa countries have generated a lot of attention. And this is important in order to be able to combat the negative impact of unplanned pregnancy on fertility, infant, child and maternal health outcome which is necessary to improve maternal and child care. This study will also add to this body of knowledge and help form policies to combat unplanned pregnancy.

2.1.3 UNPLANNED PREGNANCY IN ETHIOPIA

Unplanned pregnancy is a major public health issue that negatively affects the health outcome of both mother and child in most African country, especially Ethiopia (Habte, et al., 2013). Over the years in Ethiopia, there has been a slight decrease in the level of pregnancies that were not wanted: 17% in 2000, 16% in 2005, and 9% in 2011; but the percentage of pregnancy wanted later (25%) has been stagnant over the years (Habte, et al., 2013). Studies that have been conducted in Ethiopia have shown that unplanned pregnancy varied from one region to another (Teshome, et al., 2014; Habte, et al., 2013; Wado, et al., 2013), which indicates varying intervention programs are anticipated in different regions.

Studies conducted on unplanned pregnancy have indicated that factors that predispose women of reproductive age to unplanned pregnancy may include factors related to the woman, her spouse or partner, her family, the society, health facilities and health workers that work in these facilities (Habte, et al., 2013; Wado, et al., 2013; Worku & Fantahun, 2006).

The death that results from pregnancy-related issues is a cause for concern in Ethiopia. It has been discovered from literature that the level of maternal care remains very low in Ethiopia compared to other countries in sub-Saharan Africa and Africa as a whole (Wado, et al., 2013).

2.2 THEORETICAL FRAMEWORK

The theoretical frameworks employed in this study were: framework for analyzing the determinants of maternal mortality by James McCarthy and Deborah Maine (McCarthy & Maine, 1992), and the ecological determinants of health framework by Bronfenbrenner in 1979.

McCarthy and Maine framework was based on the effort to reduce maternal mortality, which must operate through reducing the likelihood that a woman will become pregnant, or reducing the likelihood that a pregnant woman will experience a serious complication of pregnancy or childbirth or improving the outcomes for women with complications (McCarthy & Maine, 1992). The concept behind the framework is the basic stages in the process that result into maternal morbidity and maternal mortality (McCarthy & Maine, 1992).

McCarthy and Maine's framework for analyzing the determinants of maternal mortality is organized around three components of the maternal mortality process (McCarthy & Maine, 1992). According to this framework, pregnancy and pregnancy-related complications, which are outcomes that culminates in maternal morbidity or mortality, are closest to the event of maternal mortality (McCarthy & Maine, 1992). This framework also indicated that pregnancy outcomes is most directly influenced by five sets of intermediate determinants, which includes; the health status of the woman, the reproductive status of the woman, the access to health services by the woman, the health care behavior of the woman (which also includes the use of health services by the woman), and a set of unknown factors that affects the woman (McCarthy & Maine, 1992). Another set of factors considered in this framework are the distal factors which are a set of socioeconomic and cultural background factors (McCarthy & Maine, 1992).

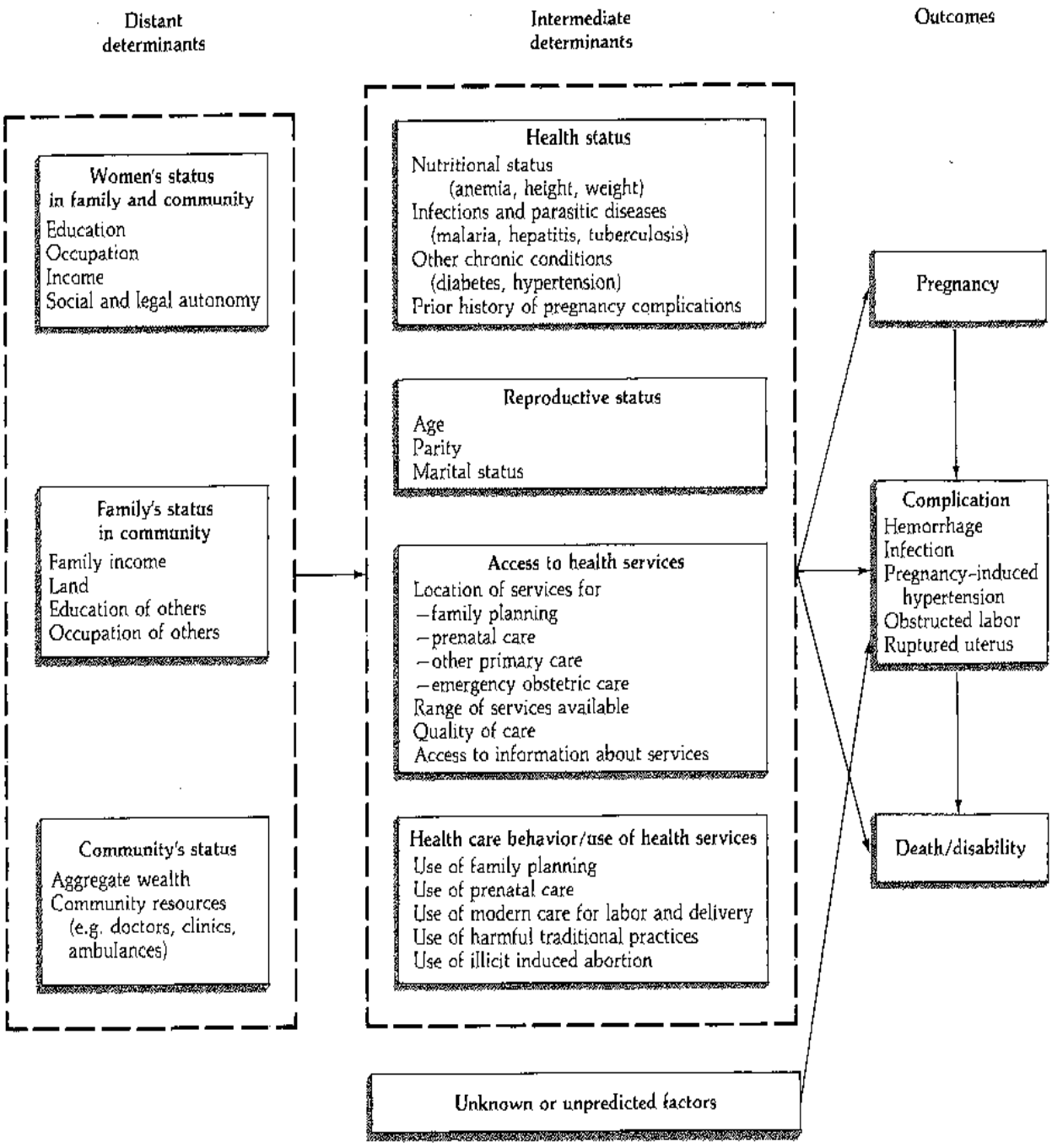


Figure 2.1: A detailed framework for analyzing the determinants of maternal mortality and morbidity (McCarthy & Maine, 1992)**.**

This framework developed by McCarthy and Maine was aimed at reducing maternal mortality related to the identification of three major outcomes that result in maternal mortality; conception,

a complication and treatment of complications (McCarthy & Maine, 1992).This study thus adapted conception as one of the major factors that contribute to maternal mortality (McCarthy & Maine, 1992). By reducing the number of pregnancies especially those that are not planned for, the risk that a woman in her reproductive years will die from pregnancy-related cause will reduce (McCarthy & Maine, 1992).

Bronfenbrenner's ecological theory takes into consideration individual and environmental factors as important factors in health determinants (Bronfenbrenner & Morris, 1998). He opined that the ecological model will give a holistic approach to analyze both the multilevel and the interactive influences of health outcomes (Bronfenbrenner & Morris, 1998). According to Bronfenbrenner, ecological environment (that is the individual, social and community characteristics) highly influence the interaction various health outcomes (Bronfenbrenner & Morris, 1998).

The ecological theory was divided into four components; process, person, context and time (Krishnan, 2010). The process encompasses the interactions between individuals and the immediate surroundings that affect their general wellbeing (Krishnan, 2010). This also includes the distal processes at work influencing health outcomes, which include family factors as well as other environmental factors like community resources or social classes (Krishnan, 2010). The person component of the ecological theory indicates that the individual itself determines the influence of family and caregivers, for example, individuals with disabilities are more prone to negative social relationships (Krishnan, 2010). The context component, which is perhaps the most important in Bronfenbrenner's theory, refers to the multiple avenues modifying proximal processes (which include the environment with constant interactions) (Bronfenbrenner & Morris, 1998). The context consists of the micro, meso, exo and macro with each having direct or

indirect influence. The time component highlights chronological age, duration and nature of periodicity of a particular influence (Krishnan, 2010).

The ecological model highly recognizes the importance of multilevel environments and the interactions among them as key in determining a particular health event, for example in the case of unplanned pregnancy in this study (Krishnan, 2010) (Bronfenbrenner & Morris, 1998).

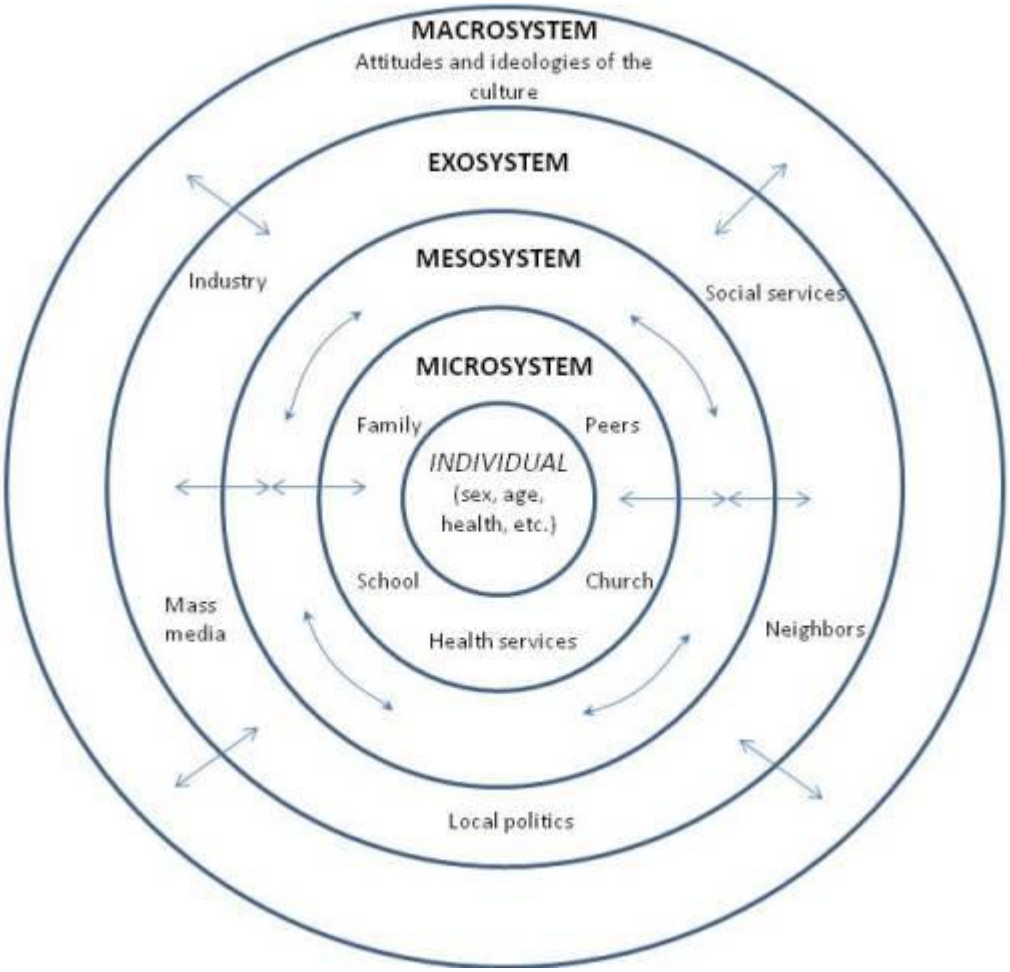


Figure 2.2: Bronfenbrenner ecological determinant of health framework (Bronfenbrenner & Morris, 1998)**.**

2.3 CONCEPTUAL FRAMEWORK

The conceptual framework used in this study was adapted from two frameworks. The first one is the framework for analyzing the determinants of maternal mortality by James McCarthy and Deborah Maine (McCarthy & Maine, 1992); incorporating various literatures that were based on unplanned pregnancy. The second framework is the ecological determinants of health framework by Bronfenbrenner in 1979. The frameworks used in this study conceptualize on how various factors at each level of operation will affect unplanned pregnancy.

The framework by McCarthy & Maine in 1992 is organized into three general stages that explains maternal mortality emanating from pregnancy and pregnancy complications. Pregnancy outcomes according to this framework is influenced by: the health status of the woman, the reproductive status of the woman, the access of the woman to health services, the health care behavior of the woman and a set of other unknown factors (these are the intermediate determinants). The distant determinants in this framework are the socioeconomic and cultural factors that affects the intermediate factors.

This study therefore adapted the framework for analyzing unplanned pregnancy which is also an health outcome that can lead to maternal morbidity and/or maternal mortality. Pregnancy is an important phase in a woman's reproductive years which most women go through; and can predispose them to disability or death in some cases. Therefore this framework was used to understand the individual or scioeconomic characteristics, the household and community factors that influence the knowledge or use of contraceptives to result in either a planned or unplanned pregnancy.

According to Bronfenbrenner in 1998 using his ecological determinants of health framework, “any form of child development occurs through processes of progressively more complex interaction between an active child and the persons, objects and symbols in the immediate environment” (Bronfenbrenner & Morris, 1998). Bronfenbrenner added that the ecological environment is a the set of nested structures, each inside the next (Bronfenbrenner & Morris, 1998). The environment in all cases influences any form of relationship. This framework accounts for the interaction effects between various levels of health outcomes, that is individual, social and community effects. This framework places independent variables at the levels of community, household and individual level characteristics.

For the purpose of this study, the ecological determinants of health framework was used to understand how commuinty factors account for variations of health outcomes, which is unplanned pregnancy. This study will examine how the interactions of the community and household factors will affect unplanned pregnancy.

These frameworks were adapted and modified in this study. The distant determinants in this study were the individual factors (which includes: age, marital status, educational level, occupation, surviving children, religion,spouse education and spouse occupation), the household factors (which includes: head of household, marriage type, household or family size, and household wealth idex) and the community factors(which includes: region of residence, place of residence, community family planning services, community female employment, community level of female education and community poverty). The intermediate variables used in this study were the knowledge and use of contraception and the planning of pregnancy being the outcome.

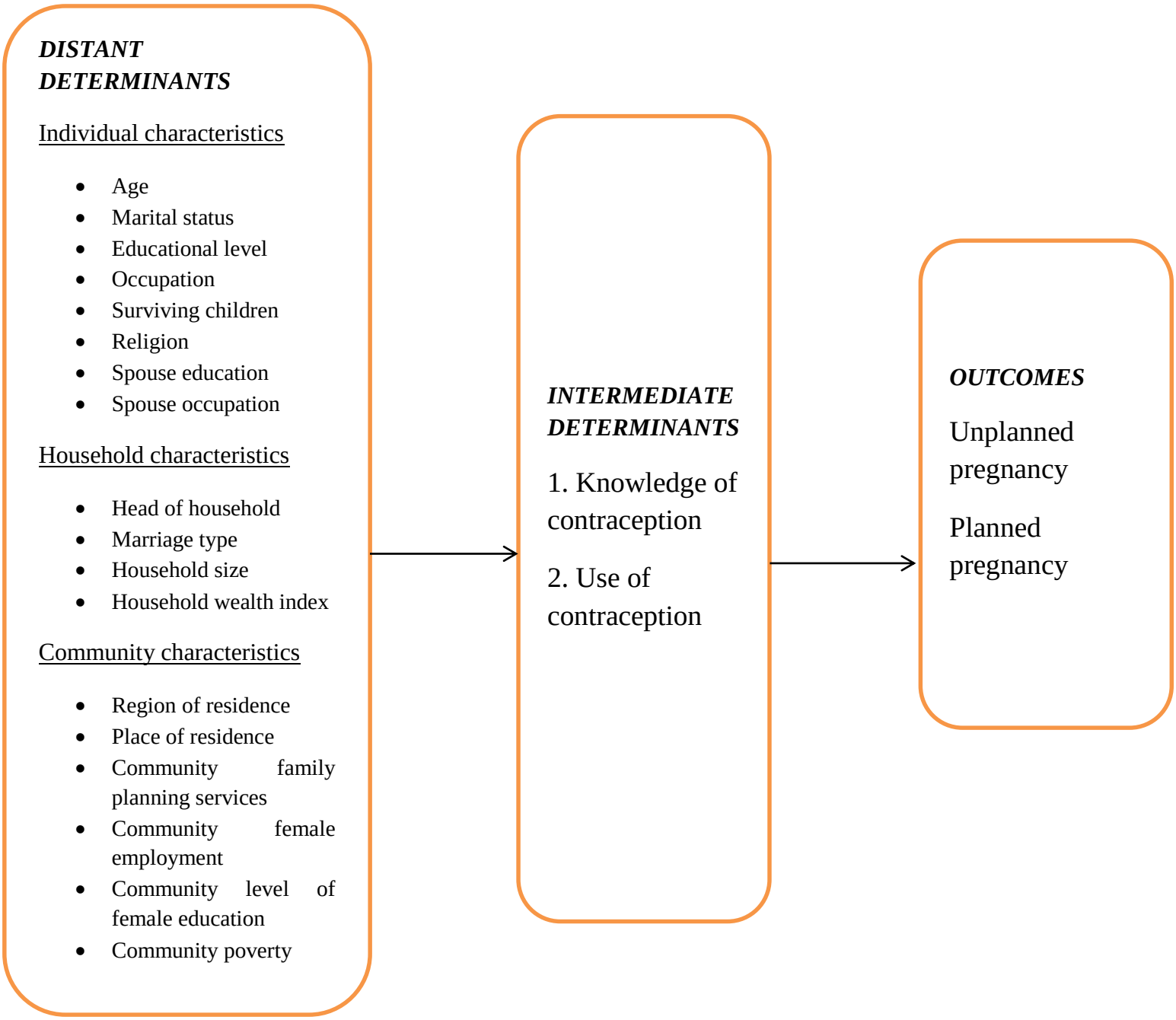


Figure 2.3: Conceptual Framework for the Study of the Correlates of Unplanned Pregnancy in Ethiopia (adapted from McCarthy and Maine; and Bronfenbrenner frameworks).

2.4 RESEARCH HYPOTHESES

- There is a significant association between unplanned pregnancy and knowledge of contraception.
- There is a significant association between unplanned pregnancy and contraceptive use
- There is a significant association between unplanned pregnancy and community-level factors.

CHAPTER THREE

3.0 METHODOLOGY

3.1 INTRODUCTION

This chapter presented description of the study area, data source, study design, study population, ethical issues, the variables used for analysis and a detailed description of the analysis plan used to achieve each of the objectives highlighted.

3.2 STUDY AREA

The study area is Ethiopia. Ethiopia is situated in the horn of Africa; it is bordered to the north and northeast by Eritrea, to the south by Kenya, to the east by Djibouti and Somalia, and to the west by Sudan and South Sudan. Ethiopia is the second most populated country in Africa (Ethiopia Central Statistical Agency & ICF International, 2012). Ethiopia is structured into two city administrations, which includes Addis Ababa administrative council and Dire Dawa administrative council; and nine regional states- Tigray, Affar, Amhara, Oromiya, Somali, Benishangul-Gumuz, Southern Nations Nationalities and People (SNNP), Gambela and Harari (Ethiopia Central Statistical Agency & ICF International, 2012).

The population of Ethiopia has continually increased over the decade, from 42.6 million in 1984 to 53.5 million in 1994 to 73.8 million in 2007 to 93.8 million in 2013 (CIA-World-Factbook, 2013; EDHS, 2011). Ethiopia, which is one of the least urbanized countries in the world, has only 16% of its population in urban areas (Ethiopia Central Statistical Agency & ICF International, 2012).

3.3 DATA SOURCES

This study utilized data from the 2011 Ethiopian Demographic and Health Survey (EDHS). The 2011 EDHS provided information on the demographic and health indicators at all levels.

3.4 STUDY DESIGN

This study made use of analytical cross-sectional study, the 2011 Ethiopian Demographic and Health Survey.

3.5 STUDY POPULATION

The study population was women in the reproductive aged group (15-49), who did not want the most recent pregnancy when they became pregnant. The analytic sample for this study was 7 764 women.

3.6 ETHICS

This study was solely quantitative and a secondary data was used. The Ethiopian Demographic and Health Survey data are completely anonymous and it also protects the identity of all the respondents. The Ethics Committee of the Opinion Research Corporation Macro International Incorporated (ORC Macro Inc., Calverton, USA) and the Central Statistical Agency (CSA, Addis Ababa, Ethiopia) approved the conduct of the survey.

3.7 VARIABLES

3.7.1 OUTCOME VARIABLE

The main outcome variable analyzed was unplanned pregnancy. Unplanned pregnancy was defined as pregnancy not wanted at the time of conception. For this study, the question for the outcome variable in the Ethiopia Demographic and Health Survey was phrased as “wanted

pregnancy when became pregnant last?"- Binary coding was used. If the woman had unplanned pregnancy, that is 'yes' to the question was coded '1' and those that did not have unplanned pregnancy that is 'no' to the question was coded '0'.

3.7.2 EXPLANATORY VARIABLES

The explanatory variables in this study included variables at the individual level, household level and community level. The selection of these variables was based solely on literatures that were reviewed.

3.7.2.1 INDIVIDUAL-LEVEL VARIABLES

The individual-level variables used included; age, marital status, educational level, occupation, surviving children, religion, spouse education and spouse occupation. The individual level characteristics were chosen based on literatures and relevance to this study relating to planned or unplanned pregnancy.

Table 3.1: Individual-level variables: definition and coding.

Variable	Definition	Coding
Age	Age (in years) of respondent	(1)15-19, (2)20-24, (3)25-29, (4)30-34, (5)35-39, (6)40-44, (7)45-49
Marital status	The current marital status of respondent	(1)never married, (2)currently married, (3)formerly married
Educational level	The highest education level of respondent	(1)no education, (2)incomplete education, (3)complete education, (4)higher
Occupation	The occupation status of respondent	(1)unemployed, (2)employed
Surviving children	The numbers of children the respondent has, that are still alive.	(1)0, (2)1, (3)2, (4)3+

Religion	The religious affiliation of respondent	(1)Christian, (2)Muslim, (3)Traditional
Spouse education	The educational status of the spouse	(1)no education, (2)primary education, (3)secondary education, (4)higher education
Spouse occupation	The occupation status of the spouse.	(1)unemployed, (2)agriculture, (3)others

3.7.2.2 HOUSEHOLD-LEVEL VARIABLES

The household-level variables used in this study included; head of household, marriage type, household size and household wealth index. The household level characteristics were reported by the head of households in this survey; and were selected based on the relevance of to the study guided by literatures.

Table 3.2: Household-level variables: definition and coding.

Variables	Definition	Coding
Head of household	The sex of the head of the household.	(1)male, (2)female
Marriage type	The type of marriage.	(1)monogamous, (2)polygynous
Household (Family) size	The number of household members.	(1)1-6, (2)7+
Household wealth index	The measure of the wealth status of the household.	(1)poor, (2)middle, (3)rich

3.7.2.3 COMMUNITY-LEVEL VARIABLES

The community-level variables used in this study included; region of residence, place of residence, community family planning services, community female employment, community level of female education, and community poverty. The community-level characteristics represent individual responses that would be aggregated by community; the responses from the household surveys pertaining to some characteristics were aggregated for specific geographical

locations for the purpose of multilevel analysis. By the use of Stata software, the community-level characteristics, apart from region of residence and place of residence, were aggregated at the level of the primary sampling unit. The aggregation was done by Stata first collapsing the variables and divided it into 3 quantile (low, medium and high); the average determines the categorization into low, medium and high.

Table 3.3: Community-level variables: definition and coding.

Variables	Definition	Coding
Region of residence	The geopolitical zone where respondents live.	(1)north (tigray, affar, amhara), (2)south (oromiya, snnp), (3)west (benishangul-gumuz, gambela), (4) east (harari, dawa dire), (5)central(addis ababa)
Place of residence	The type of place of residence of respondents.	(1)urban, (2)rural
Community family planning services	Proportion of access to family planning services.	(1)low, (2)medium, (3)high
Community female employment	Proportion of employment in the community.	(1)low, (2)medium, (3)high
Community level of female education	Proportion of women who had at least secondary education.	(1)low, (2)medium, (3)high
Community poverty	Proportion of respondents from poor household (community wealth index).	(1)poor, (2)middle, (3)high

3.7.3 INTERMEDIATE VARIABLES

The intermediate variables used in this study were the knowledge and use of contraception. The two variables had binary responses, (yes/no), to the questions on if the respondents know about contraception or have used any form of contraception. The selection of these variables was based solely on literatures that were reviewed.

3.8 ANALYSIS PLAN

To be able to address the research question in the study, each of the research objectives was addressed.

3.8.1 FIRST OBJECTIVE

To examine the levels of unplanned pregnancy and ascertain the factors associated with unplanned pregnancy in Ethiopia; descriptive statistics was employed and chi-square test (i.e. bivariate analysis) was carried out to address this objective. Percentage distribution was used for estimating the levels of unplanned pregnancy in Ethiopia. The rates of pregnancies that were unplanned was also be generated. The equation for the rate that was generated as:

$$\frac{\text{Number of unplanned pregnancies}}{\text{Total pregnancies (planned and unplanned)}} \times 10\,000 = \text{rate of unplanned pregnancies per } 10\,000.$$

The chi-square equation is:

$$\chi^2 = \sum (o-e)^2/e.$$

Where; χ^2 is chi-square, $\sum$ is summation, o is observed and e is expected.

3.8.2 SECOND OBJECTIVE

To identify community factors associated with unplanned pregnancy in Ethiopia, a multi-level analysis was carried out to address this objective.

3.8.3 THIRD OBJECTIVE

To determine the extent to which contextual factors account for variations in unplanned pregnancy in Ethiopia, a multi-level analysis was carried out. The outcome variable used in this study was binary, that is a ‘yes’ or ‘no’ response. Therefore a two-level multilevel logistic regression model was applied; the micro levels (level 1) were nested within the macro level (level 2). These two- level model included standard logistic regression model, being the first and

the second accounted for additional, related characteristics. The equation for the two-level model for binary outcome used was:

$\text{Log}\,[p_{ij}/(1-p_{ij})] = \beta_0 + \beta_1 x_{ij} + u_j$ (combined model)

Where: u_j is the random effect at level two. Conditional on u_j, y_{ij}s were assumed to be independent (Guo & Zhao, 2000). Fixed effects and random effects, which are very important concepts in multilevel analysis, were used in results interpretation for this study. The odds ratio produced was expressed at a 95% confidence interval. While the fixed effects, expressed as odd ratios (ORs) and 95% confidence intervals (95% CIs),were used to model associations; random effects (u_j) are useful in modelling in unplanned pregnancy across communities. Multilevel modelling, measures of variations such as of variations such as variance partition coefficient, intra-class correlation and proportional change in variance, are good measures that provide good understanding of contextual determinants in individual health (Merlo, et al., 2005).

The random effects (i.e measures of variation) were expressed as variance partition coefficient (VPC) and percentage change in variance (PCV). The ratio of the variance at the community level to the total variance is referred to as the intra-class correlation (ICC). The ICC is important for assessing the degree of homogeneity within units such as families or communities (Griffiths, et al., 2004).The VPC, which in this study is equal to intra-class correlation (ICC), is the measure of the extent to which households resemble each other more than they resemble other communities in the sample (Antai, 2011). A large ICC indicated that household and community factors are important in understanding unplanned pregnancy, while an ICC close to zero indicated that individual and community-level factors exert only a small influence on unplanned

pregnancy. Precision was evaluated using the standard error (SE) of the explanatory or independent variables (Antai, 2011).

$VPC_1/ICC_1/PCV_1 = (V_{N-1} - V_{N-2}) / V_{N-1}$

V_{N-1} is the community variance in the empty model and V_{N-2} is the community variance in the models which includes the individual characteristics or the community characteristics (Merlo, et al., 2006).

In 2002, Goldstein and his colleagues presented VPC as the percentage of variations in a data set that is attributed to a particular level or classification in the data set used (Goldstein, et al., 2002)

In this study, the measures of variations represent the extent to which women in the same neighborhood or community were exposed to the same situations (experiencing unplanned pregnancy). Multilevel modelling technique was therefore required for this study to remove the effect of clustering, to study the effect of variables at different levels and to examine the variation of the effect across the levels. Due to the hierarchical nature of the data used, the effect of clustering needed to be removed in order to obtain valid point estimates for the study parameters and standard errors for point estimates (Vu, 2005). It was therefore necessary for the purpose of this study to examine the effect of each explanatory variable and understand the extent of the variation across the different levels.

Five models with different combinations of the individual, household and community variables were produced to clearly show the variations, which included:

- Model 0 was the empty or null model (an empty model decomposed the total variance into individual, household and community components. It is usually without any variable).
- Model 1 considered the independent variable at the community level and the outcome of unplanned pregnancy.
- Model 2 considered only the region of residence covariate in order to examine the independent influence of region on the outcome of unplanned pregnancy.
- Model 3 considered the independent variable at individual and household level and the outcome of unplanned pregnancy.
- Model 4 considered the incorporation of all the independent variables-individual, household and community variables and the outcome of unplanned pregnancy (full model).

  *stepwise logistic regression was carried out before fitting variables in each of the models.

3.9 STUDY STRENGTHS AND LIMITATIONS

This study made use of a nationally representative data, which gives some forms of advantages like: the EDHS data allow for generalization of the findings of this study across the country; it allows for comparison due to similar sampling methods and comparable survey instruments; and the use of multilevel analysis is a major strength of this study because previous study on unplanned pregnancy did not put into consideration the influence of contextual factors.

Primary sampling unit was used in this study as a proxy for community, and this may misclassify individuals into inappropriate communities. Apart from the region and place of residence, other community factors were aggregated at the individual and household levels, and could result in

multicollinearity, but this was reduced by testing for correlation and conducting a stepwise regression before running the models. The issue of underreporting and over reporting of unplanned pregnancy is one of the limitations of the study; this is due to the fact that unplanned and planned pregnancies are reported by the women who experience it (Ethiopia Central Statistical Agency & ICF International, 2012). Another limitation is establishing the direction of the causal effects. The data that used for analysis is a cross-sectional data; therefore, it is not possible to determine the direction of causality between the variables of interest (Ononokpono, et al., 2013). There is also the issue of unobserved heterogeneity which could be due to the non-inclusion of other important contextual characteristics in the analysis conducted in this study, e.g. cultural practices, and information on services rendered after last birth due to absence of this information in the EDHS dataset.

Despite these limitations, the main variables of interest in this study were factors associated with the experience of unplanned pregnancy and due to the large size of the study sample; these limitations should have little impact on the scope of the study.

CHAPTER FOUR

4.0 RESULT

In understanding unplanned pregnancy, it was important to consider socio-economic, demographic and contextual attributes of an environment and their contributions to experiencing unplanned pregnancy.

This chapter therefore gave the background statistics of the distribution of unplanned pregnancy in Ethiopia, the rates of unplanned pregnancy by selected socio-economic, demographic and contextual characteristics, as well as results showing the multilevel binary logistic regression with the independent variables at individual, household and community levels.

The first objective was to examine the levels of unplanned pregnancy and ascertain the factors associated with unplanned pregnancy in Ethiopia; descriptive statistics was employed and chi-square test (i.e. bivariate analysis) was carried out to address this objective.

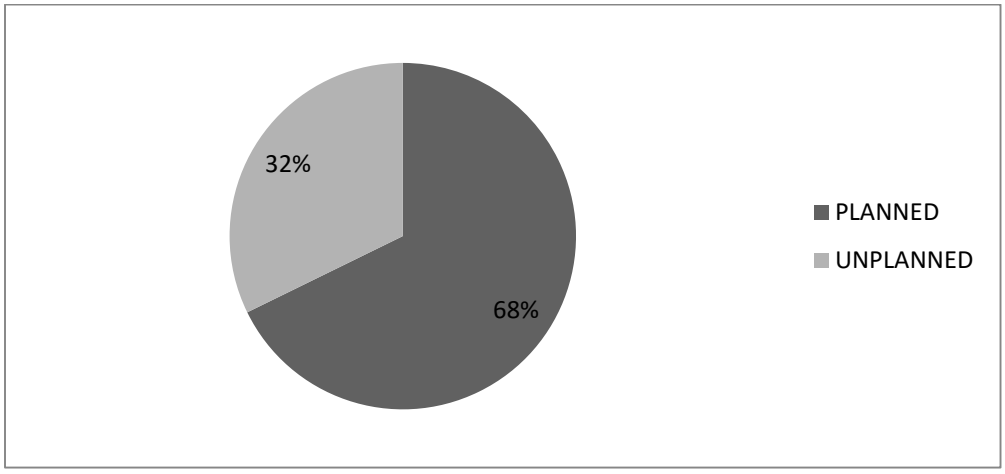


Figure 4.1: Percentage Distribution of Planned and Unplanned Pregnancy in Ethiopia in 2011.

Percentage distribution of pregnancy shows that 32% of pregnancies in Ethiopia in 2011 were unplanned while were 68% were planned as shown by Figure 4.1

Table 4.1: Rates of Unplanned Pregnancy per 10 000 Pregnancies in Ethiopia in 2011.

VARIABLES	FREQUENCIES OF UNPLANNED PREGNANCIES	RATES OF UNPLANNED PREGNANCIES PER 10 000 PREGNANCIES
AGE		
15-19	133	173
20-24	405	528
25-29	550	**716**
30-34	361	470
35-39	314	409
40-44	148	193
45-49	62	81
Total	*1973*	*2570*
MARITAL STATUS		
Never married	47	61
Currently married	1712	**2230**
Formerly married	214	279
Total	*1973*	*2570*
EDUCATION		
No education	1219	**1588**
Incomplete education	634	826
Complete education	74	96
Higher	46	60
Total	*1973*	*2570*
OCCUPATION		
Unemployed	871	1135
Employed	1102	**1435**
Total	*1973*	*2570*
SURVIVING CHILDREN		
0	12	16
1	373	486
2	367	478
3+	1221	**1590**
Total	*1973*	*2570*
RELIGION		
Christian	1232	**1624**
Muslim	702	926
Traditional	22	29
Total	*1956*	*2579*
SPOUSE EDUCATION		
No education	871	**1159**
Primary education	800	1064
Secondary education	144	192
Higher education	91	121
Total	*1906*	*2535*
SPOUSE OCCUPATION		
Unemployed	27	36

Agriculture	1322	**1747**
Others	565	747
Total	*1914*	*2530*
USE OF CONTRACEPTION		
No	1313	**1710**
Yes	660	860
Total	*1973*	*2570*
KNOWLEDGE OF CONTRACEPTIVES		
Knows none	35	46
Knows one	1938	**2524**
Total	*1973*	*2570*
WEALTH INDEX		
Poor	743	968
Middle	359	468
Rich	871	**1135**
Total	*1973*	*2570*
FAMILY SIZE		
1-6	1177	**1533**
7+	796	1037
Total	*1973*	*2570*
MARRIAGE TYPE		
Monogamous	1532	**2209**
Polygamous	170	245
Total	*1702*	*2455*
SEX OF HOUSEHOLD HEAD		
Male household head	1612	**2100**
Female household head	361	470
Total	*1973*	*2570*
REGION		
North (Tigray, Affar and Amhara)	537	699
South (Oromiya and Snnp)	688	**896**
West (Benishangul-gumuz and Gambela)	328	427
East (Harari and Dawa-Dire)	311	405
Central (Addis Ababa)	109	142
Total	*1973*	*2570*
PLACE OF RESIDENCE		
Urban	426	555
Rural	1547	**2015**
Total	*1973*	*2570*
COMMUNITY POVERTY		
Poor	560	729
Middle	848	**1105**
Rich	565	736
Total	*1973*	*2570*
COMMUNITY FAMILY PLANNING SERVICES		
Low	605	788
Medium	829	**1080**
High	539	702
Total	*1973*	*2570*
COMMUNITY FEMALE EMPLOYMENT		
High	502	654
Medium	659	858
Low	812	**1058**
Total	*1973*	*2570*
COMMUNITY FEMALE LEVEL OF EDUCATION		

Low	671	874
Medium	785	**1023**
High	517	673
Total	*1973*	*2570*

Table 4.1 presented the rates of unplanned pregnancy per 10 000 pregnancies by the socio-economic, demographic and contextual characteristics in Ethiopia in 2011.

Women aged 25-29, with a frequency distribution of 550 accounted for the highest rate of unplanned pregnancies with 716 unplanned pregnancies for every 10 000 pregnancies. The lowest rate of unplanned pregnancy was accounted for by women between ages 45-49, with a frequency distribution of 62 (81 unplanned pregnancies per 10 000 pregnancies). Women aged 15-19, 20-24, 30-34, 35-39 and 40-44 had 173, 528, 470, 409 and 193 unplanned pregnancies for every 10 000 pregnancies respectively. Women who are currently married with a frequency distribution of 1 712 accounted for the highest rate of unplanned pregnancies with 2 230 unplanned pregnancies per 10 000 pregnancies; while those that are never married had 61 unplanned pregnancies and those that are formerly married had 279 unplanned pregnancies per 10,000 unplanned pregnancies (with frequency distributions of 47 and 214 respectively). Those with no education with a frequency distribution of 1 219 had 1 588 unplanned pregnancies, those with incomplete form of primary and secondary education with a frequency distribution of 634 had 826 unplanned pregnancies, those with complete primary and secondary education with a frequency distribution of 74 had 96 unplanned pregnancies and those with higher education with a frequency distribution of 46 had 60 unplanned pregnancies, all per 10 000 pregnancies. Unemployed women, with a frequency distribution of 871, had 1 135 unplanned pregnancies per 10 000 pregnancies the employed ones, with a frequency distribution of 1 102, had 1 435 unplanned pregnancies per 10 000 pregnancies. Women with 3 or more number of children

surviving with a frequency distribution of 1 221 had 1 590 unplanned pregnancies per 10 000 pregnancies while others with no child surviving, one child surviving and two children surviving (with frequency distributions of 12, 373 and 367 respectively) had 16, 486 and 478 unplanned pregnancies per 10 000 pregnancies respectively. Christian women, with a frequency distribution of 1 232, had 1 624 unplanned pregnancies per 10 000 pregnancies; Muslim women, with a frequency distribution of 702, had 926 unplanned pregnancies per 10 000 pregnancies and those who are traditionalists, with a frequency distribution of 22, had 29 unplanned pregnancies per 10 000 pregnancies. Women whose spouse had no education, with a frequency distribution of 871, had 1 159 unplanned pregnancies; those whose spouse had primary education, with a frequency distribution of 800, had 1 064 unplanned pregnancies; those whose spouse had secondary education, with a frequency distribution of 144, had 192 unplanned pregnancies; and those whose spouse had higher education, with a frequency distribution of 91, had 121 unplanned pregnancies, all per 10 000 pregnancies.

Women with no form of contraception, having a frequency distribution of 1 313, accounted for 1 710 unplanned pregnancies per 10 000 pregnancies; and those contracepting, with a frequency distribution of 660, accounted for 860 unplanned pregnancies per 10 000 pregnancies. Women with the knowledge of at least a method of contraception, having a frequency distribution of 1 938, accounted for 2 524 unplanned pregnancies per 10 000 pregnancies while those who have no knowledge of any method of contraception, with a frequency distribution of 35, accounted for 46 unplanned pregnancies per 10 000 pregnancies.

Women who belong to the rich households, with a frequency distribution of 871, accounted for the highest rate of unplanned pregnancies (1 135 unplanned pregnancies per 10 000 pregnancies); while those in the poor and moderately-wealthy households, with frequency

distributions of 743 and 359, had 968 and 468 unplanned pregnancies per 10 000 pregnancies respectively. Those in household consisting of one to six members, with a frequency distribution of 1 177, had 1 533 unplanned pregnancies per 10 000 pregnancies while those with seven or more household members, with a frequency distribution of 796, had 1 037 unplanned pregnancies per 10 000 pregnancies. Women in monogamous marriage, with a frequency distribution of 1 532, had 2 209 unplanned pregnancies; while those in polygamous marriage, with a frequency distribution of 170, had 245 unplanned pregnancies per 10 000 pregnancies. Women in male-headed households, with a frequency distribution of 1 612, had 2 100 unplanned pregnancies per 10 000 pregnancies; while those in female-headed households, with a frequency distribution of 361, had 470 unplanned pregnancies per 10 000 pregnancies.

Women residing in the southern region (Oromiya and Snnp) of Ethiopia, with a frequency distribution of 688, accounted for the highest rate of unplanned pregnancies with 896; while those residing in the north (Tigray, Affar and Amhara), west (Benishangul-gumuz and Gambela), east (Harari and Dawa Dire) and central (Addis Ababa), with frequency distributions of 537, 328, 311 and 109, had 699, 427, 405 and 142 unplanned pregnancies per 10 000 pregnancies respectively. Women in rural areas, with a frequency distribution of 1 547, had 2 015 unplanned pregnancies per 10 000 pregnancies while their counterparts in urban areas, with a frequency distribution of 426, had 555 unplanned pregnancies per 10 000 pregnancies. Women resident in communities with high concentration of poor households, with a frequency distribution of 560, had 729 unplanned pregnancies per 10 000 pregnancies; those in communities with moderate concentration of poor households, with a frequency distribution of 848, accounted for 1 105 unplanned pregnancies per 10 000 pregnancies; while those in communities with low concentration of poor households, with a frequency distribution of 565, had 736 unplanned

pregnancies per 10 000 pregnancies. Women residing in communities with moderate concentration of family planning services, with a frequency distribution of 829, accounted for the highest (1 080 unplanned pregnancies per 10 000 pregnancies); while those residing in communities with low concentration and high concentration of family planning services, with frequency distributions of 605 and 539, had 788 and 702 unplanned pregnancies per 10 000 pregnancies respectively. Women resident in communities with low concentration of female employment, with a frequency distribution of 812, had 1 058 unplanned pregnancies; those in community with moderate concentration of female employment, with a frequency distribution of 659, had 858 unplanned pregnancies; and those with high concentration of female employment, with a frequency distribution of 502, had 654 unplanned pregnancies, all per 10 000 pregnancies. Women residing in communities with moderate level of female education, with a frequency distribution of 785, had 1 023 unplanned pregnancies per 10 000 pregnancies; while those residing in communities with high and low level of female education, with frequency distributions of 517 and 671, had 673 and 874 unplanned pregnancies per 10 000 pregnancies respectively.

Table 4.2: Chi-square Analysis Result Showing the Association between Planned and Unplanned Pregnancies, and Independent Variables in Ethiopia in 2011.

VARIABLES	PLANNED PREGNANCY		UNPLANNED PREGNANCY	
INDIVIDUAL AND HOUSEHOLD LEVEL INDEPENDENT VARIABLES				
	Percentage distribution	Frequency distribution	Percentage distribution	Frequency distribution
AGE (p= 0.0969)				
15-19	4.97	279	5.31	133
20-24	20.95	1 173	19.19	405
25-29	30.87	1 722	29.02	550
30-34	19.43	1 136	17.83	361
35-39	14.78	865	16.88	314
40-44	6.63	394	8.29	148
45-49	2.38	135	3.48	62

Total	100	5 704	100	1 973
MARITAL STATUS (**p= 0.0000**)				
Never married	0.18	19	2.46	47
Currently married	92.19	5 254	88.12	1 712
Formerly married	7.63	431	9.42	214
Total	100	5704	100	1 973
EDUCATION (p= 0.5463)				
No education	67.32	3 906	65.01	1 219
Incomplete education	28.36	1 468	30.47	634
Complete education	2.61	205	2.49	74
Higher	1.71	125	2.03	46
Total	100	5 704	100	1 973
OCCUPATION (**p= 0.0031**)				
Unemployed	46.85	3 161	40.45	871
Employed	53.15	2 543	59.55	1 102
Total	100	5 704	100	1 973
SURVIVING CHILDREN (**p= 0.0001**)				
0	1.27	71	0.46	12
1	21.01	1 223	15.27	373
2	20.03	1 115	17.84	367
3+	57.69	3 295	66.44	1 221
Total	100	5 704	100	1 973
RELIGION (**p= 0.0478**)				
Christian	64.47	2 958	69.29	1 232
Muslim	34.58	2 632	29.41	702
Traditionalist	0.96	38	1.29	22
Total	100	5 628	100	1 973
SPOUSE EDUCATION (p=0.1584)				
No education	50.42	2 924	47.53	871
Primary education	40.02	1 967	43.42	800
Secondary education	5.90	442	4.82	144
Higher education	3.65	279	4.23	91
Total	100	5 612	100	1 906
SPOUSE OCCUPATION (p= 0.5653)				
Unemployed	0.76	119	0.95	27
Agriculture	78.47	3 997	76.62	1 322
Others	20.77	1 536	22.43	565
Total	100	5 652	100	1 914
WEALTH INDEX (**p= 0.0040**)				
Poor	45.29	2 851	39.35	743
Middle	20.28	870	21.54	359
Rich	34.43	1 983	39.11	871
Total	100	5 704	100	1 973
FAMILY SIZE (**p=0.0000**)				
1-6	68.33	3 746	58.16	1 177
7+	31.67	1 958	41.84	796
Total	100	5 704	100	1 973
MARRIAGE TYPE (**p= 0.0421**)				
Monogamous	88.56	4 471	91.31	1 532
Polygamous	11.44	761	8.69	170
Total	100	5 232	100	1 702
SEX OF HOUSEHOLD HEAD (p=0.2582)				
Male household head	83.01	4 517	84.61	1 612
Female household head	16.99	1 187	15.39	361
Total	100	5 704	100	1 973

INTERVENING VARIABLES				
USE OF CONTRACEPTION (**p= 0.0001**)				
No	74.72	4 488	66.95	1 313
Yes	25.28	1 216	33.05	660
Total	100	5 704	100	1 973
KNOWLEDGE OF CONTRACEPTIVES (**p=0.0001**)				
Knows none	2.74	381	0.82	35
Knows one	97.26	5 323	99.18	1 938
Total	100	5 704	100	1 973
COMMUNITY LEVEL INDEPENDENT VARIABLES				
REGION (**p= 0.0000**)				
North (Tigray, Affar and Amhara)	33.53	1 953	30.96	537
South (Oromiya and Snnp)	58.42	1 449	64.09	688
West (Benishangul-gumuz and Gambela)	1.63	937	1.39	328
East (Harari and Dawa Dire)	4.01	1 132	1.13	311
Central (Addis Ababa)	2.41	233	2.43	109
Total	100	5704	100	1 973
PLACE OF RESIDENCE (p= 0.4828)				
Urban	14.71	1 073	15.65	426
Rural	85.29	4 631	84.35	1 547
Total	100	5 704	100	1 973
COMMUNITY POVERTY (**p= 0.0010**)				
Poor	35.49	2 427	27.51	560
Middle	41.58	2 047	45.48	848
Rich	22.93	1 230	27.01	565
Total	100	5 704	100	1 973
COMMUNITY FAMILY PLANNING SERVICES (**p= 0.0001**)				
Low	38.17	2 486	28.81	605
Medium	40.98	1 974	47.15	829
High	20.85	1 244	24.04	539
Total	100	5 704	100	1 973
COMMUNITY FEMALE EMPLOYMENT (**p= 0.0001**)				
High	18.43	2 158	11.76	502
Medium	36.43	1 681	35.99	659
Low	45.14	1 865	52.25	812
Total	100	5 704	100	1 973
COMMUNITY FEMALE LEVEL OF EDUCATION (**p= 0.0181**)				
Low	40.49	2 605	34.11	671
Medium	39.90	2 016	42.60	785
High	19.61	1 083	23.29	517
Total	100	5 704	100	1 973

Using the chi-square analysis results as presented in Table 4.2, marital status, occupation or employment status, number of surviving children, religion, wealth index, family or household size, marriage type, use of contraception, knowledge of contraception, region, community poverty, community family planning services, community female employment and community level of female education are significantly associated with unplanned pregnancy; while age,

educational level, spouse education, spouse occupation, sex of household head and place of residence did not show any significant association with unplanned pregnancy in Ethiopia in 2011.

The result of the chi-square analysis according to Table 4.2 revealed that, a higher percentage of women who are currently married had unplanned pregnancy (88.12) compared to those who were never (2.46) or formerly (9.42) married. Women with any form of employment had a higher percentage (59.55) of unplanned pregnancy than those that are unemployed (49.45). Women with three or more number of surviving children accounted for the highest percentage of unplanned pregnancy (66.44); compared to those with two (17.84), one (15.27) and no (0.46) surviving children. Women who are Christians accounted for the highest percentage (69.29) of unplanned pregnancy by religion, compared to the Muslims (29.41) and traditionalists (1.29). Women in poor households accounted for the highest percentage of unplanned pregnancy (39.35), compared to those in the rich (39.11) and middle (21.54) categories. Women with one to six number of family size accounted for a higher percentage (58.16) of unplanned pregnancy, compared to those with seven or more number of family size (41.84). Women in monogamous marriage accounted for a higher rate of unplanned pregnancy (91.31), than those in polygamous marriage (8.69).

When exploring the use of contraceptives, women who do not use any method of contraception accounted for a higher percentage (66.95) of unplanned pregnancy compared to those who use any method of contraception (33.05). In the same vein, women with no knowledge about any method of contraception had a very high percentage of unplanned pregnancy (99.18) compared to those who know at least a method of contraception (0.82).

Women resident in the southern (Oromiya and Snnp) region accounted for the highest percentage of unplanned pregnancy (64.09), followed by those resident in the northern (Tigray, Affar and Amhara) region (30.96) and then those residing in the western (Benishangul-gumuz and Gambela), eastern (Harari and Dawa Dire) and central (Addis Ababa) region had accounted for 1.39, 1.13 and 2.43 per cent of unplanned pregnancy. Women residing in communities with moderate concentration of poor households accounted for the highest percentage of unplanned pregnancy (45.48), and followed by those residing in communities with high concentration poor households (27.51) and then those residing in communities with low concentration of poor households (27.01). Women resident in communities with moderate concentration of family planning services accounted for the highest percentage of unplanned pregnancy (47.15), while women resident in communities with low concentration and high concentration of family planning services had 28.81 and 24.04 per cent respectively of unplanned pregnancy. Women residing in communities with low concentration female employment accounted for the highest percentage of unplanned pregnancy (52.25) when considering community female employment, followed by those residing in communities with moderate concentration of female employment (35.99), and then those residing in communities with high concentration of female employment (11.76). Women residing in communities with moderate concentration of female education accounted for the highest percentage of unplanned pregnancy (42.6), followed by those residing in communities with low concentration of female education (34.11) and then those residing in communities with high concentration of female education (23.29).

The second and third objectives were to identify the community factors associated with unplanned pregnancy in Ethiopia and to determine the extent to which contextual factors account

for regional variations in unplanned pregnancy in Ethiopia respectively, a multi-level analysis was carried out. The models included;

- Model 0 will be the empty or null model.
- Model 1 will consider the independent variable at the community level and the outcome of unplanned pregnancy.
- Model 2 will consider only the region of residence covariate in order to examine the independent influence of region on the outcome of unplanned pregnancy.
- Model 3 will consider the independent variable at individual and household level and the outcome of unplanned pregnancy.
- Model 4 will consider the incorporation of all the independent variables-individual, household and community variables and the outcome of unplanned pregnancy (full model).

  *stepwise logistic regression was carried out before fitting variables in each of the models.

Table 4.3: Multilevel Binary Logistic Regression and Odds Ratio of Unplanned Pregnancy in Ethiopia in 2011.

VARIABLES	MODEL 0	MODEL 1	MODEL 2	MODEL 3	MODEL 4
INTERVENING VARIABLES					
USE OF CONTRACEPTION					
No**	-	-	-	1.000	1.000
Yes	-	-	-	2.259*	2.135*
KNOWLEDGE OF CONTRACEPTION					
Knows none**	-	-	-	1.000	1.000
Knows one	-	-	-	3.339*	2.854*
INDIVIDUAL AND HOUSEHOLD-LEVEL INDEPENDENT VARIABLES					
AGE					
15-19**	-	-	-	1.000*	1.000
20-24	-	-	-	0.435*	0.436*
25-29	-	-	-	0.230*	0.222*
30-34	-	-	-	0.168*	0.165*

35-39	-	-	-	0.193*	0.185*
40-44	-	-	-	0.236*	0.233*
45-49	-	-	-	0.354*	0.336*
EDUCATION					
No education**	-	-	-	1.000	1.000
Incomplete education	-	-	-	1.209	1.111
Complete education	-	-	-	0.825	0.806
Higher education	-	-	-	1.232	1.224
OCCUPATION					
Unemployed**	-	-	-	1.000	1.000
Employed	-	-	-	1.542*	1.430*
SURVIVING CHILDREN					
0**	-	-	-	1.000	1.000
1	-	-	-	2.060	1.987
2	-	-	-	5.069*	4.847*
3+	-	-	-	8.976*	8.244*
RELIGION					
Christian**	-	-	-	1.000	1.000
Muslim	-	-	-	0.632*	0.718*
Traditionalist	-	-	-	3.878*	3.281*
SPOUSE EDUCATION					
No education**	-	-	-	1.000	1.000
Primary education	-	-	-	1.100	0.969
Secondary education	-	-	-	0.712	0.656
Higher education	-	-	-	0.669	0.608
SPOUSE OCCUPATION					
Unemployed**	-	-	-	1.000	1.000
Agriculture	-	-	-	2.155	1.813
Others	-	-	-	2.404	2.163
WEALTH INDEX					
Poor**	-	-	-	1.000	1.000
Middle	-	-	-	1.365*	1.180
Rich	-	-	-	1.784*	1.421*
FAMILY SIZE					
1-6**	-	-	-	1.000	1.000
7+	-	-	-	2.006*	2.004*
SEX OF HOUSEHOLD HEAD					
Male**	-	-	-		
Female	-	-	-	1.000	1.000
	-	-	-	0.758	0.779
MARRIAGE TYPE					
Monogamous**	-	-	-	1.000	1.000
Polygamous	-	-	-	0.781	0.760
COMMUNITY LEVEL VARIABLES					
REGION					
North** (Tigray, Affar and Amhara)	-	1.000	1.000	-	1.000
South (Oromiya and Snnp)	-	2.772*	2.826*	-	2.839*
West (Benishangul-gumuz and Gambela)	-	2.029*	1.503	-	2.356*
East (Harari and Dawa Dire)	-	1.425	0.978	-	1.845*
Central (Addis Ababa)	-	1.316	2.238*	-	1.522

PLACE OF RESIDENCE										
Urban**	-		1.000		-		-		1.000	
Rural	-		1.266		-		-		1.345	
COMMUNITY POVERTY										
Poor**	-		1.000		-		-		1.000	
Middle	-		1.896*		-		-		1.417	
Rich	-		2.197*		-		-		1.540	
COMMUNITY FP SERVICES										
Low**										
Medium	-		1.000		-		-		1.000	
High	-		1.715*		-		-		1.611*	
	-		1.582		-		-		1.536	
COMMUNITY FEMALE EMPLOYMENT										
High**	-		1.000		-		-		1.000	
Medium	-		1.683*		-		-		1.385	
Low	-		2.348*		-		-		1.686*	
COMMUNITY LEVEL OF FEMALE EDUCATION										
Low**	-		1.000		-		-		1.000	
Medium	-		1.162		-		-		1.014	
High	-		1.410		-		-		1.121	
Fixed effects	OR	SE	OR	SE	OR	SE	OR	SE	OR	SE
Intercept	0.14	0.05	0.54	0.02	0.09	0.04	0.01	0.01	0.002	0.003
Random effects										
• Macro-level	2.01	0.72	1.39	0.48	1.82	0.64	1.35	0.52	1.12	0.45
• Micro-level	4.55	2.53	4.70	2.45	4.62	2.51	4.59	2.73	4.46	2.77
ICC	0.30		0.23		0.28		0.23		0.20	

*denotes p-value less than or equal to 0.05 **denotes reference category.

Having established based on literatures that community level characteristics tend to influence unplanned pregnancy; the multilevel analysis results in Table 4.3 presented the influence of contextual factors on unplanned pregnancy. Four models were fitted in order to examine the effects of contextual factors on unplanned pregnancy. Model 1 which considered independent variables at the community level revealed that compared to women residing in the northern region (Tigray, Affar and Amhara) of Ethiopia, women residing in southern region (Oromiya and Snnp) of Ethiopia were 3 times significantly more likely to experience unplanned pregnancy; while those residing in the western region (Benishangul-gumuz and Gambela) of Ethiopia were 2 times significantly more likely to experience unplanned pregnancy. Compared to women resident in communities with high concentration of poor households, women resident in communities

with moderate and low concentration of poor households were 2 times significantly more likely to experience unplanned pregnancy. Compared to women resident in communities with low concentration of family planning services, women resident in communities with moderate concentration of family planning services were 2 times significantly more likely to experience unplanned pregnancy. Compared to women residing in communities with high concentration of female employment, women residing in communities with moderate and low concentration of female employment were 2 folds significantly more likely to experience unplanned pregnancy. The first model explains 23% of variations in the full model.

Model 2 which considered only the region of residence covariate in order to examine the independent influence of region on the outcome of unplanned pregnancy, revealed that compared to women resident in northern (Tigray, Affar and Amhara) Ethiopia, women resident in southern (Oromiya and Snnp) and central (Addis Ababa) Ethiopia were 3 times and 2 times significantly more likely to experience unplanned pregnancy; while those resident in western (Benishangul-gumuz and Gambela) Ethiopia were 2 times more likely to experience unplanned pregnancy compared to those resident in the north but this was not statistically significant. The second model explains 28% variations in the full model.

Model 3 considered the independent variable at individual and household level and the outcome of unplanned pregnancy revealed that the model explains 20% of variations in the full model. The model showed that compared to women aged 15-19 years, those 20-49 were significantly less likely to experience unplanned pregnancy in Ethiopia in 2011. Women with any form of employment were 2 times significantly more likely to experience unplanned pregnancy compared to those that are unemployed. Compared to women who have no surviving children, women with 2 and 3 or more surviving children were 5 times and 9 times significantly more

likely to experience unplanned pregnancy respectively. With reference to Christians, those who are traditionalists were 4 times significantly more likely to experience unplanned pregnancy. Using the household wealth index, compared to women who belong to poor households, those who belong to moderate and rich households were 2 times significantly more likely to experience unplanned pregnancy. Comparing women in households with members ranging from one to six, their counterpacts in households with seven and more household members were 2 times significantly more likely to experience unplanned pregnancy.

Model 4 considered the incorporation of all the independent variables-individual, household and community variables and the outcome of unplanned pregnancy, which was the full model, revealed that as in model 3, compared to women aged 15-19, those aged 20-49 were less likely to experience unplanned pregnancy. Compared to women with no surviving children, women with two surviving children were 5 times significantly more likely and those with three or more surviving children were 8 times significantly more likely to experience unplanned pregnancy. Women who are traditionalists are 3 times significantly more likely to experience unplanned pregnancy compared to those who are Christians. Compared to women with one to six members in their households, those in households with seven or more members were 2 times significantly more likely to experience unplanned pregnancy. Contextually, compared to women resident in the northern part of Ethiopia, those women resident in the southern (Oromiya and Snnp), western (Benishangul-gumuz and Gambela) and eastern (Harari and Dawa Dire) parts of Ethiopia were 3 times, 2 times and 2 times significantly more likely to experience unplanned pregnancy respectively. Women residing in communities with moderate family planning services are 2 times significantly more likely to experience unplanned pregnancy. Compared to women residing in communities with high concentration of female employment, those women residing

in communities with low concentration of female employment are 2 times significantly more likely to experience unplanned pregnancy. This model explains 20% of all variations in the full model.

Across all the models, characteristics like: education, spouse education, spouse occupation, marriage type, sex of household head, place of residence and community level of female education were statistically not significant.

4.1 TESTING OF HYPOTHESES

The hypotheses were tested using the full model for the multilevel analysis:

H_0: There is no significant association between unplanned pregnancy and knowledge of contraception.

H_1: There is a significant association between unplanned pregnancy and knowledge of contraception.

Here, the study rejects the null hypothesis.

H_0: There is no significant association between unplanned pregnancy and contraceptive use**.**

H_1: There is a significant association between unplanned pregnancy and contraceptive use.

Here, the study rejects the null hypothesis

H_0: There is no significant association between unplanned pregnancy and community-level factors.

H_1: There is a significant association between unplanned pregnancy and community-level factors.

Here, the study rejects the null hypothesis

CHAPTER FIVE

DISCUSSION

This study has addressed three specific objectives which include: to examine the levels of unplanned pregnancy and ascertain the factors associated with unplanned pregnancy; to identify the community factors associated with unplanned pregnancy; and to determine the extent to which contextual factors account for regional variations in unplanned pregnancy in Ethiopia. The purpose of this chapter therefore is to present discussion on the findings of this study.

The data analyzed in this study is representative of the Ethiopian population which also included those of all regions in this country, coupled with rural and urban representations. In this current study, 32% of pregnancies were unplanned. The levels of unplanned pregnancies have continued to fluctuate when compared to other recent studies (Habte, et al., 2013; Wado, et al., 2013; Hamdela, et al., 2012); unplanned pregnancy was observed to be 34% in Hossana town, southern part of Ethiopia (Hamdela, et al., 2012), 36.5% in Oromia region in Ethiopia (Teshome, et al., 2014), 33.3% in Harar (Hamdela, et al., 2012) and a national figure of 35% according to the EDHS in 2011 (Ethiopia Central Statistical Agency & ICF International, 2012).

The rates of unplanned pregnancy computed in this study revealed slight differences in the extent of unplanned pregnancies across regions which therefore calls for targeted intervention programs based on the enormity of the problem of unplanned pregnancy. Previous studies have proven that some countries in Africa are making satisfactory progress towards reducing the incidence of unplanned pregnancy and therefore improving maternal health status (Bankole, et al., 2014; Hubacher, et al., 2008; Mbizvo, et al., 1997); while this progress has not been evident in

Ethiopia. These findings suggest that a lot still needs to be done by the Ethiopian government if an substantial decline in the level of unplanned pregnancy is to be attained in Ethiopia.

The results from the univariate analysis carried out indicates that the level of unplanned pregnancy was highest among women aged 25-29. Another study in Ahwaz city, Iran also established association between age and unplanned pregnancy with women aged 24 to 28 accounting for the highest level of unplanned pregnancy (Najafian, et al., 2011). A study conducted in Senegal, on the other hand, discovered that women less than 25 years experience unplanned pregnancy the most. This study showed that women who are currently married, employed and with no education were more prone to experience unplanned pregnancy in Ethiopia in 2011; confirmed in another study conducted in Ethiopia (Gebreselassie, et al., 2010); but in Kenya, it was observed that women who has never married, are unemployed and with education were more prone to experiencing unplanned pregnancy (Obare, et al., 2012). The number of surviving children of a woman also show a very strong association with unplanned pregnancy; this was also observed in a study conducted in the southwestern part of Ethiopia (Hamdela, et al., 2012) and in Iran (Najafian, et al., 2011).

Bivariate analysis results revealed the association between unplanned pregnancy and marital status, occupation, number of surviving children, religion, household wealth index, household or family size, marriage type, use of contraception, knowledge of contraception, region of residence, community poverty, community family planning services, community female employment and community level of female education.

As revealed from this study that the knowledge of contraception does not seem to guarantee the use of any of these contraceptive methods but there is a strong association between unplanned

pregnancy and contraceptive knowledge and use; previous studies have also established this discrepancy and associations (Habte, et al., 2013; Hamdela, et al., 2012). This study helps to recognize that appropriate counselling on contraceptive methods and their effective use are very important in avoiding unplanned pregnancy rather than just having the awareness of these methods. Marital status shows a strong association with unplanned pregnancy as also seen from previous studies (Geda & Lako, 2012; Hamdela, et al., 2012; Adhikari, et al., 2009; Schwarz, et al., 2008). Women who are currently in a union have been observed to be more exposed to experiencing unplanned pregnancy, this maybe due to low bargaining power in the use of contraception by women with their husbands; most of these women will not initiate contraceptive use without their husband's approval and this is a major deterrent to contraceptive use. It has been realized from literature that Ethiopia have not made much progress in fulfilling the reproductive health right of easy access to safe, effective, affordable and acceptable family planning methods (Habte, et al., 2013). Reproductive health programs are therefore needed to significantly reduce the number of unplanned pregnancy in Ethiopia. This is a way of addressing reproductive rights of both individuals and couples to get access to family planning services and therefore help control the occurrence of unplanned pregnancy.

Communities constitute major determinants of socioeconomic differences in health and health outcomes (Ononokpono, et al., 2013). Thus, communities in which people reside influence not only their health care behavior but also their reproductive behavior Many researchers have often postulated that community contexts influences the attitudes of individuals (Adhikari, et al., 2009; Reynolds, et al., 2006) , but in most cases, this postulation has rarely been examined to determine whether community context can independently influence individual attitudes like unplanned pregnancy after adjusting for individual and household characteristics. The study uses

a nationally representative survey to demonstrate the importance of contextual factors on unplanned pregnancy in Ethiopia. The findings of this study has demonstrated that community contexts are very important characteristics that impact on regional variations in unplanned pregnancy in Ethiopia, the results from this study suggests that there is a need to take the effects of community contexts into consideration if significant improvement is to be achieved on unplanned pregnancy.

Various characteristics of community contexts were found to reveal significant effects on unplanned pregnancy, most importantly region of residence. The findings of this study revealed the significant association of region of residence with unplanned pregnancy in Ethiopia. Comparing, the risks of experiencing unplanned pregnancy in all the regions in this country, the Southern and Western parts of this country are two regions with the highest risks of unplanned pregnancy with Oromiya, Snnp, Benishangul-gumuz and Gambela in these regions. A possible explanation for this can be attributed to low Maternal and Newborn Health (MNH) services in these areas, which reduces information on reproductive and sexual choices (Federal Minsitry of Health Ethiopia, 2013). Efforts are been made at district-level health systems, for continuous quality improvement just to strengthen these services. This study will also aid to identify the best MNH services that can be used across regions in Ethiopia.

With the addition of region of residence covariate into the multilevel model, the results revealed that unplanned pregnancy was significantly associated with region of residence in Ethiopia in 2011; the associated measures of variations propose that significant variations in unplanned pregnancy between and across communities could be partially explained by region of residence as also observed in a study in Ethiopia (Habte, et al., 2013). These findings can be ascribed to spatial inequality in social and economic development between and regions (Habte, et al., 2013).

Furthermore, employment status at the individual level was shown to be an important predictor of unplanned pregnancy. At the contextual level, community female employment was found to also be an important predictor of unplanned pregnancy. The findings of this study indicated lower risks of unplanned pregnancy for women resident in communities with many employed women. Women with no form of employment in this community appear to benefit from the social capital contexts provided by the employment status of the other women within that same community. A plausible explanation for this is the fact that the behaviors and practices that go with been employed which could have positive influences on exposure to unplanned pregnancy can be learnt by unemployed women who resides in a community with predominantly employed women.

In addition, this study established that healthcare services, most importantly family planning services, are another important predictor of unplanned pregnancy in Ethiopia. The study found that living in communities with high percentage of family planning services lowers the risks if unplanned pregnancy. Therefore, it is important give priority to maximum availability of family planning services to all regions in this country.

The socioeconomic context of communities in this country is another important predictor of the risks of experiencing unplanned pregnancy. Poverty concentration was recognized to significantly increase the experience of unplanned pregnancy. Ethiopia's economy is highly vulnerable to exogenous shocks by virtue of its dependence on primary commodities and rain fed agriculture (Ethiopia Central Statistical Agency & ICF International, 2012). This country has continued to experienced major exogenous shocks during the past five to seven years, which includes: notably droughts and adverse terms of trade.

Ethiopia's recent growth has been accompanied by mounting macroeconomic pressures. The country has had to grapple with the twin macroeconomic challenges of high inflation and low international reserves. The difficult macroeconomic situation Ethiopia faced is also attributable to the structural weaknesses in the economy, including supply-side rigidities. This study has therefore established elevated risks of unplanned pregnancy in poor-socio economic contexts, which might increase the exposure of women to poor pregnancy outcomes especially in cases where pregnancy is not planned or wanted.

Place of residence never showed any statistically significant association with unplanned pregnancy in any of the models. A plausible explanation for this is the fact that contextual characteristics such as community poverty, community family planning services, community female employment and community level of female education could affect the risks of unplanned pregnancy even in socially and economically advantaged areas.

The analysis used in this study suggests that the presence of unobserved heterogeneity as a result of unmeasured factors that were not included in the analysis used in this study which might also account for variations in unplanned pregnancy across communities and regions of residence in Ethiopia. This implies that the variations in unplanned pregnancy in this country are not only due to individual-level, household-level and community-level factors measured in this study, but also due to other unmeasured characteristics.

The findings of this study showed that the characteristics of community contexts are vital factors that influence regional variations in unplanned pregnancy. This study discovered that the variations in unplanned pregnancy across the regions and communities in this country were jointly determined by the observed individual-level, household-level, and community-level as

well as by unobserved effects at various levels. This study also unveiled that the measures of variations, expressed as intra-cluster correlation, were significantly large enough to influence variations in the risks of experiencing unplanned pregnancy in Ethiopia as a whole.

Thus, the need to take the influence of community contexts into consideration is very crucial if enough progress is to be achieved in reducing the risks of experiencing unplanned pregnancy.

CHAPTER SIX

6.0 CONCLUSION AND RECOMMENDATION

This study was set to examine the levels of unplanned pregnancy and ascertain the factors associated with unplanned pregnancy; to identify the community factors associated with unplanned pregnancy; and to determine the extent to which contextual factors account for variations in unplanned pregnancy in Ethiopia.

The study found that 32% of women in Ethiopia in 2011 experienced unplanned pregnancy. The rates of unplanned pregnancy significantly associated with marital status, occupation, number of surviving children, religion, wealth index, family size, marriage type, contraceptive use, contraceptive knowledge, region, community poverty, community family planning services, community female employment and community female level of education.

The findings of this study have demonstrated that community-level characteristics play a crucial role in the risk of experiencing unplanned pregnancy. The results from this study, however, have provided an important step toward understanding the numerous ways in which the health in which the health decisions made by individuals are influenced by the characteristics of the communities and regions they live

The time has therefore come to address the issues of unplanned pregnancies, its effects and consequences, not as a family planning problem but also as a reproductive health issue; which can be linked to the socioeconomic status of the women involved, their level of poverty and the health of the immediate family members. Reproductive health, defined as the state of complete physical, mental and social well-being and not merely by the absence of disease or infirmity, in

all matters relating to the reproductive system and its functions and its processes (Singh, et al., 2012); shows that unplanned pregnancy cannot be totally eliminated just by providing contraceptives. Ensuring access to family planning services, encouraging the usage of the most reliable methods of contraception is very essential in preventing unplanned pregnancy. The proposed solutions to the problems of unplanned pregnancy therefore will only be resolved by the commitment of health care providers, government, policy makers, community heads and the individuals in communities to make the health of women a priority.

Based on the findings of this study, it is recommended that the Ethiopian government should plan on the prevention of unplanned pregnancy which was not included in the national reproductive health strategy. Government should work with the community elders, *Idirs*, women and child affairs offices in various regions and influential persons in Ethiopian communities to decrease rumors and misconceptions related to family planning. Health workers should improve the mode of provision of information and counselling methods of contraception in order to give individuals the ability to make informed choice and correctly use family planning methods. The women and child affairs offices in various Ethiopian regions should also work on the empowerment of women in their communities which would help increase women negotiation to use contraception and help foster equity. International donors also need to increase their efforts to ensure a reduction in unplanned pregnancy and thereby improving the health status of both mother and child.

This study further recommends that large scale studies especially qualitative studies considering service providers and health workers should be conducted in order to help understand the risk of unplanned pregnancy Ethiopia. Attempts should also be made to bring changes in the integration

of basic and reduction of unplanned pregnancy by conducting further studies which will be community-designed.

REFERENCES

Adhikari, R., Soonthorndhada, K. & Prasartkul, P., 2009. Determinants of Unintended Pregnancy Among Currently Pregnant Married Women in Nepal. *BMC International Health and Human Rights,* 9(17), pp. 1-10.

Antai, D., 2011. Inequalities in Under-5 Mortality in Nigeria: Do Ethnicity and Socioeconomic Position Matter?. *Journal of Epidemiology,* Volume 21, pp. 13-20.

Babalola, S. & Fatusi, A., 2009. Determinants of Use of Maternal Health Services in Nigeria - Looking Beyond Individuals and Household Factors. *BMC Pregnancy and Childbirth,* 9(43), pp. 1471-2393.

Bankole, A. et al., 2014. Differences in Unintended Pregnancy, Contraceptive Use and Abortion by HIV Status Among Women In Nigeria and Zambia. *International Perspectives on Sexual and Reproductive Health,* Volume 40, pp. 28-38.

Barrett, G. & Wellings, K., 2002. What is a 'Planned' Pregnancy? Empirical Data From a British Study. *Social Science and Medicine,* Volume 55, pp. 545-557.

Boco, A., 2010. *Individual and Community Level Effects on Child Mortality: An Analysis of 28 Demographic and Health Surveys in Sub-Saharan Africa*, Calverton, Maryland, USA: DHS Working Papers.

Bronfenbrenner, U. & Morris, P. A., 1998. The Ecologyof Development Process. In: *Handbook of Child Psychology.* New York: Wiley, pp. 992-1028.

CIA-World-Factbook, 2013. *Ethiopia Demographics Profile,* s.l.: s.n.

Ethiopia Central Statistical Agency & ICF International, 2012. *Ethiopian Demographic and Health Survey,* Addis Ababa, Ethiopia and Calverton, Maryland, USA.: Central Statistical Agency and ICF International.

Faye, C. M. et al., 2013. Unintended Pregnancy: Magnitude and Correlates in Six Urban Sites in Senegal. *Reproductive Health,* 10(59), pp. 1-10.

Federal Minsitry of Health Ethiopia, 2013. *Ethiopia- Maternal Health Brief,* s.l.: FMOH Ethiopia.

Gebreselassie, H. et al., 2010. Caring for Women with Abortion Complications in Ethiopia: National Estimates and Future Implications. *International Perspectives on Sexual and Reproductive Health,* 36(1), pp. 6-15.

Geda, N. R. & Lako, T. K., 2012. Unintended Pregnancy Among Married Women in Damot Gale District, Southern Ethiopia: Examining the Prevalence and Risk Factors. *African Population Studies,* 26(1), pp. 96-112.

Gelman, A., 2006. Multilevel (Hierarchical) Modeling: What it can do and cannot do. *Technometrics,* 48(3), pp. 432-435.

Goldstein, H., Browne, W. & Rasbash, J., 2002. Partitioning Variation in Multilevel Models. *Understand Statist,* Volume 1, pp. 223-231.

Griffiths, P., Madise, N., Whitworth, A. & Matthews, Z., 2004. A Tale of Two Continents: A Multilevel Comparison of the Determinants of Child Nutritional Status from Selected African and Indian Regions. *Health and Place,* Volume 10, pp. 183-199.

Guo, G. & Zhao, H., 2000. Multilevel Modeling for Binary Data. *Annuak Review of Sociology*, Volume 26, pp. 441-462.

Habte, D., Teklu, S., Melese, T. & Magafu, M. G., 2013. Correlates of Unintended Pregnancy in Ethiopia: Results from a National Survey. *Plos One* , 8(12).

Hamdela, B., G/mariam, A. & Tilahun, T., 2012. Unwanted Pregnancy and Associated Factors among Pregnant Married Women in Hosanna Town, Southern Ethiopia. *Plos ONE,* 7(6), pp. 1-4.

Hubacher, D., Mavranezouli, I. & McGinn, E., 2008. Unintended Pregnancy in sub-Saharan Africa: Magnitude of the Problem and Potential Role of Contraceptive Implants to Alleviate it. *Contraception,* Volume 78, pp. 73-78.

Kirchgaessner, C., n.d. *Sharing Responsibility: Women, Society and Abortion Worldwide,* New York: The Alan Guttmacher Instiute.

Krishnan, V., 2010. *Early Child Development: A Conceptual Model.* New Zealand, Early Child Development Mapping Project, Alberta (ECMap).

Kuroki, L. M. et al., 2008. Is a previous unplanned pregnancy a risk factor for a subsequent unplanned pregnancy?. *Am J Obstet Gynecol,* pp. 199:517.e1-517.e7.

Mbizvo, M. T. et al., 1997. Unplanned Pregnancies in Harare: What are the Social and Sexual Determinants. *Social Science Medicine, Volume 45,* pp. 6:937-942.

McCarthy, J. & Maine, D., 1992. A Framework for Analyzing Determinants of Maternal Mortality. *Studies in Family Planning,* 23(1), pp. 23-33.

McCoy, S. I. et al., 2013. Oral and Injectable Contraception Use and Risk of HIV Acquisition among Women in sub-Saharan Africa. *Wolters Kluwer Health,* Volume 27, p. 1001–1009.

Mekbib, T., G/Hiwot, Y. & Fantahun, M., 2007. Survey of Unsafe Abortion in Selected Health Facilities in Ethiopia. *Ethiopian Journal of Reproductive Health,* 1(1), pp. 28-43.

Merlo, J. et al., 2006. A Brief Conceptual Tutorial of Multilevel Analysis n Social Epidemiology: Using Measures of Clustering in Multilevel Logistic Regression to Investigate Contextual Phenomena. *Journal of Epidemiology of Community Health,* Volume 60, pp. 290-297.

Merlo, J. et al., 2005. A Brief Conceptual Tutorial of Multilevel Analysis in Social Epidemiology: Linking the Statistical Concept of Clustering to the Idea of Contextual Phenomenon. *Journal of Epidemiology and Community Health,* Volume 59, pp. 443-449.

Mojekwu, J. N. & Ibekwe, U., 2012. Maternal Mortality in Nigeria: Examination of Intervention Methods. *International Journal of Humanities and Social Science,* 2(20), pp. 135-149.

Najafian, M., Karami, K. B., Cheraghi, M. & Jafari, R. M., 2011. Prevalence of and Some Factors Relating with Unwanted Pregnancy, in Ahwaz City, Iran, 2010. *International Scholarly Research Network (ISRN) Obstetrics and Gynecology,* pp. 1-4.

Obare, F., Van Der Kwaak, A. & Birungi, H., 2012. Factors Associated with Unintended Pregnancy, Poor Birth Outcomes and Post-partum Contraceptive use Among HIV-Positive Female Adolescents in Kenya. *BMC Women's Health,* 12(34), pp. 1472-6874.

Okolocha, C. et al., 1998. Socio-cultural Factors in Maternal Morbidity and Mortality: A Study of a Semi-Urban Community in Southern Nigeria. *Journal of Epidemiology Community Health,* pp. 52: 293 - 297.

Ononokpono, D. N., Odimegwu, C. O., Imasiku, E. & Adedini, S., 2013. Contextual Determinants of Maternal Health Care Services Utilization in Nigeria. *Women and Health,* pp. 53: 647-668.

Ononokpono, D., Odimegwu, C., Imasiku, E. & Adedini, S., 2013. Does it Really Matter Where Women Live?A Multilevel Analysis of the Determinants of Postnatal Care in Nigeria. *Maternal and Child Health Journal.*

Reynolds, H. W., Wong, E. L. & Tucker, H., 2006. Adolescents' Use of Maternal and Child Health Services in Developing Countries. *International Family Planning Perspectives,* 32(1), pp. 6-16.

Schwarz, E. B. et al., 2008. Measuring the Effects of Unintended Pregnancy on Women's Quality of Life. *Contraception,* Volume 78, pp. 204-210.

Senbeto, E., Alene, G. D., Abesno, N. & Yeneneh, H., 2005. Prevalence and Associated Risk Factors of Induced Abortion in Northwest Ethiopia. *Ethiopia Journal of Health and Development,* 19(1), pp. 37-44.

Shokravi, A. F. & Chapman, P. H., 2004. A Study on the Effective Factors of Unwanted Pregnancies in Pregnant Women of Tehran City. *Journal of Reproduction and Infertility,* 5(3).

Singh et al., 2009. *Adding it up: The Costs and Benefits of Investing in Family Planning and Maternal and Newborn Health,* New York: Guttmacher Institute and United Nations Population Fund.

Singh, S. et al., 2010. The Estimated Incidence of Induced Abortion in Ethiopia. *International Perspectives on Sexual and Reproductive Health* , 36(1), pp. 16-25.

Singh, S., Sedgh, G., Hussain, R. & Eilers, M., 2012. Incidence of Unintended Pregnancies Worldwide in 2012 and Trends Since 1995. *Studying Family Planning,* 4(41), pp. 241-250.

Teshome, F. T., Hailu, A. G. & Teklehaymanot, A. N., 2014. Prevalence of Unintended Pregnancy and Associated Factors Among Married Women in Ganji Woreda, West Wollega Oromia Region, Ethiopia. *Science Journal of Public Health,* 2(2), pp. 92-101.

Trujillo, J. C., Carrillo, B. & Iglesias, W. J., 2013. Relationship Between Professional Antenatal Care and Facility Delivery: An Assessment of Colombia. *Health Policy and Planning,* pp. 1-7.

Uthman, O. & Kongnyuy, E., 2008. A Multilevel Analysis of Effect of Neighbourhood and Individual Wealth Status on Sexual Behavior among Women: Evidence from Nigeria 2003 Demographic and Health Survey.. *BMC International Health and Human Rights,* p. 8.

Vu, L., 2005. *Multilevel Determinants of Children's Health Outcomes,* s.l.: University of Saskatoon.

Wado, Y. D., Afework, M. F. & Hindin, M. J., 2013. Unintended Pregnancies and the Use of Maternal Health Services in Southwestern Ethiopia. *BMC International Health anf Human Rights,* 13(36).

WHO, 2011. *Unsafe Abortion: Global and Regional estimates of the Incidence of Unsafe Abortion and Assocated Mortality in 2008 Sixth Edition*, s.l.: World Health Organization.

Worku, S. & Fantahun, M., 2006. Unintended Pregnancy and Induced Abortion in a town with Accessible Family Planning Services: The case of Harar in Eastern Ethiopia. *Ethiopia Journal of Health and Development*, pp. 79-83.

World Bank, 2013. *Trends in Maternal Mortality: 1990-2010. Estimates Developed by WHO, UNICEF, UNFPA and The World Bank*, s.l.: World Bank.

World Health Organization, 2014. *Maternal Mortality Rates*, s.l.: CIA World Factbook.