

UNIVERSITY OF GHANA

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**DELAYED MARRIAGE AND FERTILITY TRANSITION IN
GHANA**

BY

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ACCEPTANCE

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DECLARATION

I hereby declare that except for reference to other people's work, which have been duly acknowledged, this is the result of my own research and it has neither in part nor in whole been presented for another degree.

Michael Larbi Odame

Date

ABSTRACT

Stalls in fertility transition have been observed in many Sub-Saharan African (SSA) countries, including Ghana. This stalling fertility, defies the Demographic Transition Theory and has attracted research attention. Current studies seeking to unravel the causes of the stalling fertility have been inconclusive. Changes in the timing and prevalence of marriage are areas that call for attention because total fertility rate is a function of the age composition of the proportion ever married and never married as well as the fertility of the ever married and never married women. Therefore, a slight change in any of the components will most likely affect the total fertility rate. Ghana has been identified as a country with a relatively rapid decline in the proportion of women in marriage but there is a limited understanding of how this changing trend has influenced the country's fertility transition. This study attempts to examine how the changes in the prevalence of marriage are influencing Ghana's fertility transition from 1988 to 2014. The study used data from the six rounds of the Ghana Demographic and Health Surveys conducted from 1988 to 2014. Descriptive statistics were used to describe the changes in the prevalence of marriage. The Singulate Mean Age at Marriage was further used to measure the average number of years spent in the single state by those who eventually marry. Fertility rates for the ever married as well as the never married were computed and analyzed for trends. Consequently, the change in TFR between 1988 and 2014 was decomposed into four components to identify their relative contribution to the overall change in TFR. Results show a decline in the prevalence of marriage as well as delays in the timing of first marriages. These changes were influenced by the changes in the socio-demographic conditions in the country such as; increased access to formal education, growth in urbanization as well as increased tolerance for premarital childbearing. The total fertility rate declined from 6.4 in 1988 to 4.2 in 2014. The pace of the decline was, however, most rapid from 1988 to 1998 and stalled to a rate of about 4 from 2003 to 2014. Changes in TFR varied by marital status with a decline observed for the ever married. This is occurring alongside the recent increases in the fertility of the never married women. Evidently, changes in the socio-demographic conditions of women were prominent in the changes in the marital and never married fertility. The decline in TFR of 2.21 between 1988 and 2014 was accounted for largely by changes in the age composition of the ever married women. This was, however, attenuated by a slight increase in the TFR resulting from changes in the age composition of the never married women. The study concludes that changes in the proportions of ever married women at various ages made greater contributions to the declining fertility in Ghana than changes in marital fertility. That notwithstanding, the increasing proportion of never married women and the increase in never married fertility offset the pace of fertility decline in Ghana. The increasing proportion of the never married, emanating from delayed marriages, could be a threat to any effort to reduce fertility in Ghana. Therefore, it is recommended that the Government of Ghana, through the Ministry of Education and its agencies, intensify the implementation of policies that seek to expand access to formal education for all females. This will keep more girls in school for longer periods and eventually delay the timing of marriage and parenthood.

DEDICATION

To my wife, Mrs. Gifty Darkoa Larbi-Odame

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TABLE OF CONTENTS

ACCEPTANCE	i
DECLARATION	ii
ABSTRACT.....	iii
DEDICATION.....	iv
ACKNOWLEDGEMENT	v
TABLE OF CONTENTS.....	vi
LIST OF FIGURES	x
LIST OF TABLES	xi
LIST OF ABBREVIATIONS.....	xiii
CHAPTER ONE	1
INTRODUCTION	1
1.1 Background to the study.....	1
1.2 Statement of the problem	3
1.3 Research questions	6
1.4 Objectives of the study.....	6
1.5 Rationale of the study.....	6
1.6 Organisation of the study	8
CHAPTER TWO	10
LITERATURE REVIEW AND THEORETICAL FRAMEWORK.....	10
2.1 Introduction.....	10
2.2 Demographic transition in Sub-Saharan Africa (SSA)	10
2.3 Fertility transition in Sub-Saharan Africa (SSA).....	13
2.4 Marriage timing and fertility transition in Sub-Sahara Africa	19
2.5 Timing of first marriages and fertility change	25
2.6 The second demographic transition.....	26
2.7 Frameworks used in the study of marriage and fertility relationships.....	29

2.7.1 Bongaarts' proximate determinants model	29
2.7.2 Decomposition of the components of change in total fertility rate	32
2.7.3 The United Nations framework for the study of first marriage patterns	34
2.8 Conceptual framework hypotheses for the study	40
2.9 Concluding remarks	45
CHAPTER THREE	47
METHODOLOGY	47
3.1 Introduction	47
3.2 Study setting	47
3.3 Sources of data and study population.....	51
3.3.1 Sources of data.....	51
3.3.2 Study Population.....	53
3.4 Data validation	53
3.5. Main variables used in the study	54
3.5.1 The outcome variable	54
3.5.2 Explanatory variables	55
3.6 Data analysis plan.....	56
3.6.1 Methods used in the analysis of timing and prevalence of marriage.....	57
3.6.2 Methods used in the analysis of timing of first marriages.....	57
3.6.3 Singulate mean age at marriage (SMAM).....	58
3.6.4 Methods used in the analysis of prevalence of marriage.....	59
3.7 Methods used in the analysis of fertility levels, trends, differentials and determinants	60
3.7.1 The use of rate ratios for multivariate analyses of fertility.....	61
3.7.2 Multivariate analysis of never married fertility	62
3.8 Methods used for the decomposition analysis.....	63
3.9 Limitations of the study and concluding remarks	69
3.10 Concluding remarks	70

CHAPTER FOUR.....	71
BACKGROUND CHARACTERISTICS AND FERTILITY TRANSITION IN GHANA ...	71
4.1 Introduction	71
4.2 Background characteristics of women of reproductive age in Ghana.....	71
4.3 Fertility transition in Ghana	75
4.3.1 Levels and trends in the quantum of total fertility in Ghana	75
4.3.2 The timing of fertility in Ghana.....	78
4.4 Concluding remarks	80
CHAPTER FIVE	81
NUPTIALITY LEVELS: TRENDS AND PATTERNS IN GHANA.....	81
5.1 Introduction	81
5.2 Marriage prevalence: trends and patterns in Ghana	81
5.3 Proportion and differentials of never married women in Ghana.....	87
5.4 Trends and patterns in the Singulate Mean Age at Marriage.....	93
5.5 Concluding remarks	98
CHAPTER SIX.....	101
CHANGES IN MARITAL FERTILITY IN GHANA	101
6.1 Introduction	101
6.2 Trends and differentials in marital fertility rates.....	101
6.3 Trends and differentials in marital fertility rates by timing of marriage.....	108
6.4 The influence of first marriage timing on marital fertility	111
6.5 Concluding remarks	118
CHAPTER SEVEN	120
LEVELS, TRENDS AND DIFFERENTIALS IN NEVER MARRIED FERTILITY	120
7.1 Introduction	120
7.2 Never married fertility: levels and trends from 1988-2014.....	121
7.3 Differentials in total never married fertility rates.....	123

7.4 Factors associated with child bearing by never married women in Ghana	126
7.5 Concluding remarks	134
CHAPTER EIGHT	137
DECOMPOSITION OF THE CHANGES IN TOTAL FERTILITY RATE IN GHANA ...	137
8.1 Introduction	137
8.2 Components of the change in total fertility rate due to changes in marital structure and marital fertility, Ghana, 1988-2014.....	138
8.3 Components of the changes in the total fertility rate due to marital structure and fertility from 1988-1998, 1998-2008 and 2008-2014	140
8.4 Changes in TFR and the components of change for the period 1988-2014, 1988-1998 and 1998-2014 by level of education	144
8.5 Concluding remarks	147
CHAPTER NINE.....	150
SUMMARY, RECOMMENDATIONS AND CONCLUSIONS.....	150
9.1 Introduction	150
9.2 Summary of findings	150
9.3 Recommendations	153
9.4 Conclusion.....	158
REFERENCES	160
APPENDICES	169

LIST OF FIGURES

Figure 2. 1 The United Nations framework for the study of first marriage patterns	36
Figure 2. 2 Conceptual framework showing the interrelationships between socio-demographic variables, marriage and total fertility	41
Figure 4. 1 Trends in total fertility rate, 1988-2014	76
Figure 4. 2 Age specific fertility rates 1988-2014	77
Figure 5. 1 Proportion of ever married women 1988-2014	82
Figure 5. 2 Percent age-specific distribution of ever married women, 1988-2014.....	83
Figure 5. 3 Percent distribution of never married women 1988-2014.....	89
Figure 5. 4 Age specific proportions of never married women in Ghana 1988-2014	90
Figure 5. 5 Singulate mean age at marriage, 1988-2014	94
Figure 5. 6 Rural-urban variations in SMAM (1988-2014).....	96
Figure 5. 7 Educational levels and SMAM 1988-2014	97
Figure 6. 1 Trends in total marital and total fertility rates	101
Figure 6. 2 Age specific marital fertility rate 1988-2014	102
Figure 6. 3 Mean age at childbearing by ever married women	104
Figure 7. 1 Never marital fertility rates in Ghana, 1988-2014.....	121
Figure 7. 2 Rural urban variations in TNFR	125

LIST OF TABLES

Table 3. 1 Variable description and categories	55
Table 4. 1 Percentage distribution of background characteristics of the respondents	72
Table 4. 2 Percent distribution of total fertility by age group 1988-2014	79
Table 5. 1 Percent distribution of ever married women by socio-demographic characteristics 1988-2014	84
Table 5. 2 Percent distribution of marital status in West Africa.....	88
Table 5. 3 Percent age specific distribution of never married women 1988-2014	89
Table 5. 4 Proportion of never married women by socio-demographic characteristics, 1988- 2014.....	92
Table 5. 5 Trends and differentials in singulate mean age at marriage by selected background variables	95
Table 6. 1 Percent distribution in age to TEMFR.....	103
Table 6.2 Trends and differentials in ever married fertility rates	105
Table 6.4 Total ever marital fertility rates by the timing of first marriages and socio- demographic variables from 1988-2014	109
Table 6.5 Total ever marital fertility rates by the timing of first marriages, educational levels, and contraceptive use from 1988-2014.....	110
Table 6. 3 Timing of first marriages and total ever marital fertility rates 1988-2014	111
Table 6.6 Fertility rates and rate ratios by timing of marriage for the three years preceding the survey, Ghana, 1988-2014 DHS (Model 1)	113
Table 6.7 Fertility rates and rate ratios by timing of marriage, educational level and contraceptive use 1988-2014 DHS (Model 2)	114
Table 6. 8 Total fertility rates and rate ratios by timing of marriages and selected covariates for the three years preceding the survey, Ghana 1988-2014 DHS (model 3).....	115

Table 7. 1 Age specific never marital fertility rates.....	122
Table 7. 2 Percent contribution to TNFR by age	123
Table 7.3 Total never married fertility rates	124
Table 7. 4 Motherhood status of never married women	127
Table 7.5 Binary logistic regression of ever given birth status among never married women of 15-49 years, Ghana-1988-2014.....	129
Table 8.1 Decomposition of the changes in total fertility rate in Ghana from 1988-2014	138
Table 8. 2 Age specific decomposition of the components of change, 1988 - 1998	140
Table 8. 3 Age specific decomposition of the components of change, 1998 - 2008	141
Table 8.4 Decomposition of the changes in total fertility rate in Ghana from 1988-1998, 1998-2008, 2008 to2014	142
Table 8.5 Decomposition of the changes in total fertility rate by level of education, 1988-2014.....	145
Table 8. 6 Decomposition of the changes in total fertility rate by level of education, 1988-1998 (rapid falling period)	145
Table 8.7 Decomposition of the changes in total fertility rate in Ghana by level of education, 1998-2014 (stalling period).....	147

LIST OF ABBREVIATIONS

AFM	Age at First marriage
ASFR	Age Specific Fertility Rate
ASMFR	Age Specific Marital Fertility Rate
ASNFR	Age Specific Never marital Fertility Rate
CEB	Children Ever Born
CI	Confidence Interval
DHS	Demographic and Health Survey
DTM	Demographic Transition Model
FCUBE	Free Compulsory Universal Basic Education
FDT	First Demographic Theory
GDHS	Ghana Demographic and Health Survey
HIV/AIDS	Human-Immuno-Deficiency Virus/Acquired Immune-Deficiency Syndrome
JHS	Junior High School
MAC	Mean Age at Childbearing
MCEB	Mean Children Ever Born
NGO	Non-Governmental Organization
NPC	National Population Council
PD	Proximate Determinant
PHC	Population and Housing Census
RC	Reference Category
SDT	Second Demographic Theory
SMAM	Singulate Mean Age at Marriage
SPSS	Statistical Package for Social Scientists
SSA	Sub-Sahara Africa
STI	Sexually Transmitted Infections
TEMFR	Total Ever Marital Fertility Rate
TFR	Total Fertility Rate
TNFR	Total Never marital Fertility Rate
WRA	Women of Reproductive Age

CHAPTER ONE

INTRODUCTION

1.1 Background to the study

An onset fertility transition, conceptualized as the shift from high fertility to low fertility has been observed and confirmed in many Sub-Saharan African (SSA) countries (Bongaarts, 2017; Bongaarts & Casterline, 2013; Garenne, 2009, 2014). This observation provoked many demographic studies in the sub-region with the expectation that SSA will progress through demographic transitions similar to the other regions of the world (Agyei-Mensah, 2006; Casterline & Agyei-Mensah, 2017; Tabutin & Schoumaker, 2004).

This expectation appear short-lived as the decline in fertility in the 1990s is observed to have been stalling in some of the countries (Ezeh, Mberu, & Emina, 2009; Garenne, 2009, 2011). Stalling fertility declines illustrate a stagnation in the national total fertility between the two (most recent) surveys after an established trend of decline in national fertility (Bongaarts, 2006; Kabagenyi, Reid, Rutaremwa, Atuyambe, & Ntozi, 2015). The stalls were first identified in Kenya and Ghana (Bongaarts, 2006, 2008).

These stalls in fertility in Sub-Saharan Africa, which defy demographic transition theory, puzzle demographers (Bankole & Audam, 2011) and is currently attracting further studies. Current research is now focused on the determinants of this phenomenon of stalling fertility in the demographic transition of SSA (Agyei-Mensah, 2007; Casterline & Agyei-Mensah, 2017; Ezeh et al., 2009; Hertrich, 2017; Singh, Bankole, & Darroch, 2017). Marriage prevalence and timing are areas that call for attention because total fertility rate (TFR) is expressed as a function of proportions married, as well as levels of marital and non-marital fertility (Lindstrom & Woubalem, 2003; Sayi, 2014; Westoff, Blanc, & Nyblade, 1994). Some studies have shown that marriage is a major predictor of fertility (Garenne, 2014; Aryee, 1985).

Globally, the age at which people enter the first union has increased in many regions of the world in recent times (Cherlin, 2014; Muraco & Curran, 2012; Ortega, 2014). For instance, in monitoring the United Nations World Marriage Data (1970-2008) for 217 countries, Ortega (2014) observes that there has been a postponement of marriage at the world level by an average of two years since the 1970s. The postponement is evidenced by the fact that many women are now entering into marital unions at older ages as shown by the increasing proportions of women at each age group remaining unmarried at older ages.

It has further been observed that changes in marriage timing could have significant influences on fertility transitions. There is also evidence to the fact that rising ages at marriage alone contributed to about 42 percent of the fertility decline in Addis Ababa between 1990 and 2000 (Lindstrom & Woubalem, 2003). Another study in Iran also indicates that rising ages at marriage accounted for 15 percent of the fertility decline between 1986 and 1996 and 35 percent between 1996 and 2006 (Abbasi-Shavazi, 2000). In Bangladesh, Nahar and Zahangir (2013) contend that an increase in age at first marriage by one year could result in a delay of age at first birth by 0.728 years and a further 0.196 reduction in children ever born. Changes in the timing of first marriages, therefore, could be investigated in order to appreciate what is influencing the current stalling in fertility in Sub-Saharan Africa. The extent to which the changes in the age compositions of the ever and never married women in Ghana have affected the fertility transition in Ghana will be the focus of this study.

Previous research has described marriage in most Sub-Saharan African societies as early and near-universal (Aryee, 1985; Awusabo-Asare, 1988; Chojnacka, 1995). Nonetheless, it is emerging from current studies that there is a growing trend in delayed transition to first marriages, with early marriage becoming less prevalent in many countries in the sub-region (Garenne, 2004, 2014; Shapiro & Gebreselassie, 2014). This delay is defined by an increasing

proportion of women who are entering into first marriages at older ages as well as a general increase in the proportions of women who are never married.

Shapiro and Gebreselassie (2014) in a study of 26 countries in Africa, using multiple rounds of data from Demographic and Health Surveys (1986-2011), confirm a rising trend toward delays in the onset of first marriages across the sub-region. Findings from their study demonstrate that among women aged 15–19 and 20–24 years, the proportions in union have shown a tendency to decline over time in 23 countries in each age group, while among those aged 25–29 years, there are declines in the proportion in union in 19 countries. Ghana, Namibia, and Rwanda were the only three countries identified with the least proportion of women aged 15-19 (less than 10 percent), 20-24 (less than 50 percent) and 25-29 (less than 85 percent) that were currently married as per the most recent survey. With regard to the pace of decline in marriage, Ghana is identified among the four countries that stand out as having relatively rapid declines in the percentage of young women in unions. The implication is that more people are postponing or delaying the transition to first marriage in Ghana. Although the increase in the ages at which women are marrying is encouraging, there is a limited understanding of how these changing trends in marriage timing are influencing Ghana's fertility transition. The extent to which this increase in age at first marriage has influenced fertility transition needs to be investigated. This study, which seeks to examine the extent to which fertility transition in Ghana could be understood with regard to the changes in the timing of first marriages, is, therefore, relevant.

1.2 Statement of the problem

Various studies have established that the total fertility rate of Ghana has steadily declined over the past 30 years. This decline has been more rapid and substantial when compared to other countries in West Africa (Agyei-Mensah, 2006; Blanc & Grey, 2000).

The factors responsible for the fertility decline have been identified to include variations in contraceptive use, educational attainment and age at marriage (Asamoah, Agardh, & Östergren, 2013; Ghana Statistical Service, 2005, 2013; Nonvignon & Novignon, 2014). An upward trend in modern contraceptive use, for instance, has been observed in the country. Yet, the increase in the contraceptive prevalence rate has not grown to appreciable levels to explain the fertility decline.

Ghana has made significant progress toward socio-economic development through the various structural adjustment programs initiated in the early 1980s. The structural improvements in the economy and particularly in the area of access to education since 1960 has had the effect of keeping more women in school resulting in a possible reduction in the rate of supply of marriageable women to the marriage market. Using school enrolment as an example, 23 percent of the population aged above six years had never attended school, in 2010, compared to 73 percent in 1960. The improvement in school enrolment has been more rapid for women than for men, as high as 83 percent of women never attended school in 1960 compared to the current 28.3 percent (Ghana Statistical Service, 2013).

However, the extent to which these socio-economic developments have interacted to influence marriage timing is not clear. Besides, it is also not clear how marriage, as a proximate determinant, has responded to these changes to influence the observed decline in Ghana's fertility. As Odigmewu (1996) has observed, proximate determinants respond differently to socio-economic changes and that not all proximate factors shift in similar directions of lower fertility in a period of modernization (Odigmewu, 1996, p. 67).

Marriage in Ghana theoretically marks the beginning of family formation as it has become the socially approved means of procreation (Oheneba-Sakyi & Awusabo-Asare, 1999). Thus, a study of the changing levels in, trends in marriage prevalence and the timing of first marriage could be helpful in explaining fertility transition in Ghana. Ghana has been identified among

four countries that stand out as having relatively rapid declines in the percentage of young women in unions (Shapiro & Gebreselassie, 2014). This decline in the proportion of married women is encouraging but there is a limited understanding of how this changing trend is influencing Ghana's fertility transition.

Increasing age at first marriage could contribute to fertility decline by shortening the reproductive lifespan (Heritch, 2017; Jones, 2005). However, in countries low contraceptive, increases in the age at first marriage are more likely to result in an increase in pre-marital fertility which will eventually attenuate the declining effect of delayed marriage on total fertility (Mensch et al., 1999; Garenne, Tollman & Kahn, 2000; Lindstrom & Woubalem, 2003). The extent to which such a proposition is true for Ghana needs to be examined by way of research.

Previous studies on fertility transition in Ghana focused more on the use of the proximate determinants model of fertility, which identifies marriage as one of the key determinants (Bongaarts, 1984). This model, however, focuses more on the currently married, to the neglect of the never married. Meanwhile, current literature points to observations of increasing proportions of never married women, accompanied by some changes in non-marital fertility in Sub-Saharan Africa (Clark, Koski, & Smith-Greenaway, 2017; Ntoimo & Isiugo-Abanihe, 2014; Smith-Greenaway & Clark, 2018). Besides, studies that describe changes in total fertility that result from shifts in marital structure and or to changes in marital and never marital fertility rates and their determinants are rare in Ghana. Hence, a study that seeks to examine the influence of marriage on fertility requires a technique that will incorporate into a summary measure the relative contributions of changes in age-specific proportions of the never married and ever married as well as changes in marital and never married fertility rates. This study is an attempt to address these knowledge gaps.

1.3 Research questions

In light of the statement of the problem, the study attempts to answer the following research questions.

- i. How has the prevalence of marriage changed from 1988 to 2014?
- ii. What are the trends in fertility levels by marital status in Ghana?
- iii. What socio-demographic factors are influencing the changes in the never married fertility rate in Ghana?
- iv. How has the changes in the proportions of never married women and changes in never married fertility influenced fertility transition in Ghana?

1.4 Objectives of the study

The general objective of the study is to examine the influence of the changes in the prevalence and timing of marriage in Ghana's fertility transition during the decades 1980-2000. The specific objectives are to:

- i. describe nuptiality levels, trends, and patterns in Ghana.
- ii. examine the levels, trends, and differentials in marital fertility and never married fertility.
- iii. examine the determinants of marital fertility in Ghana
- iv. describe the socio-demographic determinants of never marital fertility
- v. determine the components of changes in total fertility rate due to changes in marital structure, never married fertility and marital fertility, covering the period, 1988 to 2014.

1.5 Rationale of the study

A study of the emerging phenomenon of delayed transition to first marriage in Ghana and its influence on fertility is timely and necessary for various reasons. As the phenomenon of

delayed marriage for women in Ghana is relatively recent, few studies have been conducted on this issue. This study will fill the gap by focusing on delayed marriages to bring out their contribution to the fertility decline in Ghana.

In terms of research, current studies on fertility transition have focussed more on contraceptive usage and reproductive behavior of women (Westoff, 1994; Cherlin, 2014). Not much has been done in terms of research on the levels, trends, and patterns of delayed marriage as well as its influence on fertility transition. For this reason, it is more difficult to envision policies and programs that seek to increase the age at first marriage. Yet, it has been acknowledged that declines in age at first marriage precede declines in contraceptive uptake in fertility transitions (Westoff, 1994). This study, therefore, is an attempt to fill that gap by stimulating interest in demographic research on the emerging trend of the increasing proportion of never married women.

Furthermore, attempts to unravel the factors driving Ghana's fertility decline focus more on contraceptive use than on issues relating to marriage formation. A substantial body of literature has been published in this regard (Asamoah et al., 2013; Blanc & Grey, 2000; Boadu, 2002; Nonvignon & Novignon, 2014). Meanwhile, there is no empirical evidence to suggest a substantial uptake in contraceptive that will explain fertility of about two births per woman within the decade of 1988 and 1998 (Chuks, 2002). There is now the need to focus more on the other proximate determinants such as marriage timing and its prevalence.

Studies on the fertility of the never married women have been rare in relation to the fertility transition in Ghana. This is notwithstanding the growing evidence of increasing age at first marriage and an increase in the proportion of never married women of reproductive age. It is, therefore, necessary and relevant to examine the extent to which the occurrence of births to never married women can be explained by the changes in the socio-demographic characteristics of women.

Relatively, not much is known about changes in total fertility resulting from the changes in the age composition of the ever married and never married (marital structure), changes in marital fertility and changes in never marital fertility. This study, therefore, provides an attempt to fill that gap in knowledge by seeking to decompose the change in total fertility rate into four components of change: changes in age composition of the proportion ever-married, proportions never married as well as changes due to marital fertility and never married fertility.

This study provides a better understanding of the pace of fertility transition in Ghana between the periods 1988-1998, 1998-2008 and 2008-2014 and its relationship with changes in the prevalence of marriage.

The study is also timely and relevant on account of efforts of the government to reduce STIs/HIV/AIDS in Ghana. Later age at marriage has been linked to the spread of HIV/AIDS and STIs because a longer duration spent between age at first sexual encounter and age at first marriage results in a higher number of pre-marital sexual partners and other risky sexual behaviors (Bongaarts, 2007; Marston et al., 2009).

Most studies on the timing of first marriages have focused on the relationship between marriage and fertility. However, changes in age at first marriage have further consequences for the transformation of family life relationships and life-course perspectives. Hence it is necessary to document the observed changes in the patterns of behavior of women who marry at later ages in order to understand their implications for the socio-economic development of the Ghanaian community.

1.6 Organisation of the study

The study is divided into nine chapters. Chapter one is the introduction which presents the background of the study, the statement of the problem, objectives, and the rationale of the study. Chapter two focuses on the theoretical perspectives, a review of previous studies on

marriage and fertility transition and a description of the conceptual framework for the study. Chapter three gives a brief description of the study setting and describes the research methodology of the study. Chapter four discusses the characteristics of the respondents across the survey years as well as the fertility levels, trends, and patterns. The trends, levels, and patterns in the timing and prevalence of marriage are discussed in chapter five while the changes in ever married fertility are examined in Chapter six. Chapter seven explores the level, trends, and differentials of the never married women and this is followed by an analysis of the decomposition of the component fertility change in chapter eight. Chapter nine presents a summary of the key findings and recommendations for further research.

CHAPTER TWO

LITERATURE REVIEW AND THEORETICAL FRAMEWORK

2.1 Introduction

Globally, populations have undergone transitions with respect to fertility and mortality rates. Fertility transition is, therefore, a part of the wider demographic transition model. This chapter, therefore, provides an overview of previous studies that are relevant to this study as well as a description of conceptual issues that will influence the study. The chapter begins with a description of the demographic transition theory with a focus on Sub-Saharan Africa. An overview of the fertility transition in Africa is then described. The theoretical perspectives on marriage and fertility dynamics that guided the study are subsequently outlined. The final part of the chapter considers the conceptual framework for the study.

2.2 Demographic transition in Sub-Saharan Africa (SSA)

The classical demographic transition theory or the First Demographic Transition (FDT) has been the framework for the study of many demographic events and trends (Cleland, 1987). The study of these trends, even if discussed in the context of the FDT, is done in relation to changing marriage patterns and their influence on marital fertility. This is because most births occurred within marriage and marriage is tightly linked to fertility.

The FDT, however, is helpful in highlighting the fact that reduced demand for children is a basic driving force behind fertility transitions, and that structural changes in societies in general and expansions in access to formal education for females do have an influence on marriage and fertility.

Fertility transition is part of the wider concept of demographic transition that has widely been used in the study of population change. The classical demographic transition model describes how mortality and fertility decline in response to improvements in the socio-economic

conditions in a country. The model postulates that as a country improves in terms of socio-economic development, fertility and mortality will decline from its high and stable levels to low and fluctuating levels. The first demographic transition is assumed to have been driven by two main transitions; mortality transition and fertility transition, with fertility transition being a necessary response to mortality decline (Defo, 2014).

The FDT was initially formulated based on observations from many industrialized countries in Western Europe and North America. A sequence of observed changes in fertility and mortality in relation to improvements in socio-economic development was consequently used to model changes in natural population growth. The FDT, however, has been criticized, mainly because it is more of a descriptive concept. The model describes a study of the historical trends in the population of the western European countries. But then again, it was assumed to be a universal principle that is expected to spread across the populations of middle and low-income countries. Despite these limitations, the Demographic Transition Model (DTM) has been of great importance in the study of population change due to its ability to demonstrate the relationship between population growth and socio-economic development.

The strength of using the DTM was, for some time, weakened by the argument that the experience of the Western World cannot be used for generalizations about other regions like Africa and Asia. Nonetheless, recent studies confirm the applicability of the DTM to Africa. For instance, studies of trends in population changes in developing countries that relied on the demographic transition model have supported the facts that technological advancements, growths in industrialization and urbanization have worked together to explain some demographic transitions in Africa and Asia. Tabutin and Schoumaker (2004), in a study of the Demography of SSA from the 1950s to the 2000s, observed that SSA entered the global process of demographic transition with the earliest decline of mortality in the 1950s and 1960s. This was later followed by an onset of a fertility decline. This, in their opinion, culminated in an

eventful demographic history in the last two millennia for the region (Tabutin, & Schoumaker, 2004).

Accordingly, Tabutin and Schoumaker (2004) recognized that four main patterns of the transition coexist in the sub-region. In using evidence from countries that have been through diverse economic, political and health experiences in the last 20 years, Ghana emerged as a model of the classic pattern of transition. The classic pattern as illustrated by ten other countries is characterized by a steady decline in mortality for the last 50 years, birth rates decreasing for the last 20 years, and population growth, though still rapid, is slowing down. The traditional pattern was illustrated by Mali, where mortality has declined but birth rates are still at very high levels (45 to 50). Whereas the AIDS-perturbed pattern is illustrated by Zimbabwe with its fertility and mortality rate declining normally until about 1990, the process was seriously interrupted by the significant resumption of mortality, sometimes leading to, as mentioned above, a drastic reduction of growth. The war-perturbed model, as illustrated by Liberia, with a resumption of mortality due to the conflicts, also resulted in the impoverishment. In effect, the DTM can be used in the study of Africa's population.

In spite of these observations, Cahu, Fall, and Pongou (2014) indicate that SSA remains as the only region with an incomplete demographic transition. In spite of the significant declines in mortality rates since the 1960s, fertility rates in the sub-region remain very high. This high fertility combines with the declining mortality rate to produce a rapid population growth rate in the region (Bongaarts & Casterline, 2012). Projections are that by 2050, SSA's population would have doubled from its current size of 1.021 billion to at least 2.193 billion (Population Reference Bureau, 2017).

Recent studies, however, indicate that SSA has entered a stage of demographic transition, with the fertility rate declining from about 6.7 in 1970 to 5.1 by 2014. This has influenced population growth to decline from about 2.9 percent per annum in 1985 to 2.7 percent in 2017 (Population

Reference Bureau, 2017; Tabutin & Schoumaker, 2004; Bongaarts & Casterline, 2012). This decline has been influenced by the onset of fertility decline in many countries. For instance, Tabutin & Schoumaker (2004) observed that until 1985 fertility had remained at about 6.7 children per woman before dropping to 6.1 in 1990-1994 and 5.4 in 2000-2004. Bongaarts (2010) and Bongaarts & Casterline (2012) have also observed similar trends.

In all these, West Africa stands out as the last frontier of the demographic transition in the sub-region due to its adherence to stronger institutions that support high fertility alongside weaker family planning programs. The issue of SSA's exceptionalism in relation to its demographic transition has now captured the attention of population scientists, with fertility decline being one area of concern. The fertility rate in SSA, for instance, is the highest in the world. Women, on the average, have 5.2 children with the top ten countries having the highest fertility rates in the world all being located in the sub-region. It is for this reason that current research that focuses on the fertility transitions and their related factors in the sub-region has occupied a central position in African population studies.

2.3 Fertility transition in Sub-Saharan Africa (SSA)

Fertility transition refers to the shift from a high total fertility rate (TFR) to low TFR. Generally, the transition is characterized by a consistent, continuous and irreversible decline in fertility (Hertrich, 2017). An onset of fertility decline in Sub-Saharan Africa (SSA) was first observed in South Africa in the mid-1960s, and later in Botswana, Kenya and Zimbabwe in the mid to late 1980s (Agyei-Mensah, 2006); by the late 1990s, the decline had spread to most parts of the region. The observed decline was initially received with some doubts, as Africa had long been perceived as a continent that is more resistant to fertility change. The decline was, therefore, linked to unreliable methods used to estimate fertility at different times. As a result, Africa's resistance to fertility change became the topic for discussion in the demographic

literature in the 1980s. The doubts were influenced by deep-seated features of African social structures that project pro-natalism and lags in socio-economic developments (Casterline, 2017; Cohen, 1993). That notwithstanding, the decline was confirmed in subsequent studies (Garenne, 2009, 2011).

Previous studies sought to identify and understand the underlying reasons for this decline. Kirk and Pillet (1998), in an assessment of fertility trends in the 1980-1990s, using data from 23 SSA countries, provide evidence of an initial fertility decline in two-thirds of the countries studied. It was observed that the decline was faster in eastern and southern Africa than in western Africa. Kenya, for instance, was noted as the country with the fastest decline, with her reduction of almost three births per woman of reproductive age within a period of 15 years (Kirk & Pillet, 1998). In their estimation, contraceptive use was the major proximate determinant that explained the fertility decline in SSA.

Westoff, Bietsch & Koffman (2013) further investigated the indicators of trends in fertility in 24 SSA countries and also confirmed the decline in fertility for most countries. In the study, they observed that the decline in the total fertility rate was strongly connected to declines in the desired number of children and increases in the use of modern contraception, with age at marriage playing a minor role.

This decline in fertility provoked many demographic studies in the sub-region (Agyei-Mensah, 2006; Bongaarts, 2006, 2010, 2017; Casterline & Agyei-Mensah, 2017; Tabutin & Schoumaker, 2004) with the expectation that SSA will progress through demographic transitions similar to the other regions of the world. This expectation, however, was short-lived as the decline in fertility in the 1990s was observed to be unstable. The early part of the 2000s saw situations of reversals or stalls in fertility decline for some SSA countries (Bongaarts & Casterline, 2013; Garenne, 2009, 2011). Bongaarts (2006) defines stalls in fertility decline as a failure of the national total fertility to decline between the two (most recent) surveys after an

established trend of decline in national fertility. The stalls were first identified in Kenya and Ghana (Bongaarts, 2006; Bongaarts, 2008).

The initial observations were received with mixed reactions as some demographers were in doubt of the preliminary evidence of the stall (Bongaarts, 2008). This, according to Garenne (2008), stems from the lack of routinely collected vital registration data that would provide the leading source of data for the study of fertility transition. It was further speculated that the stalls in most countries were more spurious than real in nature (Schoumaker, 2009) and that birth histories in the data used might have suffered from serious data quality problems, resulting in underestimating recent fertility in many of the surveys (Garenne, 2011; Schoumaker, 2009). That notwithstanding, there has been enough evidence to show that fertility decline has slowed down in many countries in SSA.

For instance, a systematic analysis of fertility trends since 1950 in 30 SSA countries with multiple national population datasets, revealed six cases of stalling fertility i.e. Ghana, Kenya, Madagascar, Nigeria, Rwanda and Tanzania (Garenne, 2009). Stalled fertility in itself has been part of the global demographic transition but the uniqueness of the SSA stall is that the stall is at a higher level of fertility (an average of about four births per woman) when compared to other regions of the world where fertility has stalled to a replacement level.

These stalls in fertility at higher levels in SSA defy the demographic transition theory, puzzles demographers (Bankole & Audam, 2011) and is currently attracting further studies. Current research is now focused on the determinants of this phenomenon of stalling fertility in the demographic transition of SSA (Agyei-Mensah, 2007; Casterline & Agyei-Mensah, 2017; Ezeh et al., 2009; Hertrich, 2017; Singh et al., 2017).

Initial studies sought to understand the underlying factors for the uniquely stalling fertility at higher levels in the region. Studies that emerged were preoccupied with the distinctiveness of

the sub-region's historical trajectory and its influence on fertility (Agyei-Mensah, 2007). Bongaarts (2017) in an attempt to describe Africa's exceptionalism in fertility decline, notes that the fertility transition was in late-onset, earlier than expected, slower in pace and higher than previous transitions in other regions. Fertility transition in Africa was observed to have occurred about two decades later than the other developing countries and was attributed to the slow progress in socio-economic development that retarded fertility decline as per the conventional demographic transition model. The transition, on the other hand, was quite earlier than expected when compared to the lower stage of the sub-regions level of development. This Bongaarts(2017), attributed to the diffusion of ideas about birth control from non-African countries.

The pace of the decline from the maximum fertility to its current levels has been rather slow for most countries in comparison to non-African less developed countries. Considering a 10 percent decline as an indicator of fertility transition, Gerland, Biddlecom and Kantorová (2017) note that it took 7 countries a period of 40 years to achieve transition, and with the current decline rate of 0.2 children per woman, it is projected that it may take a further 25 years to attain a decline of one child per woman in the sub-region. This pace was linked to the slow pace of growth in selected development indicators such as GDP per capita, urbanization and life expectancy which, in effect, suppressed the decline in fertility.

Furthermore, fertility levels, though declining, were observed to be higher at any given level of development when compared to other regions of the world. This was attributed to the traditional pro-natalist, socio-economic and cultural beliefs. To this end, Africa's slow pace of fertility transition could be linked to its low level of development, weak family planning, pro-natalist attitudes and beliefs that resist fertility declines and lags in socio-economic development (Bongaarts, 2017; Garenne, 2009). With regards to urban and rural areas, it has been observed that fertility transition in SSA first manifested in urban areas before being

evident in rural areas. Though declines were observed in both urban and rural areas, the decline was noted to be faster in the former (Shapiro & Gebreselassie, 2013).

Elondou et al. (2017) also attempted to explore the extent to which Africa's transition is different. Their study explained how and why fertility inequality changed during Africa's demographic transition. Expansion of education in countries such as Ghana provided supportive evidence that in the course of fertility transition, fertility inequality rises. In their observation, education played a vital role in Africa's fertility transition. Women with no formal education contributed very little to the divergence in fertility, whilst women with topmost educational levels were the leading group that contributed to fertility decline.

Changes in proximate determinants have been observed to be associated with fertility transition in Africa. Low contraceptive usage and induced abortion (Garenne, 2014; Nonvignon & Novignon, 2014; Singh et al., 2017; Tsui, Brown & Li, 2017; Tutu, 2011) and steady declines in the proportions married (Garenne, 2008) are the most cited factors for the slow pace of decline. For instance, from 2003 to 2014, only 21 percent of women used any method of contraception whilst the proportion of women using modern methods of contraception increased slowly from 12 percent to only 17 percent within the same period. The general abortion rate also declined slightly from 27 percent to only 26 percent between 2003 and 2014 (Gerland et al., 2017). The implications are that higher rates of unexpected pregnancies were most likely to be slowing down the fertility transition in Africa due to the low patronage of contraceptives.

Unexpectedly, Garenne (2008) notes that fertility stalls occurred, despite an increase in contraceptive use in Ghana and Tanzania. The case of Ghana, however, remained puzzling since none of the proximate determinants of fertility that were studied could account for the changes in the trend of fertility (Garenne, 2009). This may suggest that some distal factor(s),

besides proximate determinants, may be more important in affecting the fertility transition in Ghana.

On the contrary, changes in contraceptive use were found to be unconnected to the recent fertility falls and observed stalls in fertility in SSA (Shapiro & Gebreselassie, 2013) but were mostly influenced by improvements in socio-economic conditions, such as women's education; infant and child mortality and growth in GDP. This finding is supportive of the demographic transition model.

Fertility desires and demand for children is yet another factor that has been found to have a potential influence on SSA's fertility declines (Casterline & Agyei-Mensah, 2007). High demand for children is an obstacle to fertility decline. Only a small proportion of women had intentions of stopping childbearing at two children. Most women want four or more. Declines in desired fertility could translate into a decline in fertility, but most women already with four children still yearn for more. They concluded that reducing these desires will only be meaningful if it is accompanied by more effective means of reduction; people should, therefore, be empowered to implement the reduction in the demand for children.

For most of the studies, increased formal education for women emerged as a key factor contributing to fertility decline. Conversely, countries with a relatively high percentage of women with some secondary education were noted to have exhibited large declines than those with lower percentages (Bongaarts, 2010; Shapiro & Gebreselassie, 2013, 2014).

Most of the studies on the determinants of fertility transition in SSA have been carried out at the sub-regional level. However, such studies mask the variations at the national level hence the need to study fertility transition at the national level in order to better understand the fertility influence of subpopulations. Detailed accounts at the national level also confirm the regional studies (Agyei-Mensah, 2007; Kabagenyi, 2015; Eloundou, 2017).

Agyei-Mensah (2007) noted that fertility decline has been more rapid in Ghana and that Ghana emerged as the vanguard of fertility transition in SSA. Reasons identified for the substantial decline in fertility included stability in the age at first marriage, a very small increase in contraceptive usage, out-migration of men in their youthful ages.

Fertility desires emerged as a strong factor, with an observation that the proportion of women who did not want any more children increased from 23 percent in 1988 to 36 percent in 2003. However, the change in 1993 was very low i.e. changed only from 34 percent to 36 percent. There was also not much change in the median age at first marriage and the median age at first birth with regards to the stall. Agyei-Mensah (2007) indicated that it was easier to reduce fertility from 8 to 6 and even down to four. However, a reduction to four will be most difficult as this will make Ghanaian couples anxious and insecure. With regards to the low level of contraceptive use, he suggested that the over-concentration of efforts on the reduction of HIV/AIDS as a reason for the stalled effort at promoting family planning services.

2.4 Marriage timing and fertility transition in Sub-Sahara Africa

The role of marriage in the fertility transition of SSA has received less attention in demographic literature. Few studies have focused on age at marriage (Garenne, 2014; Harwood-Lejeune, 2001; Hertrich, 2017), polygyny-fertility relationships (Henrich, Boyd & Richerson, 2012; Lardoux & Walle, 2003; Timæus & Reynar, 1998), and proportions married (Shapiro & Gebreselassie, 2014), yet many of the studies have examined marriage in the context of the proximate determinants of fertility change.

The role played by changes in nuptiality in the demographic transition of Africa from 1950 – 1985 has been documented (Chojnacka, 1995). The study illustrated the leading role played by marriage as a catalyst for fertility transition in SSA. Shifts towards later age at marriage was observed as a major driver for the onset of demographic transition in Africa. Northern and

Southern African countries experienced the highest increase in age at first marriage than the other parts of the region, whilst the lowest level of age at first marriage was found in Western and Central Africa. Similar patterns were also observed three decades later by Hertrich (2017). The median age at first marriage (MAFM) which was below 18 years about 50 years before now exceeded 25 years for the Southern African countries. There is a growing evidence that delays in the transition to first marriage which is currently almost widespread in SSA as the age at first marriage, and which used to be less than 18 years is no longer in existence in many of the countries (Amoo, 2017; Hertrich, 2017; Koski, Clark, & Nandi, 2017; Shapiro & Gebreselassie, 2014).

The inverse relationship between age at first marriage (AFM) and total fertility rate (TFR) has been illustrated in many of the studies. Countries with higher AFM were observed to have the lowest TFR. This correlation was weaker in the 1980s when the fertility transition had just begun but it has become stronger in recent times (Hertrich, 2017). The implication is that the timing of first marriage has become the catalyst for fertility change in SSA. Age at marriage as a proximate determinant appeared as a key factor for fertility change in a decomposition of the changes in TFR for nine countries in SSA (Harwood-Lejeune, 2001). The study observed that countries like Kenya and Zimbabwe which had a well-established fertility decline had a higher age at first marriage and age of first birth with a small interval between the two. Age at first marriage (AFM), consequently, was observed as the driving forces of fertility decline in seven out of the nine Sub-Sahara African countries, explaining between one-sixth and one-third of the fertility declines among women aged 15 – 39 years.

The relationship between AFM and fertility has not been that consistent in SSA. Women who marry late have been observed to have a higher mean number of children ever born (MCEB), than those who married early. The late catch-up effect that is making up for the lost time before reaching the end of their reproductive period was evident here. To this end, women who marry

late tend to give birth in quick succession so as to make up for the lost years and hence catch-up with their colleagues who had married early (Odimegwu & Zerai, 1996). This catch-up effect of late marriage has also been observed in Ethiopia.

Though education has been found to be negatively associated with a mean number of children ever born and positively associated with AFM, Odimegwu and Zerai (1996) observe that the inverse relationship between education and MCEB is true for a shorter duration of marriages. At longer durations of marriage, the MCEB differences between highly educated women and those without formal education were negligible. Age at marriage, therefore, by itself did not account for much of the differentials in fertility, especially at longer marriage durations. This, in effect, confirms the late catch-up effect.

The decline in fertility according to Westoff (2003) proceeds in two stages: decline in fertility due to increasing age at first marriage on one hand, and adoption of contraceptive and change in fertility within marriage on the other. In this case, countries with higher age at first marriage are most likely to respond best to family planning practices than countries where women marry earlier. Evidence of increasing age at marriage in the sub-region has been documented (Garenne, 2004; Shapiro & Gebreselassie, 2014; Westoff, 2003). If the fertility of women at a particular age is determined by the product of their marital fertility, and the proportion currently married in that age group, then the changes in age at first marriage would most likely affect the age composition of currently married women. The extent to which this change has contributed to the overall changes in Ghana's fertility decline is yet to receive scholarly attention.

Besides age at marriage, the proportion married is yet another nuptiality-related variable that affects fertility levels. Marriage in SSA has been characterized as nearly universal, and every adult female is expected to marry at least once in her reproductive lifespan. Childbearing is an expected role in marriage, hence, a higher proportion of the ever married will signify higher levels of fertility. Shapiro and Gebreselassie (2014), in describing the prevalence of marriage,

note that the lowest proportion of women in union was found in southern Africa, where the lowest TFR was recorded, whilst the Sahelian countries had the highest proportion of currently married women as well as the highest TFR.

However, significant changes are noted to have occurred in the proportion in union. Generally, the proportion of women in union declined with the greatest decline occurring among women aged 15 – 19 years. Ghana emerged as one of the three countries with the most rapid decline of women in union in all three age categories. The study concludes that there is clearly a general trend toward delay in the onset of marriage with early marriage becoming less prevalent.

The influence of changes in union pattern on fertility decline was examined using the Bongaarts proximate determinants of fertility. It is observed that delays the entry into the first marriage were associated with the depression of the index of marriage, hence fertility. It is observed that reductions in the proportions married accounted for about 30 – 40 percent of the declines in the fertility of three countries, namely Ghana, Namibia, and Kenya. To this end, delayed marriage appears to have made an important contribution to fertility decline.

Considerable variations, however, are observed across countries. It is worthy to note too that it is only in Ghana, Namibia, and Kenya that reduction in the proportions married made substantial contributions to fertility decline. This study, however, was at the regional level and therefore masked substantial sub-population variations at the national level. A much more detailed analysis could be done at the national level to examine more of the socio-demographic variables influencing the fertility-nuptiality relationships.

Moreover, the study was restricted to women aged less than 30 years. With the increasing age at first marriage, it is possible that more women aged 30 years and above may have been left out in the study. The study further used the Bongaarts proximate index of marriage which limits the study to only women who are currently married. The fertility experience of the never

married was therefore ignored. Though it is true that marriage is the socially acceptable context for childbearing in SSA, increases in pre-marital fertility have been observed (Garenne, Tollman, Kahn, Collins & Ngwenya, 2001; Hattori & Larsen, 2007; Zwang, 2004). Hence, a much more comprehensive study that seeks to incorporate the never married is required to appreciate the role of the changing marriage patterns on fertility transition.

The review of previous studies so far has indicated that literature on nuptiality and its relationship to fertility have been dominated by studies on the proportion of currently married women and, hence, marital fertility. However, the rising age at first marriage has resulted in a large number of never married women who are most likely to contribute to fertility change. The number of never married is increasing at any given age. Marital fertility has been widely studied in SSA but less has been published about the fertility of the never married (Clark, Koski & Smith-Greenaway, 2017; Mensch, Grant, & Blanc, 2006; Mensch, Singh & Casterline, 2005; Smith-Greenaway & Clark, 2018).

Besides, most of the studies on the influence of marriage timing on fertility assumed age at first marriage to be an important indicator of exposure to the risk of childbearing. Whilst this assumption may hold for countries like Ethiopia, where age at first marriage coincided exactly with age at first sex, there is an indication that sexual debut prior to marriage is negligible (Gurmu & Etana, 2014; Lindstrom & Woubalem 2003; Reda & Lindstrom, 2014). There is a growing body of research findings that shows that childbearing outside marriage is gaining more recognition in many SSA countries. This, in effect, calls for the study of childbearing experiences of the.

The apparent neglect of studies on fertility experiences of never married women has often resulted in an overconcentration of efforts to regulate fertility being targeted at the currently married. Yet studies show that childbearing is occurring among the never married with some of these pregnancies being mistimed and unplanned. For instance, about 25 years ago, out of the

seventeen countries that were studied in SSA, over 20 percent of never married women were found to have given birth in twelve of the countries studied (Westoff, Blanc, & Nyblade, 1994). Yet the extent to which the proportion of the never married has contributed to fertility in recent times is scarcely reported. Meanwhile, targeting young unmarried women for family planning services for a long time has been viewed as politically and socially unacceptable (Westoff, Blanc & Nyblade, 1994). This makes never married women more vulnerable to unplanned pregnancy, sexually transmitted diseases and illegal abortions (Desgrées du Lou, 2000; Guillaume, 2003; Nalwadda, Mirembe, Byamugisha & Faxelid, 2010). A study highlighting the role of women who may have delayed their marriage and their potential influence on Ghana's fertility transition is, therefore, timely and necessary to direct the attention of policymakers to the never married class. To this end, the recent upsurge in the proportion of never married women needs to be studied as this group has potential role to play in the fertility transition of SSA.

Review of literature indicates that some attempt has been made in the study of changes in the timing of marriages and their influence on fertility. Most studies have been cross-national (Hertrich, 2017; Shapiro & Gebreselassie, 2014) than country-specific. Such studies focused more on a limited number of variables to explain marriage and fertility patterns across the many countries studied. The studies were excellent in providing a generalized view of patterns across the continent. They were, however, limited by their inability to highlight detailed variations among sub-population groups within specific countries. Hence, a need for more country-specific studies that will attempt to provide in-depth discussions of the influence of marriage in fertility. Given the varied cultural diversities in the sub-region, the meaning of marriage may also vary across countries. Thus, generalizations may be restricted to the selected countries.

2.5 Timing of first marriages and fertility change

Studies on the timing of first marriages have relied on micro-economic theories that use human behaviour to explain the formation of marriages. The decision to marry or to remain single is therefore linked to the perceived benefit of entering a marital union in relation to perceived cost. Items in the utility function include number of children, prestige/social status attached to marriage, and advantages of the division of labour. Marriage, in this case, will occur if and only if each partner could maximize his or her utility compared to remaining single. The decision is, however, based on the assumption of a free and a rational choice of the individuals involved. However, in SSA, where marriage is the norm, with an intense social pressure on all females to marry, this assumption may not hold.

Marriage is a requirement in all traditional societies, hence a choice to remain single may be perceived as a deviant behaviour. The universality of marriage, as a characteristic of marriage behaviour, has widely been acknowledged in SSA.

Nevertheless, the economic theories explain the recent delays in marriage timing as well as declines in marriage. For instance, Becker (1974) argues that the gains from marriage is reduced by an increase in the earnings and labour participation of women. From this perspective, the recent upsurge in the proportion of women seeking formal education as a means of obtaining access to the labour market could account for the recent delayed transition to marriage in SSA. There is a growing evidence that first marriages are now delayed in SSA, whilst the proportion of never married is also increasing. This change in marital pattern has widely been attributed to the increasing formal education for women, rapid urbanisation, and more economic opportunities for women outside of marriage (Garenne, 2004).

Delays in the timing of marriages could also be explained by the framework by Dixon (1971) that equates social structure to patterns of marriage. Dixon isolated three variables to explain the variations in marriage timing across cultures:

- a) Availability of marriage partners at the time the decision to marry is made as determined by the age-sex ratio of marriageable population. In this case, an imbalance created by shortage of men, perhaps from high rate of out-migration could increase the marital age for females. Imbalances could also occur with very high proportion of educated women who may be unwilling to marry men of lower educational level.
- b) Feasibility of marriage as shown by the financial and social conditions needed to establish a household. With this, potential spouses may delay marriage and parenthood in order to plan and prepare themselves for better and higher standard of living before marriage.
- c) Desirability of marriage relates more to pressure from society, and the individual motivation to marry. The desire to marry would be higher in societies in which children grow in households where mothers marry young.

2.6 The second demographic transition

The Second Demographic Transition (SDT) was jointly proposed by Ron Lesthaeghe and Dirk van de Kaa in 1986 to describe the complex interrelationships that exist between fertility, family formation, and partnership behavior. The SDT is believed to have emerged from the classical FDT. The SDT was believed to have started with three fundamental revolutions:

- a) Contraceptive revolution, which was initiated by the use of very efficient contraceptives which sought to control fertility.
- b) Sexual revolution which resulted in an overall decline in the age at first sex and age at first marriage.
- c) Sex/gender revolution that questioned the existence of the sole breadwinner household and its related gendered division of labor.

These three revolutions interconnected with each other and resulted in an overall decline in fertility through mechanisms such as delayed transitions to first marriages, postponement of childbearing in marriages and childbearing outside marriages.

The Second demographic transition, (Van de Kaa 1987; Lesthaeghe, 2014), therefore, explains how ideational shifts appear to have changed people's attitude towards marriage and childbearing. Prior to the SDT, age at marriage was low, whilst the proportion of married was high. These two phenomena operated alongside lower incidence of cohabitation and very low incidence of non-marital child bearing to confine fertility to the institution of marriage. However, with the onset of SDT, the classical Malthusian 'preventive check' of delayed marriage that acted as a means of population control was weakened, as marriage was gradually disconnected from childbearing.

The second demographic transition is characterized by increases in the following: age at first marriage, proportions never married and proportions in cohabitating relationships. This results in a situation where gradually, long-term cohabitation replaces marriages. The increasing prevalence of cohabitation, coupled with the high incidence of divorce, closely associates with an upsurge in non-marital childbearing. The close linkage of marriage to fertility, which existed during the FDT was, therefore, weakened in the SDT.

Moreover, remarriage after divorce and widowhood, which was done in quick succession during the FDT to ensure continued childbearing, became less important during the SDT. Individualistic ideas that accompany improved socio-economic conditions also facilitated shifts in marriage type from polygyny towards monogamy. Fertility which was characteristically confined to marriage during the FDT shifted as non-marital births became more apparent in the SDT. In effect, more and more women took the decision to postpone childbirth to later ages.

The SDT as per the proponents occurred in the industrialized countries, where fertility is now below replacement level. However, there is a growing evidence that the SDT is now spreading fast to the other regions of the world. For instance, in parts of central and Eastern Europe where late marriage did not exist, SDT is manifesting itself in a new trend towards later marriage (Lesthaeghe, 2014). Similarly, the long held observation of early and universal marriage no longer holds in many SSA countries (Garenne, 2004; Shapiro, 2014). Besides, divorce has been observed to have exceeded widowhood in the dissolution of a marriage. In addition, there are studies that highlight the declining prevalence of polygyny as a marriage type. These are some of the characteristic features of SDT that are being observed in SSA. Accordingly, Fukuda (2016) proposes that an increase in the prevalence of cohabitation and extramarital births should be regarded as one of the significant indicators for a country that has entered the stage of SDT.

The SDT and FDT are both influenced by changes in socio-economic conditions of countries, but the FDT differs with its assumption that mortality is a prerequisite for fertility decline. Proponents of the SDT, however, stress the fact that whilst economic, social and technological changes are important in determining the changes in nuptiality and fertility behaviors, the SDT, however, seems to place much more emphasis on changing the role of ideational factors in moderating fertility changes.

The emphasis on the SDT in a study of the changes in the timing and prevalence of marriage and its link to fertility changes in Ghana, hinges on its ability to explicitly highlight changes in family formations such as delayed marriage, non-marital childbearing and their link to lower fertility. The SDT, in addition, links fertility and nuptiality to structural changes such as increased access to formal education, urbanization, cultural changes in the form of secularization, technology changes, adoption of modern contraceptives etc. (Sobotla, 2008).

The SDT has been criticized because it is typically related to Europe but there is extensive evidence of the spread of the features of its features across many SSA countries.

It is also observed that fewer adults are now marrying than previously. Again, non-marital births are increasingly becoming common and divorce now exceeds widowhood as a cause of union dissolution (Clark & Brauner-Otto, 2015). To this end, Lesthaege (2014) acknowledges that features of SDT are spreading out beyond the European cultural realm. The interest in SDT, for this study, has been influenced by the fact that the SDT makes room for the decoupling of marriage and fertility.

2.7 Frameworks used in the study of marriage and fertility relationships

2.7.1 Bongaarts' proximate determinants model

Bongaarts and Potter (1984) identify the proportion of women married and in sexual unions among a set of variables that interact to determine fertility in a country. The variables, termed proximate determinants of fertility rates, include contraceptive use and effectiveness, induced abortion and postpartum infecundity. The proximate determinants of fertility were described as the biological and behavioral factors through which the background determinant variables such as education and religion affect fertility. The distinguishing feature of a proximate determinant is its direct connection to fertility. The strength of this model lies in its ability to directly relate a proximate determinant to fertility. For instance, if there is a decline in the proportion of currently married women, then fertility would necessarily decrease when the other proximate determinants remain the same. In modifying the model, Bongaarts (2015) proposed the use of the Index of Sexual Exposure as a better indicator of the exposure to the risk of childbearing, rather than the index of marriage. This was expected to capture the fertility of all women, regardless of their marital status, who have had sex in the last month or are pregnant or abstaining postpartum. This modification, if used in the Ghanaian context, may be

challenging since data on sexual activity and its frequency, especially by never married women, may not be reliable. Besides, definition of marital status may be much clearer than of sexual activity. The index of sexual exposure makes it difficult to differentiate fertility of women in different marital statuses. The changes in the age comparison of women ever married or never married call for a much more robust method that can identify the extent of the change in fertility resulting from the proportion married/never-married, marital fertility or never married fertility. This should be of interest for policy makers to identify the target population for family planning programmes.

Besides, the updated proximate determinant model relates fertility change to the pool of women who are sexually exposed, but marriage still play a dominant role in childbearing in Ghana. The direct connection of marriage to fertility change is widely acknowledged. This study seeks to describe the contribution of the changing patterns of marriages on fertility transition in the country and not just changes in sexually active women. Studying the fertility of the never married as well as the ever married will provide an account of the changes in marital structures on Ghana's fertility transition.

An issue of concern that emerged from previous studies on the influence of marriage timing on fertility change is the overreliance on the proximate determinant model (Bongaarts, Frank, & Lesthaeghe, 1984). The model has been applied in several fertility studies based on its strength in specifying a strong relationship between TFR and the proportion married. The proximate determinant model, in effect, provides an opportunity to examine the extent to which changes in the proportion of married women could affect total fertility rate in a country. This model has been used in many studies within countries in Africa (Sibanda, Woubalem, Hogan & Lindstrom, 2003) and outside Africa (Hossain & Karim, 2013; Islam, 2017) to describe how the total fertility has been influenced by the proximate determinants.

Chola and Michelo (2016), in using the framework in an analysis of the proximate determinants of Zambia's fertility with the Zambia Demographic and Health Survey, found marriage to have emerged as the largest fertility inhibiting effect on natural fertility. Marriage, in the study, accounted for 40 percent of the decline in fertility, whilst postpartum infecundability, the second largest factor, accounted for 22 percent, with contraception accounting for only three percent of the decline. Other studies have identified reduced exposure to the risk of childbearing through delayed marriage as the key factor in fertility decline. The study, in most cases, indicates that marital exposure has become a means through which a substantial decline in potential fertility could be achieved, in most cases it could account for about 35 – 40 percent change when compared to contraceptive use (Chola & Michelo, 2016b). Odimegwu & Zerai (1996) identifies delayed marriage to be the principal proximate determinant of fertility in Igbo, accounting for about a 23 percent impact with 18 percent for traditional contraceptives and three percent for modern contraceptives (Odimegwu & Zerai, 1996).

In Ghana, proximate determinants have been extensively used in many fertility studies (Ameyaw, Badasu & Codjoe, 2013; Chuks, 2002; Parr, 1998; Tutu, 2011). Postpartum infecundability has been observed to be a far more dominant inhibiting effect than the other proximate determinants. The study however observed marked weakening in the influence of this variable towards fertility reduction. Whereas PPI reduced fertility by 84 percent in 1988 only, the resulting influence in 1998 was 69 percent, with marriage and contraceptive use showing appreciable increase in their relative contributions toward fertility decline (Chuks, 2002). Similarly, Parr (1998) studied the factors that influenced fertility in Ghana during the early stages of the doctrine from 1988-1993 and Postpartum infecundability was identified as the most important fertility-inhibiting factor was followed by the index of marriage with contraceptive use playing a minor role.

A major shortcoming of the Bongaarts proximate determinants model is acknowledged (Bongaarts, 2015). The model assumes that all childbearing occurs to women who are married or are in some form of consensual union. The model, in effect, ignores childbearing which occurs to the never married women. In the meantime, childbearing outside marriage is gaining recognition. The model, in the light of substantial changes in reproductive behaviour in the recent past, has been fine-tuned to include the index of sexual exposure that will capture unmarried women who are sexually active (Bongaarts, 2015). However, the modified version is not without challenges since it reports of sexual activity by never married women in a country like Ghana, where sexual activity, especially among the unmarried, is shrouded in secrecy, and may be less reliable for the use the tune-up model.

Though the model has since been revised to cater for the observed limitations, it is not clear if sexual exposure is homogeneous for all women, regardless of their marital status. In any case, the use of the tune-up version of the model may confound childbearing experiences of women of different marital status. The socio-economic and demographic outcomes of birth to the never married may be different from that of the ever-married. Hence a need for a much more robust method that will capture and distinguish the contribution of the changes in the proportion never married and their fertility from the ever-married. The use of decomposition techniques of that nature was also observed to be rare in the previous literature on marriage and nuptiality. Considering the increasing pace at which the category of never married women has increased over the past two decades, it will be interesting to find out the extent of their contribution towards the fertility transition.

2.7.2 Decomposition of the components of change in total fertility rate

Decomposition refers to the process of separating a phenomenon, in this case demographic variables, into its basic parts. Decomposition as a technique is based on the principle of

breaking down the changes in the components of population growth (fertility, mortality and migration) over time into two or more components that can be used to describe the contributions of each of the components to the overall change in the variable that is being studied. Decomposition, according to Gupta (1993), deals with finding the additive contributions of the effects of the differences in the compositional or rate factors in two populations to the difference in their overall rates (Gupta, 1993). The technique provides a summary measure that seeks to explore the compositional effects (e.g. marital status and age structure) on an overall change. This, in effect, will help identify the confounding compositional effect. Besides, the different components derived from the decomposition could be used to account for the changes in the demographic phenomena under study.

The use of decomposition in demography can be traced to Kitagawa (1955) who used the components of differences between two rates to explain the differences between the total rates of two groups in terms of the differences in their specific rates and differences in their composition. The technique has since been extended to the study of fertility dynamics as a result of changes in the components attributable to population composition or to group specific rates (Gubhaju, Jongstra & Raikoti, 2014; Lindstrom & Woubalem, 2003; Retherford & Rele, 1989; Shakya & Gubhaju, 2016).

The technique is premised on the fact that a rate can be expressed as the product of several factors. Hence, total fertility rate, for instance, can be expressed as a function of proportions marrying as well as levels of marital and never-marital fertility. Moreover, it has been acknowledged that the fertility of a specific age group is the product of the proportion married at that age and the rate of marital fertility at that age (Westoff et al., 1994 p.27). The implication is that changes in the proportions ever married and/or never married coupled with changes in marital and never marital fertility rates should have some influence on total fertility rate. Therefore, changes in overall fertility can be shown by statistical analysis to be 'compositional'

in the sense that it can be influenced by an increasing proportion of the never married or by the declining proportions of the population of women who are ever-married.

The proximate determinants model, as used in fertility studies, assumes that childbearing occurs mainly within marriage. Hence, the study can only describe the influence of the proportion currently married on marital (and not total) fertility (Harwood-Lejeune, 2001). Meanwhile, the rising age at first marriage with its associated declining proportion of the ever married creates the propensity for changes in the levels of exposure to childbearing outside marriage. Studies have shown that childbearing outside of marriage is gaining recognition in many SSA countries (Meekers, 1994; Bongaarts, 2015), and that women who marry late are exposed to greater risk of pre-marital pregnancy than those who marry early. The implication is that the influence of a rising age at marriage on fertility decline is likely to be weakened by an increasing premarital fertility.

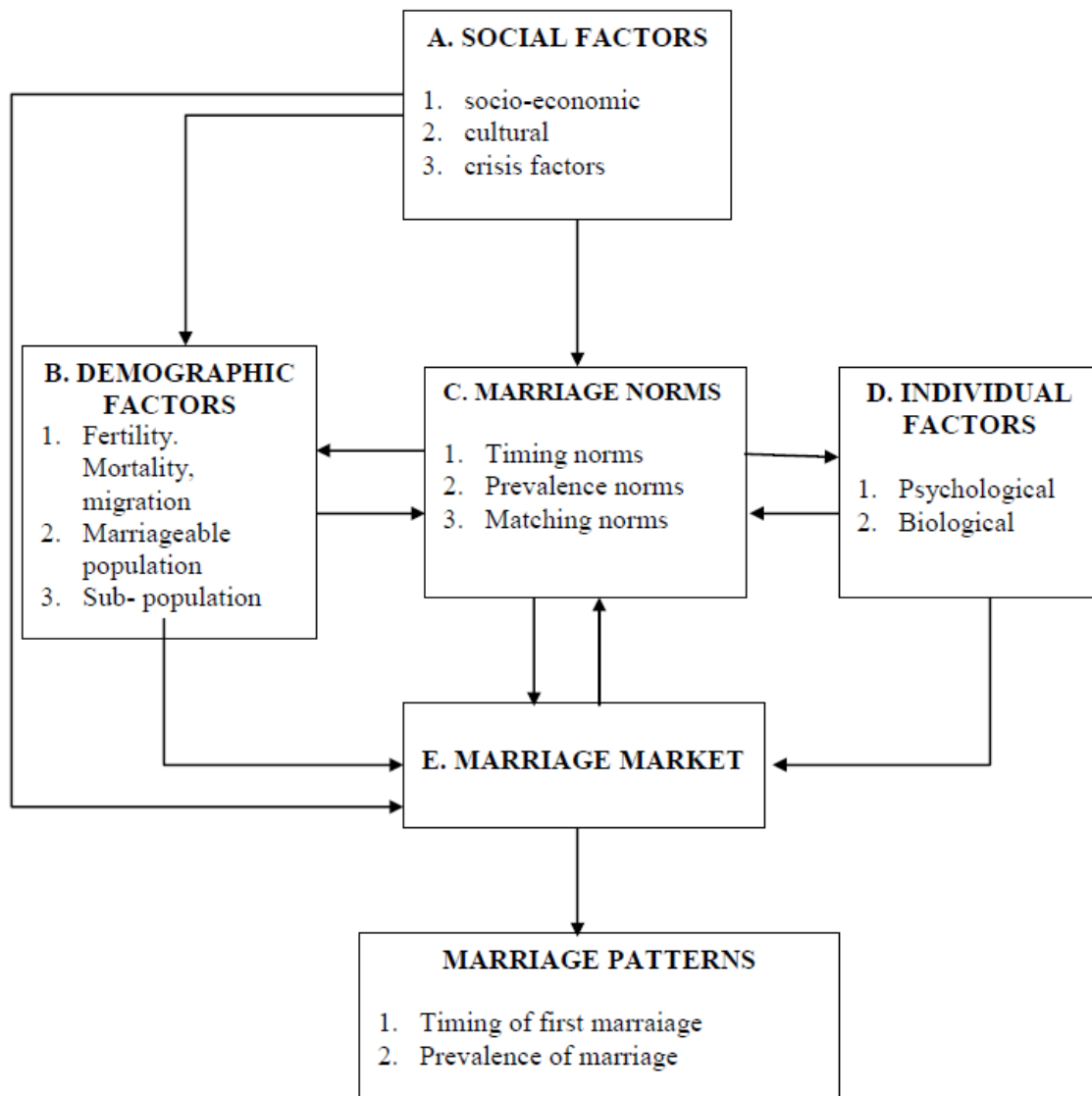
On the contrary, Lindstrom & Woubatem (2003) observe an increase in the proportion of never married women to be associated with a decline, in non-marital fertility; consequently, a change in non-marital fertility was identified as a key component of fertility decline in Addis Ababa. The extent to which the increasing proportion of never married women has contributed to the fertility transition in Ghana also needs further clarification. Hence, in order to contribute to our understanding of the significant role played by changing marriage patterns as a component of fertility change, there is a demand for a research that aims to decompose the changes in fertility rates into changes in proportion married namely, the change in marital fertility rate and change in non-marital fertility rate.

2.7.3 The United Nations framework for the study of first marriage patterns

The complexity of marriage as a phenomenon of study calls for a broader framework in the study of timing and prevalence of marriages. Economic and sociological models have dwelt so

much on isolated variables to describe marriage timings. This, however, has not been sufficient in explaining marriage timing. Therefore, the United Nation (1988) developed a conceptual framework that identified broad concepts from which a more detailed study of marriage timing could be derived. This framework has practical and conceptual advantage over the other models. The variables in the model are not discussed in isolation but in combination with others. Unlike the other Becker and Dixon models, the United Nations (1988) framework is able to combine a chain of social, economic and demographic conditions with societal marriage norms to explain marriage formation. The variables are interconnected to the extent that any change in one of them could affect the others. Figure 2.1 illustrates the framework.

Figure 2. 1 The United Nations framework for the study of first marriage patterns



Source: United Nations (1988), Conceptual Framework, First Marriage Patterns and Determinants, Department of International Economics and Social Affairs, ST/ESA/SGR/R/76, New York.

The Social Structure (Box A) is assumed to directly influence four blocks of intermediate variables to determine marriage formation decisions and stability. The blocks are demographic (B), marriage norms (C), individual motivations (D), and the marriage market (E).

Within the social structure (A), the educational level, especially, of a woman can have a direct relationship with the age at marriage formation. Evidence from the World Fertility Surveys, and Demographic and Health Surveys indicates that educational level, especially of women,

has a direct relationship with age at first marriage. Generally, it is expected that women with higher levels of education would delay their entry into first marriage as a result of the high number of years spent in school. However, variations exist across societies due the complex interconnectedness of education and other variables. Thus, the mechanisms through which education affects the timing of marriages are not fully understood (United Nations, 1988). For instance, the prevailing marriage norms in a society could moderate the association of educational level of women and timing of their first marriages. In societies where parents control the marriage market, they are likely to send their children to school to enhance their chances of acquiring better-educated husbands. The implication is that women with higher levels of education will have preference for partners of commensurate educational levels. This, in effect, would limit the choices of highly educated women to the very few higher educated men in society. More women will therefore be squeezed out of the marriage market.

For socio-economic reasons, some women may perceive career opportunities as an alternative to marriage and are likely to remain unmarried for a longer period. This will also depend on the prevailing social norms on marriage. A strong social pressure may enhance the desire of a woman to enter the marriage market earlier than the job market. This view plays on the assumption that all women are career-centred. In societies where a considerable number of women are 'home-centred' or 'family-centred', the preference to give priority to family life will be higher. Thus, educational level on marriage timing will generally be minimal.

Increased levels of education, on the other hand, usually weaken social norms. Women with higher educational levels may have stronger disapproval of parental involvement in mate selection. Increased education could therefore weaken the traditional system of mate selection through intermediaries like parents and other kinsmen and the family's authority as a matchmaker at the marriage market. To this end, women with higher educational background who are not able to find suitable partners are likely to delay marriage or remain single for life.

Furthermore, higher education could detach marriageable women from their traditional environment. They can, therefore, freely select partners from where they are schooling or working or settled by themselves. Crisis factor in the model refers to sudden unexpected changes in the social life of a person, which can influence one's decision to marry; for example, sudden loss of a supporting parent, natural disasters and wars.

The demographic factor (B) of fertility, mortality and net migration combine to determine the initial population by age and sex. This has a direct effect on the marriageable population, which is defined in the model as the number of men and women eligible for marriage. In some traditional societies, formally married men and women are disqualified in the marriage market, hence a shortage of eligible partners. However, in situations where serial monogamy pertains, it is generally expected for divorcees and widows to remarry within the shortest time; the marriageable population will most likely be higher and will eventually reduce the marriage timing. Men mostly progress from monogamous marriage to reduce the population of marriageable women by concurrently marrying two or more wives. This practice has widely affected prevailing religious beliefs. In general, Christian denominations oppose polygyny whilst it is an acceptable practice in Islam and for the people of the traditional African religious faith. Thus, areas where monogamy is strictly practiced will most likely have higher supply of marriageable women, which may lead to higher ages at first marriage. The marriageable population is also affected by the timing norms – i.e. the ideal and minimum legal marriage age within the society. Any increase in the marriageable age would reduce the supply of candidates to the marriage market. Further studies on this revealed that the increasing shortage of men for women at the prime marriageable age in the United States is related to the declining marital fertility.

The marriage norm (C) explains how the same socio-economic conditions influence marriage patterns differently in separate social contexts. In most societies, it is the marriage norms that

outline the entry, exit and re-entry requirements into the marriage market. The forces of demand and supply at the market however influence these norms depending on the social structure of the group.

Timing of marriages is influenced by the legal age below which marriage is invalid in a country, whilst the ideal age refers to the age at which it is socially appropriate for a man or woman to marry for the first time. The legal age set by government has minimum impact on marriage desirability compared with the ideal age. The ideal age is deeply embedded in the consciousness of a group or society such that unmarried men and women may feel intimidated if they are not married by this age. Marriage timing norms are mostly transmitted through the socialisation functions of the family as well as the teaching of beliefs and customs that act as sources of social rewards and sanctions for early marriages (United Nations, 1988).

Norms on pre-marital sex would also have great influence on marriage patterns. It is assumed in this study that a significant purpose of marriage is to provide a legitimate avenue for sex. Therefore, if it is permissible, or generates little resentment from society, to obtain sex without marriage, then there would be less need for marriage unions. Christian and Islamic beliefs forbid sexual intercourse before marriage. The expectation is that the bride has to be a virgin at the time of first marriage. It is, therefore, expected that women living in areas where there is a greater emphasis on virginity before marriage are more likely to enter marriage unions at an earlier age than those living in areas with liberal attitudes to pre-marital sex. Early marriages have been promoted in traditional societies as a way of avoiding risks associated with pre-marital sexual relations. However, an increasing use of modern and effective contraceptives may be one of the reasons for the delays in the transition to marriages.

The incidence of pre-marital childbearing is yet another normative behaviour that will affect the transition to marriage. The assumption is that marriage legitimizes parenthood and the primary purpose of marriage is to raise children. Again, if there is no stigma attached to pre-

marital pregnancy and childbearing, age at marriage is likely to be high. There are situations where marriages are hastened due to the occurrence of illegitimate conceptions.

The individual motivation factors (D) in the model are mainly psychological and biological traits that influence the likelihood of entering the marriage market. Some of the basic factors are the desire for children, help in old age and the desire to conform to social norms that forbid premarital sex. The biological factor defines mainly the age at puberty. Thus, in societies where premarital sex is frowned upon, exposure to sex actually begins in marriage and not puberty.

The marriage market (E) is an abstract location or platform where men and women who seek to enter a union come together as candidates for marriage. The selection could be a free partner choice or could be facilitated by matchmakers, matchmaking customs, specialized dating systems or special meeting places for bachelors and spinsters. With regard to specialized dating systems, the proliferation and advancement of technology make this possible these days via dating websites, chatrooms and social media platforms.

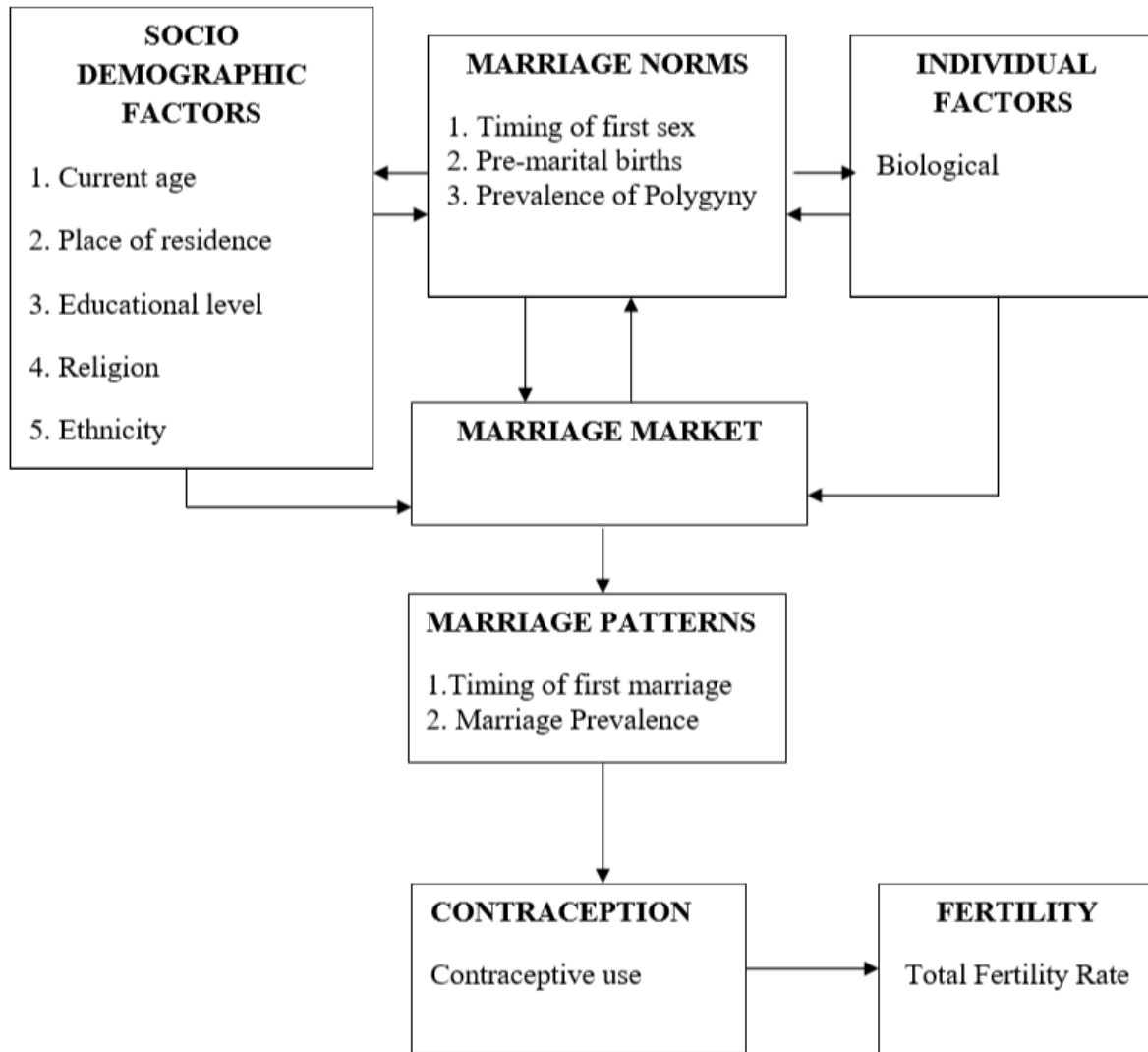
Marriage Formation (F) becomes complete when the union at the marriage market (D) is socially approved and recognised between the partners' commitment to one another with the expectation of a stable, lasting and intimate relationship. It is often marked by dowry payment by the groom or his kin to the family of the bride followed by official handing over of the bride by her family to the groom and a marriage ceremony/celebration that will formally unite the partners (Nunkunya, 1992).

2.8 Conceptual framework hypotheses for the study

Based on the literature and the theoretical perspectives reviewed in the preceding sections of this chapter, a conceptual framework was developed for the study. The framework, illustrated in Figure 2.2, describes the set of interacting variables required for the study of the influence of marriage prevalence and timing on total fertility rate in Ghana. This framework takes into

account demographic, social and behavioral factors. All of these are known to influence the timing of marriage and fertility in developing countries. The variables are interconnected to the extent that any change in one of them would most likely affect the others.

Figure 2. 2 Conceptual framework showing the interrelationships between socio-demographic variables, marriage and total fertility



Source: United Nations (1988), Conceptual Framework, First Marriage Patterns and Determinants, Department of International Economics and Social Affairs, ST/ESA/SGR/R/76, New York. (Modified)

A woman, in this study, is considered married if she is formally married (civil, religious or customary union) or if she is in an informal union (living together/long cohabitation). Marriage in Africa is characterized by several stages, which make its measurement difficult. Therefore, this definition, as used by the DHS for data collected for this study, has been adopted. Further, never married women are defined as women who have never entered into marriage before irrespective of the marriage form, whilst ever married includes currently married and formerly married such as widows and the divorced.

In the framework (Figure 2.2), marriage prevalence and timing of first marriages are presented as the main intermediate variables for the study, and are expected to directly influence contraceptive usage to affect the dependent variable, total fertility rate. Total fertility rate is defined as the average number of children a woman is likely to have if the current age-specific fertility rates remain constant throughout her childbearing years. The TFR is one of the most useful indicators of fertility because it sums up, in a single number, the fertility of all women at a given point in time.

Marriage prevalence, on the other hand, refers to the age composition of the ever married women and never married women in the sample, whilst the timing of marriage refers to the age at which a woman transitions from the never married status to ever-married. This was indirectly obtained through the computation of the Singulate Mean Age at Marriage (SMAM) and age at first marriage as reported by respondents. It was based on these definitions that delayed marriage in this study was conceptualized as the increase in the age at first marriage for ever married women and/or the increase in the proportion of never married women of all reproductive ages. The rationale for choosing the proportion of never married women as an indicator of changes in the timing of marriage is that if this proportion increases over time across different age groups, then, perceptibly, there is a potential increase in the timing of marriages; hence, marriages are being delayed. Correspondingly, if the proportion of ever

married women decreases over time across different age groups, then marriages are being delayed. The timing and prevalence of marriages are conceived to be influenced directly by the control variables: current age, educational level, rural/urban residence, ethnicity, religion, pre-marital childbearing, age at first sex and contraceptive use.

Current age is included as an important demographic variable in order to examine whether or not the influence of the timing and prevalence of marriage on fertility changes over time across the different cohorts of women. It is expected, for instance, that the proportion of never married females currently aged 15 – 19 years will be higher than those aged 30 – 44 years old. The level of educational attainment and place of residence were also included to measure the extent to which modernization of the social structure in Ghana has influenced the marriage-fertility relationships. Educational level of a woman has long been recognized as a factor influencing decisions as to when to marry and the number of children ever produced. In this regard, women with higher levels of education will most likely marry at higher ages but bear fewer children than those without education. This is probably because formal education is expected to keep females in school for longer periods and hence give them a lesser reproductive lifespan. Higher levels of education, therefore, generally lead to lower fertility through delayed age at marriage. In effect, whilst formal education will most likely be negatively correlated to total fertility, its association to marriage timing will be positive. From the conceptual framework, it is very likely that recent improvements in educational levels since 1988 may have accounted for some of the changes in the timing and prevalence of marriages in Ghana. Likewise, increased urbanization could weaken the traditional norms on marriage, detach marriageable women from their traditional environment, where strong social pressure exists to facilitate the desire to marry earlier. Women, living in urban areas were, in effect, expected to delay their first marriage, compared to those living in rural areas. Similarly, stronger pronatalist ideals may exist at the rural areas to promote higher fertility than in the urban areas.

Ethnic and religious diversity is another feature of Ghana's social structure that will most likely affect marriage and fertility patterns in the country. The various religious denominations may have very different doctrines about marriage formation and premarital childbirth. Additionally, marriage in Ghana is guided by customary practices. It was for these reasons that ethnicity and religion were included in the framework. With the current spread of modernization, secularization, and a greater tendency to abandon traditional beliefs, it is more likely that the role being played by ethnicity and religion in marriage timing and fertility may not be very significant in recent times. Ethnicity has been found to be more important than socio-economic factors such as the source of differential behavior in premarital fertility (Garenne & Zwang, 2006).

Premarital childbearing, conceptualized as giving birth before the first marriage was also included in the study to illustrate the influence of changing norms on marriage formation and fertility. Premarital childbearing could occur if an ever married woman had a child prior to her first marriage or if a never married woman had given birth at the time of survey. To make the distinction, the preferred term 'never married fertility' as used in this study refers to births by never married women. Age at marriage in the framework is influenced by the motherhood status at the time of marriage. In this case, the higher the age, the higher the risk of a premarital birth. In some societies, women are expected to show evidence of their fecundity before the finalization of the marriage. Hence, it is possible for premarital childbearing to facilitate the pace of entry into marriage, but this can change if intended husband happens to be the father of the child. Or else, women with premarital birth are most often marginalized at the marriage market, and marrying at later ages as a result. Premarital births by ever married women were measured based on the interval between the first birth and first marriage. Childbearing, in this case, was considered to be premarital if it occurred before the date of first marriage, or if the woman had never been married at the time of the survey.

Another normative behavior included in the framework is the age at sexual debut. It was assumed for the purpose of this study that a significant purpose of marriage is to provide a legitimate avenue for sex. Therefore, if it is permissible to obtain sex without marriage, then marriage will most likely be delayed to later ages, and there would be no need for entering into marriage. It is expected that women who are sexually inactive (virgins) before marriage are more likely to enter marriage unions at an earlier age than their counterparts who are sexually active. Early age at sexual debut is also expected to expose women to higher risks and exposure to childbearing, especially in Ghana where the patronage of contraceptives is quite low.

The following hypotheses are examined in the study:

- i. Married women with secondary education are more likely to have lower marital fertility rate than women without any formal education.
- ii. Women living in urban areas are more likely to have lower fertility than women living in rural areas.
- iii. The relative contribution of the changes in the marital structure to the decline of the overall TFR from 1988 to 2014 is greater than that of the changes in marital fertility.

2.9 Concluding remarks

In conclusion, existing literature on the relationship between the timing and prevalence of first marriage have been reviewed in this chapter. Existing studies show that fertility transition that begun in many of the Sub-Saharan African countries is now stalling at higher rates and this defies the conventional demographic theory. Current studies also indicate that nuptiality transition is ongoing in Sub-Sahara Africa with an increasing trend towards the delayed transition to first marriage. Current studies on the determinants of Africa's unique fertility decline indicates that changes in some socio-demographic factors such as; access to educational

level of women and increased urbanization are working together to influence marriage and fertility. In most of the studies, increased formal education for women emerged as a key factor contributing to the increase in the timing of first marriage and the subsequent decline in marriage prevalence. It is for this reason that the UN conceptual framework on first marriage pattern was adapted for this study.

Ghanaians are becoming more educated, with many women now being attracted to urban places of residence. These changes are expected to undermine the traditional norms, which previously controlled the entry into and exit from the marriage market. It is assumed, therefore, that the changes in socio-demographic characteristics of women in Ghana would have an influence on the timing and prevalence of marriages and hence fertility transition. The study is thus focusing on Ghana, to illustrate how the components of fertility change are related to changes in the age composition of the proportion of ever married women and marital fertility. In the next chapter, the methodology of the study is described.

CHAPTER THREE

METHODOLOGY

3.1 Introduction

In the previous chapter, relevant literature to the study is discussed. It has been observed that a variety of socio-demographic factors work together to influence the timing and incidence of marriage formation, as well as decisions of women regarding childbearing. It has been observed that nuptiality could be an avenue through which these socio-demographic variables could influence fertility levels (Hertrich, 2017). A study of the nuptiality-fertility relationship, therefore, requires a systematic methodology. In this regard, this chapter discusses the methodology that guides the study. The main sources of data used for the analysis are described and is followed by a description of the methods used for the analysis of the data.

3.2 Study setting

Ghana, a country located in West Africa with its land area of 238,537 sq. km has one of the fastest growing populations. The population of the country increased rapidly over the years from 6.7 million in 1960 to 18.9 million in 2000 and reached 24.2 million by 2010. The population growth rates have averaged between 2.4 - 2.7 ever married from 1960 to 2010. With a current population growth rate of 2.5 ever married, the population is expected to double in 28 years with fertility and mortality being the key components of population change.

It was the aim of the Government of Ghana to reduce the total fertility rate from 5.5 to 5.0 by the year 2000, to 4.0 by 2010 and, 3.0 by 2020 (Government of Ghana, 1994). A fairly lower TFR of 4.0 children per woman had been recorded in 2008 before the targeted year of 2010 and the rapid decline of total fertility from almost seven to four children per woman within half of a decade has been a subject of great interest to many demographers (Blanc & Gray, 2000). However, fertility decline has stalled around four (4) births since the year 1998 hence the

possibility of achieving the targeted TFR of 3.0 by 2020 seems far from reality. Consequently, the extent to which the changes in the age compositions of the proportions of women never married and ever married influenced the fertility transition in Ghana is the focus of this study.

As per the classical demographic transition theory, structural improvements in the socio-economic conditions of the country are expected to play a significant role in this fertility decline. For instance, some Development Plans have been initiated since Ghana's independence to improve the quality of life of all Ghanaians. These include the Economic Recovery Programme which was launched in 1983, the Structural Adjustment Program in the 1990s and Ghana Poverty Reduction Programs in the 2000s. Consequently, remarkable growth has been achieved in the economy of Ghana. Real Gross Domestic Product (GDP) growth increased steadily from as low as 3.7 percent in 2000 to 6.2 percent in 2006 and, hit the highest rate at 8.4 percent in 2008 (Kwankye & Cofie, 2015). Having experienced a steady increase in economic growth 7 percent per year since 2005, Ghana attained a lower middle-income country status in 2010. These changes would most likely affect other social and demographic factors that will affect marriage formation and total fertility.

Significant progress, for instance, has been made in the area of educational attainment. In 2010, 23.5 ever married of the population aged above six years had never attended school compared to 73 ever married in 1960 (Ghana Statistical Service, 2013). The improvement in access to education has been most rapid for women than for men. As high as 83 percent of women had never attended school in 1960 compared to the current 28. percent. Comparatively, 63% of men had never attended school in 1960 but this proportion only declined to 18.3 percent in 2010. Likewise for past school attendance, male attendance increased by about 100 percent between 1960 and 2010 (from 18 percent to 38.7 percent), whilst, the female proportion increased by almost 400 percent (from 7.4 percent to 33.0 percent) within the same period. This is an indication that females may have achieved higher improvements in educational attainment

than males and that the gap between male and female educational levels seems to have narrowed.

The improvement in female education could be an outcome of the commitment demonstrated by Government of Ghana to girls' education through the creation of a special unit devoted to girls' by the Ghana Education Service in the year 1997. The newly created Girls' Education Unit (GEU) was tasked to increase enrolment, retention, and achievement of girls, particularly in the sciences, technology, and mathematics. To further expand access to higher education, the Government of Ghana launched the Free SHS (Free Senior High School) policy in September 2017.

The structural improvements in access to education since 1960 have had the effect of keeping more women in school and have in effect, reduced the supply of marriageable women into the marriage market. Increased schooling may have the effect of weakening social norms governing entry into the marriage market as well as fertility regulation as described in the conceptual framework for this study.

Census data further show that in 1960, 23.1 percent of the population lived in urban areas but this proportion increased steadily to 50.1 percent in 2010. The Economic Recovery Programmes initiated in the 1990s opened many job opportunities that attracted many females to live and work in Ghana's rapidly growing urban spaces to the extent levels of urbanization has increased by over 100 percent between 1960 and 2010. It has now become easier for more educated and economically active females to be working in the urban labor market. These changes can have significant implications for marriage, the family and demographic processes and its outcome on fertility.

This, in a way, will most likely affect the extent of family formation in the country. The factors responsible for the variations fertility have been identified to include contraceptive use,

educational attainment and age at marriage (Ghana Statistical Service, 2013; Nonvignon & Novignon, 2014). The extent to which these may have changed over a period of three decades need to be clarified.

The proportion of adult Christians increased by over 60 percent from 42.8 percent to 71.2 percent in the past 50 years (1960-2010) and a sharp decline in the traditional faith from 38.2 percent to 5.2 percent. within the same period. In Ghana, the societal norms and structures most often place sexual intercourse within the security of marriage, hence religious and moral norms towards pre-marital sex have often favored abstinence.

Structurally, as per the demographic transition model, once a fertility decline is onset, it is expected to continue without significant interruption until the replacement level of two births per woman is reached. This has been a historical trend for some countries. The trend in Ghana, however, has been different. The country's fertility rate, which was described as high and stable lying in the neighborhood of between 6.7 and 7 children per woman in the 1960s and 1970s (Gaisie, 2005) declined steadily in the 1980s and rapidly in the 1990s and has eventually stalled to around 4 births since the 2000s. The stall in the fertility decline in Ghana and its dynamics have been explained needs further clarification (Agyei-Mensah, 2007).

The timing of first marriages and marriage prevalence are areas that need attention in order to appreciate the stalls in Ghana's fertility decline. Suggestively, changes in the age composition of the ever-married/never marriedtogether with dynamics of marital and non-marital fertility have been of great significance in explaining the decline. It has been evident that there has been a marked shift in Ghana from early marriages towards delayed marriages. Additionally, the percentage of never married women was observed to have increased from 8.5 percent in 1960 to 29.5 percent in 2010 (Ghana Statistical Service, 2013). Empirical studies from some countries indicate that an acceleration of fertility decline has been achieved through shifts in

age at marriage and or marital fertility. The extent to which this is true for Ghana has rarely been documented in recent times.

3.3 Sources of data and study population

3.3.1 Sources of data

This study is based on existing quantitative data from the Ghana Demographic and Health Surveys (GDHS) conducted in Ghana from 1988 to 2014. The GDHS is a cross-sectional, nationally representative population-based survey. Hence data are collected from a nationally representative sample of household heads, women aged 15 - 49 (reproductive age) and men aged 15 - 59 years. The Ghana Demographic and Health Surveys (GDHS), which forms part of the global DHS Program, aims at generating recent and reliable data on fertility, family planning, infant and child mortality, maternal and child health, and nutrition. Data generated have been very helpful in making informed policy decisions on reproductive health at both national and regional levels. The GDHS dataset also forms part of an international database managed by the DHS Program that is freely accessible to researchers investigating related topics of interest. The first DHS in Ghana was conducted in 1988 and subsequently five other surveys (1993, 1998, 2003, 2008 and 2014) have been conducted (Ghana Statistical Service (GSS), Ghana Health Service (GHS), 2015; Ghana Statistical Service (GSS), Ghana Health Service (GHS), 2009; Ghana Statistical Service (GSS), Noguchi Memorial Institute for Medical Research (NMIMR), 2004; Ghana Statistical Service (GSS) and Macro International Inc, 1999; Ghana Statistical Service (GSS), 1989, 1994). All the surveys have been conducted by the same organisation, and uses similar data collection procedures. Therefore the GDHS has a very rich comparable database for a study of this nature that seeks to analyse a long-term trend of fertility and nuptiality issues in Ghana. Data on marriage and fertility in the published GDHS reports are by nature, presented descriptively. This study, consequently, seeks to

provide a much more detailed discussion on the changing trends and patterns in fertility behaviour of the ever married and never married women in Ghana.

The Ghana Demographic and Health Surveys use a two-stage sampling method, cluster sampling and then household sampling within each cluster. Samples in the GDHS are stratified according to the administrative regions by using a probability proportional to size at the initial stage of selection. The resulting over-sampling of rural and urban areas was corrected by applying sampling weights to the data, which ensure the validity of the sample.

Three different types of questionnaire are used in the DHS to collect data: the household questionnaire, the women's questionnaire, and the men's questionnaire. However, for the purposes of this study, data from the women's questionnaire were used. The women's questionnaire collects demographic and socio-economic information from all eligible women in the reproductive age group (15–49 years). The women's questionnaire provides data on nuptiality-related variables such as marital status and age at first marriage as well as fertility-related variables such as children ever born and age at first birth. These variables are vital in the study of the changing patterns of marriage on Ghana's fertility transition.

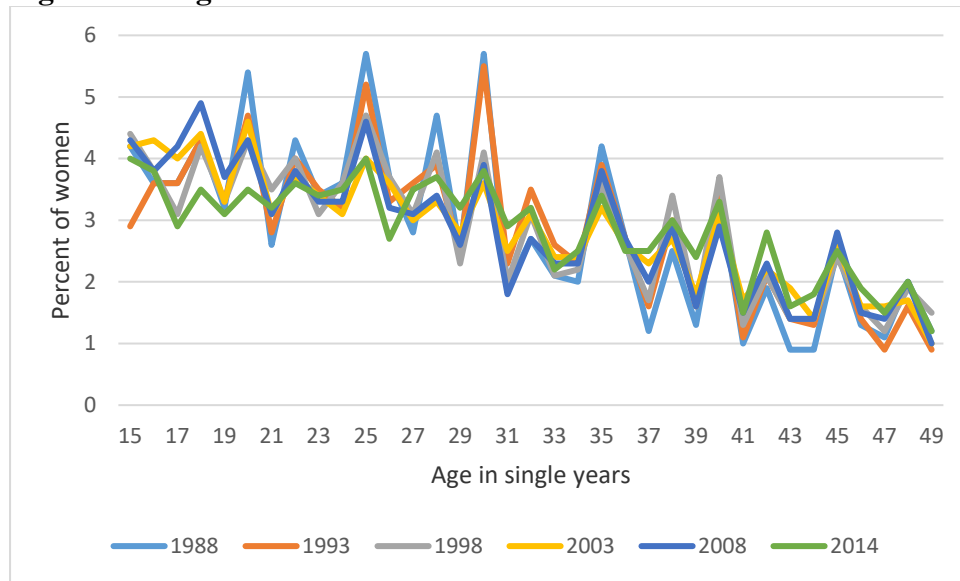
The surveys use similar sampling methods and survey instruments to collect the data, thus making it possible to compare fertility and nuptiality indicators over the 26-year time period. Using the dataset from the successive surveys was of great benefit to the study as each survey gives independent estimates of the same sets of measurement and relationships (Reda & Lindstrom, 2014). The dataset was subsequently weighted in order to show Ghana's population structure using the sampling weight provided in the GDHS. The data analysis has been done using SPSS version 20.0 whilst Stata version 14.0 software was used mainly for the computation of fertility (based on the Stata module, *TFR2*) (Schoumaker, 2013).

3.3.2 Study population

The survey population used in this study includes all women of reproductive age in the GDHS from 1988 to 2014. In all a total of 33,895 women aged 15-49 have so far participated in the various rounds of the surveys since 1988. The unit of analysis is the individual woman of reproductive age (WRA). These women were classified as never married and ever married so as to identify the changing role of ever marital and never marital fertility in the fertility transition of Ghana. Ever married women in the study are defined as women who are currently married or living together with their partners and those that were formerly married (divorced, separated or widowed at the time of the survey). The study of the ever married women was restricted to women aged 20 years and over. This restriction was influenced by the observation that majority of the women in the 15-19 age group have not yet transitioned into their first marriage at the time of the survey. On the other hand, 'never married women' as used in this study would refer to the women who have not entered into any marriage or union as at the time of the survey.

3.4 Data validation

The data was validated in order to observe the accuracy of the reported ages. This became necessary as age misreporting may bias the estimates of the age specific fertility rates used in the computation of the TFRs. The quality of the data on current age of the women in single years, was therefore, evaluated with the aid of a line graph illustrating age in single years for all the women (See figure 3.1). Age heaping was observed around digits ending zero (0) and five (5). This may be attributed to misreporting ages because of inadequate records of vital registers. To minimize these biases the reported ages of the women were grouped into seven five-year age interval groups.

Figure 3. 1 Age distribution of women 1988-2014

Source: Computed from GDHS 1988, 1993, 1998, 2003, 2008 and 2014

3.5. Main variables used in the study

3.5.1 The outcome variable

Different outcome variables were used in this study to achieve different objectives. Total fertility rate was the main outcome variable for the description of fertility trends and differentials. Total fertility rate was defined as the average number of children a woman is likely to have if the current age-specific fertility rates remain constant throughout her childbearing years. The TFR was estimated by using the number of births to women in the three years preceding the survey. Total fertility rates (TFRs) were computed by aggregating the Age Specific Fertility Rates (ASFR) in 5-year age groups and multiplying the sum by five. Details of computation are illustrated in Appendix B. Marital fertility was the main outcome variable used for the determinants of fertility by the ever married women. This variable was obtained from the sum of the age specific marital fertility rates for each age group. In chapter eight, 'never married motherhood status' at the time of survey was the main outcome variable used in examining the likelihood of a never married woman to have ever given birth. This was defined as, having at least one live birth, by a never married woman at the time of the survey.

This variable had two outcomes: one (1) for those who had ever given birth and zero (0) for those who had never given birth.

3.5.2 Explanatory variables

Age at marriage was the main independent variable used in the analyses of marital fertility. This variable was categorised as early for women who married before age 20 and late if marriage occurred at age 20 or older.

The study was based on cross-sectional data from successive surveys and in order to have uniformity in the computations for comparison across the survey years, variables that have not been consistently included across survey years were not included. The selected variables were recoded into categories for meaningful analysis. (Table 3.1).

Table 3. 1 Variable description and categories

Variable Name	How Variable was coded in the study
Marital Status	Never-Married Ever married
Time at first sex	Before first union At first union
Timing of first Marriage	Late marriage (<i>if first marriage occurred at age 20 or older</i>). Early marriage (<i>if first marriage occurred before age 20</i>)
Motherhood status at time of first union	Pregnant at the time of union (<i>if the interval between first marriage first birth is less than 8 months</i>) Did not have a child (<i>if first birth of 8 months or more after the first marriage</i>) Had a child before first union: <i>first births occurred before first marriage</i>).
Current age in 5 years groups	15-19 20-24 25-29 30-34 35-39 40-44 45-49
Type of place of residence	Urban Rural
Highest educational level	No education Primary Middle/JSS/JHS

	Secondary +Higher
Religion	Catholic Other Christian Moslem Traditional No Religion
Ethnicity	Akan Ga-Adangbe Ewe Guan Mole-Dagbani Other
Type of Marriage	Monogamous Polygynous (<i>presence of co-wives</i>)
Ever use of a modern, traditional or folkloric method of contraception	Ever used contraceptives never used contraceptives

3.6 Data analysis plan

Different statistical analytical techniques is used to achieve each specific objective outlined for this study. Marriage and parenthood, being life course events, have attracted a growing body of statistical techniques for analysis of variables (Hertrich, 2017). The underlying principle for the use of multiple methods is that, nuptiality as a field of study, is limited by the absence of a unifying and acceptable analytical technique. This may be partly due to the reliance on the use of repeatable events alongside that of non-repeatable events. Marriage as an event of study could be entered, exited or re-entered at any period, thereby making nuptiality a more complicated area of study. However, transition to first marriages, which has been the focus of this study, has been treated as an irreversible event.

The techniques applied have been used in many nuptiality and fertility related studies and evaluated to be reliable. The description of the analysis has been divided into three separate but related parts that are linked to each objective of the study.

3.6.1 Methods used in the analysis of timing and prevalence of marriage

The study acknowledges the fact that timing of first marriage and the proportion of the ever and never married remain the basic features of a population that are used to describe the marriage patterns. Therefore, in order to meet the first objective of this study, which is, to investigate nuptiality levels, trends and patterns in Ghana from 1988 to 2014, different analytical tools were used to describe the timing of first marriages and proportions married at given ages.

Firstly, the influence of socio-demographic factors on the timing of first marriages was examined using descriptive techniques of simple tabulations and cross-tabulations to describe the association between dependent and independent variables within and across the survey years.

Data on current marital status and age at first marriage for the ever married as well as the current age of the never married were used to describe transition to marriage. These data were used as a basis for the computation of the Singulate Mean Age at Marriage (SMAM).

3.6.2 Methods used in the analysis of timing of first marriages

Timing of first marriage in this study refers to the age at which a change in marital status from never married to ever married occurred, and this is estimated by the age at first marriage as reported by respondents. Age at first marriage is an important variable in the study of timing of marriages as it provides critical information on the marital history of women, which is often linked to their fertility. This age can be directly estimated from retrospective account by the respondents. The age as reported from respondents in a survey of this nature may sometimes be limited by age misreporting or recall biases as vital registers are not properly kept in Ghana. The reported ages were therefore categorised to minimise the biases. Timing of first marriages can also be estimated indirectly from nuptiality tables or using the Singulate Mean Age at

Marriage. The Nuptiality table is a statistical model that conceptually traces the life history of a cohort of never married women through their entire life under the assumption that they are subject to the current observed schedule of age-specific marriage rates. The nuptiality table at best, gives a synopsis of the proportion of never married women who gets married at the different ages and their average expected years to marriage from each age. However, due the complicated nature of its computations, the SMAM which is much more simpler to use was adopted for this study. Thus to achieve methodological rigour, both direct and indirect methods for the estimation of marriage timing have been used in this study.

3.6.3 Singulate mean age at marriage (SMAM)

The Singulate Mean Age at Marriage is used to estimate the average number of years spent in the single state by those who do eventually marry. SMAM being an indirect measure, has an advantage in its ease of calculation, as data required for computation are easily accessible. The SMAM also summarises various indicators such as person-years lived, proportions ever marrying, among others, in its computation into a single measure. This makes it a useful measure for comparing the timing of first marriages across surveys as well as between population sub-groups.

Computation was based on the assumption that no first marriage occur after age 50 or before age 15. This assumption was influenced by the idea that all women aged 15 and above are at the risk of entering into marriage. SMAM was used because it has been acknowledged as the most widely accepted status summary measure and a better estimate of the timing of first marriage (Isiugo-Abanihe, 1994; Nai Peng, 2007). Again, SMAM is considered more appropriate in situations where the reliability of self-reported ages is a matter of concern (Isiugo-Abanihe 1994; Avon 2012). The possibility of biases and recall lapses associated with self-reporting of age at marriage cannot be ignored among Ghanaian women. Besides, marriage

in Ghana may not be reported as a discrete time event because of the numerous cultural and religious processes involved, some of which may cover several months, therefore citing a specific time of marriage may be a difficulty for some women. Considering the unavailability of reliable and consistent vital registration data in Ghana, using an indirect method of estimating marriage timing is justified.

The basic assumption of the calculation is that the change in the proportion single from age x to age $x + 1$ is a measure of the proportion of a birth cohort that married at that age. Another assumption is that marriage patterns by age have been stable over time (and so there is a consistent fall in proportion never married with higher age). This means that there is no difference in mortality or in migration by marital status. Further details for the computation procedure for SMAM are explained in Appendix A

3.6.4 Methods used in the analysis of prevalence of marriage

The prevalence of marriage was examined by assessing level, patterns and trends in the proportions of ever married and never married women. In estimating the proportion of the ever married and never married women, the numerator used was the number of women in a specified age groups who indicated they are ever or never married at the time of the survey. The denominator was the total number of women in the same age group as at the survey year. Marriage prevalence was, therefore, derived by dividing the number of women in the reproductive age who have experienced the event of ever being married by the total number of women of reproductive age who are at risk of being married. This gave a summary measure of the ever married persons as proportion of the total women population.

At the bivariate level, patterns in the timing of first marriages were described as follows; marriages that occurred before age 20 were categorised as early whilst marriages that occurred at age 20 or older were categorised as later marriages. This categorization is by no means

standard but are being used, as a way of identifying how the timing of first marriages varied as per the socio-demographic characteristics of the women. This is consistent with previous studies in Sub-Saharan Africa (Garenne, 2004; Koski, Clarke & Nandi, 2017; Shapiro & Gebreselassie, 2014; Westoff et al., 1994) and other regions of the world (Engelen & Kok, 2002; Jones & Gubhaju, 2009; Nai Peng, 2007).

Those who married at age 20 and older were considered to have delayed their marriage. The choice of this age group of women to represent delayed marriage was influenced by the median age at marriage, which hovers around 19 years for most of the survey years. Consequently, the average of the median ages at first marriage for the six survey years was determined to obtain this cut off age.

Cross-tabulations were used to examine the association between age at first marriage and the socio demographic characteristics of the women. Chi-square test (χ^2) was done to examine the association between the selected socio-demographic variables and timing of first marriage. This is a test tool that helps to explain if the observed frequencies differ significantly from those which would be expected under theoretical assumptions. The level of significance was fixed at 95.0 percent ($p = 0.05$).

3.7 Methods used in the analysis of fertility levels, trends, differentials and determinants

The second objective of the study was to describe levels and trends of fertility in Ghana in relation to ever and never marital status. In order to examine the levels, trends and differences in marital fertility and never married fertility from 1988 to 2014, different levels of analyses were carried out. The methods used included; computing age specific fertility rates (ASFR) and total fertility rates (TFR) using exact exposure method, and logistic regression.

TFRs were calculated based on the period of birth and the age of the mother at the time of the birth of the children (See Appendix B). This calculation was facilitated by the use of Stata module *TFR2* for computing TFR from birth histories (Schoumaker, 2013). *TFR2* is a user friendly, flexible and robust tool for analysing fertility data for large dataset. The *TFR2* module was used to compute TFRs, age specific fertility rates (ASFR), age specific ever-marital fertility rates (ASMFR) age specific never marital fertility rates (ASNFR) as well as mother's age at childbirth (MAC). The Stata module *TFR2* was such a robust tool as it was able to produce rates that are similar in the DHS reports. This gave the researcher the motivation to rely on the module for the computation of rates such as ASNFR that had not been produced in the DHS report (Schoumaker, 2013).

Age specific ever marital fertility rates (ASMFR) and age specific never marital fertility rates (ASNFR) were further calculated for the other socio-demographic variables in an effort to explore the pathways through which the changing marital composition influence fertility transition in Ghana. Current fertility was estimated by using the number of births to women in the three years preceding the survey. Births in the last year would have been a better indicator of recent fertility, but considering the sample size, especially for some of the background variables, three years was deemed fit for this study (Schoumaker, 2013).

3.7.1 The use of rate ratios for multivariate analyses of fertility

The use of *TFR2* further made it easier to perform a multivariate study of fertility per each survey year. With the dependent variable as total fertility rate, the effect of timing of first marriage was examined after controlling for selected socio-demographic variables. Rate ratios were calculated and were used to describe the extent to which the changing prevalence and timing of marriage are associated with fertility transition in Ghana. Schoumaker (2013) in his description of the methods for computing rate ratios, explains that *TFR2* used Poisson

regression to compute fertility rates and conveniently computes rate ratios from a table of births and exposure (tabexp). In this case, Poisson regression was used to control the period of exposure in an offset and used to analyse birth histories of the women (Kabagenyi et al., 2015; Schoumaker, 2013).

TFR2 therefore, made it more convenient for a multivariate analysis of fertility for the three years preceding each survey. The categorical independent variables were dummy coded and were included as variables, together with dummy variables for five-year age groups. Schoumaker (2013) explains that the exponential of the regression coefficients of the independent variables could be interpreted as rate ratios (ratios of TFRs). The rates for the covariates, signifies the ratio of the TFRs for the categories of the independent variables compared to the reference category. Separate models were fitted for marriage timing and compared with other covariates. Rate ratios were used to examine the relationship between first marriage timing and total fertility rates. Three models were fitted for each of the survey years. The first involved running the model with timing of marriage as the only explanatory variable while the second model controlled for educational levels and contraceptive use. The final model included all the explanatory variables.

3.7.2 Multivariate analysis of never married fertility

In an attempt to examine never married fertility, all the never married women were further selected and the never married women who have had at least one child at the time of the survey were used to determine the factors that influence a never married woman to have a child. The dependent variable in this case was '*never married motherhood status*' at the time of survey. This was defined as, having at least one live birth, by a never married woman at the time of the survey. The dependent variable yielded a binary outcome as '*ever given birth*' (categorized as 1) if one is a never married mother or '*never given birth* (categorized 0)'. The binary logistic

regression model was therefore used to predict the probability that a never married woman chosen at random from all the never married women would have ever given birth or never given birth based on the selected predictors. The predictor variables included: level of education, religion, rural or urban residence, age at first sex, ever use of contraceptives, ethnicity, and age at the time of the survey.

3.8 Methods used for the decomposition analysis

The final objective of this study was to examine the relative contribution of the changing marital structure (changes in the proportions married at different ages) and marital fertility (the fertility of married women) and never married fertility to the changes in total fertility.

The final section of the analysis, therefore, attempts to explain how a decomposition analysis technique was used to determine the components of changes in Ghana's TFR due to three main components; marital structure, marital fertility and never marital fertility over the inter-survey periods 1988-1998, 1998-2008 and 2008-2014.

The decomposition technique used, initially developed by Kitagawa (1955) and later adapted by Retherford and Ogawa (1978), has variously been used in demography since the 1980s (Lindstrom & Woubalem, 2003; Palamuleni, 2011; Retherford & Rele, 1989; Shakya & Gubhaju, 2016). The technique was used to examine if the decline in fertility could be attributed to a decline in fertility among married or unmarried women or it is just a decline in the composition of the proportion of the ever married, or an increase in the compositions of the proportion never married. The use of this technique was initially based on the deduction that the main components that link marriage to fertility are the proportions ever married and marital fertility (Retherford & Ogawa, 1978). This study, however, attempts to expand its use to cover births to never married due to the growing evidence of births occurring among the never married.

Hence, a change in total fertility rate may be seen as a function of a change in the proportions never/ever married or changes in marital, never marital fertility. These components of change are however, acknowledged to be independent of each other. An increase in marriage age will most likely distort the proportions ever/never married, but this does not necessarily mean a decline in marital fertility. It is possible, for instance, for women who may have delayed their first marriages to give birth in quick succession in order to recover the lost reproductive time. More so, to the never married, childbearing before marriage could also be occurring among those who did not intend to marry at the time. Hence, it is important to study the relative influence of these variables by obtaining a summary measure, which could account for the total and compositional effect of the changes in age at marriage with regards to marital status as well as never/ever marital fertility. Decomposition analysis was deemed helpful in identifying the confounding compositional effects by separating demographic variables into specific components. To this end, the method proposed by Retherford and Ogawa (1978) was found to have been helpful this. Their method was however, limited to the study of only ever married women. Consequently, another method that was used by Lindstrom and Woubalem (2003) was adopted for this study and described as follows;

If the total fertility rate, (*TFR*) is the weighted sum of age-specific rates for the ever married women (*ASMFR*) and age-specific rate for the never married women (*ASNFR*), then following terms are defined:

F_{xm} is the age specific fertility rates for ever married women;

F_{xn} is the age specific fertility rates for never married women;

K_{xm} is the age specific proportions of women ever married and this represents the weight for the ever married women;

K_{xn} is the age specific proportions of never married women and this represents the weight for never married women;

By definition the total fertility rate is given by;

$$TFR = 5 \sum_x (K_{xm} F_{xm} + K_{xn} F_{xn}) \dots\dots\dots (1)$$

From this equation, it can be deduced that TFR at any time, t , is a function of proportions ever married, never married, as well as levels of ever marital and never marital fertility rates. Therefore, slight changes in F_{xm} , F_{xn} , K_{xm} and K_{xn} will cause a change in TFR and this raises a need to decompose the changes in TFR , because a change in TFR between two survey years would most likely be affected by the components of change. It is also possible that, the observed changes in the proportions ever married and never married and or changes in the marital and never marital fertility rates could offset each other's contribution to changes in total fertility rates. Hence, a need to decompose the components of change to unravel the relative contribution of each component.

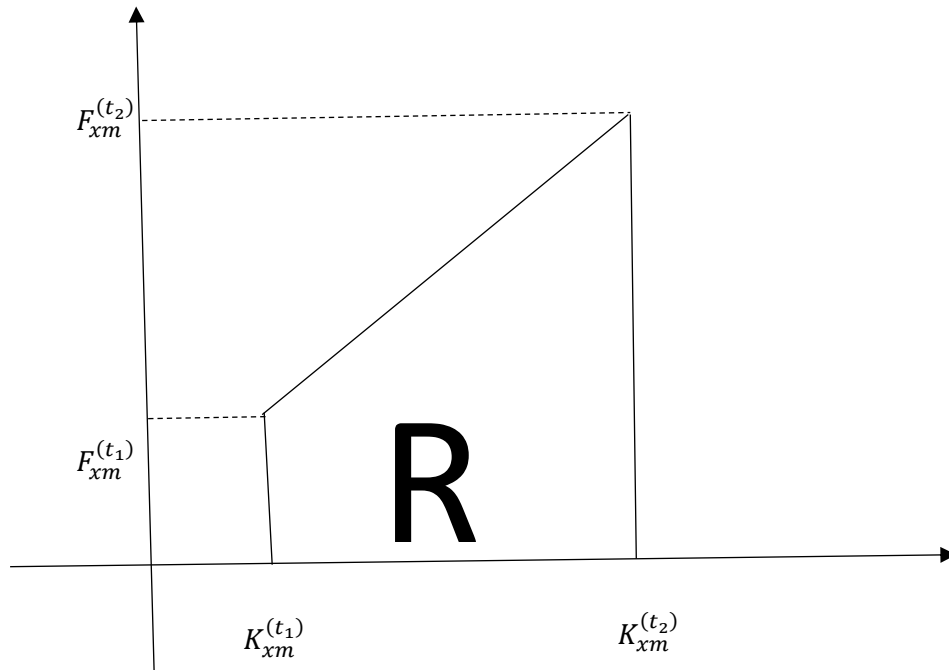
Decomposition will, therefore, be most helpful in tracing the relative contribution of ever and never married women in order to formulate appropriate nuptiality, influencing policy and interventions to control Ghana's fertility transition. Decomposition of the changes was also helpful in highlighting the quantum of change and the relative direction of the contribution of the ever married and never married to fertility change.

Decomposition of the components of change between period $t1$ and $t2$, according to Kitagawa (1955) will determine the extent of the change resulting from each of the components while holding the other constant. To this end, the change in the total fertility rate from the inter survey period $t1$ to $t2$, denoted as ΔTFR , is broken down into three components as;

- change in marital status composition
- change in marital fertility rate
- change in never-marital fertility rate

Changes in marital status composition can be broken down due to the age structures of the proportions ever married and that of the never married. Figure 3.2 shows the changes due to ever married. In this case we consider the change due to the proportion ever married.

Figure 3. 2 Changes due to ever married



As shown in the Figure 3.2 $K_{xm}^{(t_1)}$ is the proportion of women ever married at period t_1

$K_{xm}^{(t_2)}$ is the age composition of proportion of women ever married at period t_2

$F_{xm}^{(t_1)}$ is the age specific fertility rate for women ever married at period t_1

$F_{xm}^{(t_2)}$ is the age specific fertility rate for women ever married at period t_2

Area of region R multiplied by 5 is the change in total fertility rate due to the age composition of women ever married from period t_1 to period t_2 . The shape is a trapezium and hence, applying the area of trapezium to find the area of region R and multiplying by 5 gives the change in total fertility rate due to women ever married as;

Change due to the age composition of women ever married;

$$= 5 \sum_x \frac{1}{2} (F_{xm}^{(t_1)} + F_{xm}^{(t_2)}) (K_{xm}^{(t_2)} - K_{xm}^{(t_1)}) \dots\dots\dots (2a)$$

Applying the same analysis to that of changes due to the age composition of never married women from period t_1 to period t_2 gives the equation;

Change due to the age composition of nevermarried women;

$$= 5 \sum_x \frac{1}{2} (F_{xn}^{(t_1)} + F_{xn}^{(t_2)}) (K_{xn}^{(t_2)} - K_{xn}^{(t_1)}) \dots\dots\dots (2b)$$

Applying the same analysis to that of changes due to changes in marital fertility rate gives the equation;

Change due to fertilty of ever married women

$$= 5 \sum_x \frac{1}{2} (K_{xm}^{(t_1)} + K_{xm}^{(t_2)}) (F_{xm}^{(t_2)} - F_{xm}^{(t_1)}) \dots\dots\dots (2c)$$

Applying the same analysis to that of changes due to never marital fertility rate gives the equation;

Change due to fertilty of the never married women;

$$= 5 \sum_x \frac{1}{2} (K_{xn}^{(t_1)} + K_{xn}^{(t_2)}) (F_{xn}^{(t_2)} - F_{xn}^{(t_1)}) \dots\dots\dots (2d)$$

Combining all the changes gives the change in total fertility rate ΔTFR from period t_1 to period t_2 as;

$$\begin{aligned} \Delta TFR = & 5 \sum_x \frac{1}{2} (F_{xm}^{(t_1)} + F_{xm}^{(t_2)}) (K_{xm}^{(t_2)} - K_{xm}^{(t_1)}) + 5 \sum_x \frac{1}{2} (F_{xn}^{(t_1)} + F_{xn}^{(t_2)}) (K_{xn}^{(t_2)} - K_{xn}^{(t_1)}) \\ & + 5 \sum_x \frac{1}{2} (K_{xm}^{(t_1)} + K_{xm}^{(t_2)}) (F_{xm}^{(t_2)} - F_{xm}^{(t_1)}) \\ & + 5 \sum_x \frac{1}{2} (K_{xn}^{(t_1)} + K_{xn}^{(t_2)}) (F_{xn}^{(t_2)} - F_{xn}^{(t_1)}) \end{aligned}$$

From (1)

$$TFR = 5 \sum_x (k_{xm} F_{xm} + k_{xn} F_{xn})$$

Then, the change in the total fertility rate from the inter survey period t_1 to t_2 , denoted as ΔTFR , is broken down into the three components namely: change in the marital status composition [2a], change in marital fertility rates [2b], and change in never marital fertility rates [2c],

Hence,

$$\begin{aligned} \Delta TFR = 5 \sum_x \frac{1}{2} (F_{xm}^{(t_2)} + F_{xm}^{(t_1)}) (k_{xm}^{(t_2)} - k_{xm}^{(t_1)}) \\ + 5 \sum_x \frac{1}{2} (F_{xn}^{(t_2)} + F_{xn}^{(t_1)}) (k_{xn}^{(t_2)} - k_{xn}^{(t_1)}) \end{aligned} \quad [2a]$$

$$+ 5 \sum_x \frac{1}{2} (k_{xm}^{(t_2)} + k_{xm}^{(t_1)}) (F_{xm}^{(t_2)} - F_{xm}^{(t_1)}) \quad [2b]$$

$$+ 5 \sum_x \frac{1}{2} (k_{xn}^{(t_2)} + k_{xn}^{(t_1)}) (F_{xn}^{(t_2)} - F_{xn}^{(t_1)}) \quad [2c]$$

The first component of change [2a] is expected to capture the structural or compositional component of the change resulting from the changing age structure of the ever/ never married, whilst [2b] and [2c] may be called the direct components of change from the marital and never marital fertility (Vaupel & Romo, 2002). This decomposition was performed at the national level for the overall change in TFR as well as for the place of residence and educational attainment for the period under study. Then to track the changes, decomposition was further performed for each of the five inter survey year period. Details of the computation procedure are explained in Appendix C.

3.9 Limitations of the study and concluding remarks

This study is mainly an analysis of secondary data from the Ghana Demographic and Health Survey (GDHS) from 1988 to 2014, thus, it was limited in the definition and choice of variables to be used in the study. For instance, data collection focused mainly on individual records of women aged 15-49 years only. Hence, in this study, married women aged below 15 years were excluded. Meanwhile, adolescent fertility based on the World Health Organization's definition of adolescence which includes 10-14 years is possible in Ghana. Furthermore, the GDHS collected a detailed and comprehensive data on birth history to support the discussion on fertility transition in Ghana, however, the data on marital history were too short and scanty to support discussions on marriage transition.

Demographic and Health Surveys rely more on women's retrospective accounts of their own date of birth, first marriage and first birth and are therefore, subject to problems of recall, which can lead to underreporting. Also, GDHS data are mainly quantitative in nature, hence, limited when it comes to sensitive and qualitative data about attitudes, values, perceptions and beliefs that could explain the changes in marriage timing. These were therefore, not included in the dataset. Such information would have been helpful in obtaining a deeper understanding of why an increasingly higher proportion of women are choosing to delay their marriages. In addition, GDHS is a cross-sectional study, thus, causality cannot be determined only by using statistical analysis.

Moreover, marital status data in this study was limited to status at the time of data collection only. Detailed marital history was not collected in the DHS. Considering the importance of marriage in Ghana, it is quite possible that some of the married women could be widows or divorcees. This made it difficult to track the fertility history as per marital status. It was further assumed that the status of women remained the same for the mothers throughout the period of three years preceding the survey. This, however, may not always be realistic as it was possible

for unmarried mothers to have been married within a year. Besides while variables such as ethnicity cannot change with time, others like education, rural-urban residence and religion could change with time.

3.10 Concluding remarks

To conclude, this chapter has described the context of the study area. Significant social and demographic changes that could influence the timing and prevalence of marriages and its influences on fertility in the country are highlighted. Substantial increases in the proportion of women completing secondary education have been observed. Methodology for the study including sources of data, study population as well as variables used for the study have been described. In the subsequent chapters an attempt is made to examine the extent to which these variables affect marriage prevalence and its influence on fertility transition.

CHAPTER FOUR

BACKGROUND CHARACTERISTICS AND FERTILITY TRANSITION IN GHANA

4.1 Introduction

This chapter is divided into two main sub-sections. The first section seeks to describe the background characteristics of all the women (ever married and never married) used in the study. The second section examines the levels and trends in the quantum and tempo of fertility change in Ghana from 1988 to 2014. Studies have shown that fertility is closely linked to marital status (Hertrich, 2017). Besides, marriage exposes women to the risk of childbearing. Hence, the proportion of never married or ever married women at various age groups will most likely affect fertility levels in the country.

4.2 Background characteristics of women of reproductive age in Ghana

Description of the socio-demographic background of the women surveyed is an important step in understanding the findings of this study. The background characteristics are expected to influence the prevalence and the timing of first marriages, which eventually have an effect on fertility behaviours. The study, therefore, assumes that, background variables such as current age of the women at the time of survey, religious affiliation and place of residence, could play significant roles in explaining nuptiality patterns in Ghana and their relationships with fertility rates. The background characteristics are illustrated in Table 4.1.

The age structure of a population is an important demographic variable that could affect the timing of first marriage and childbearing experiences of women. Most marriages in Ghana are expected to occur before the age of 30, hence, the age structure, as depicted in Table 4.1, illustrates the fertility potential of the country. The proportion of women in age group declines with an increase in age across the survey years.

Table 4. 1 Percentage distribution of background characteristics of the respondents

Background characteristics	Survey year					
	1988	1993	1998	2003	2008	2014
Current Age						
15-19	18.9	17.6	18.8	20.2	20.9	17.3
20-24	19.3	18.2	18.6	17.8	17.9	17.2
25-29	19.3	18.5	17.9	16.7	16.9	17.1
30-34	14.3	16.3	13.5	14.1	13.1	14.6
35-39	11.8	12.7	12.9	12.7	13	13.8
40-44	8.1	9.3	9.8	10.2	9.6	11
45-49	8.2	7.4	8.6	8.4	8.7	9.1
Place of residence						
Urban	33.9	37.7	35.9	48.4	48.5	53.8
Rural	66.1	62.3	64.1	51.6	51.5	46.2
Educational attainment						
No education	39.7	35	29.1	28.3	21.2	19.1
Primary	16.3	16	18.1	19.9	20.1	17.8
Middle/JSS/JHS	36.5	38.8	42.5	40	41.5	41.1
Secondary/Higher	7.5	10.3	10.4	11.8	17.2	22
Ethnicity						
Akan	53	50.3	53.7	50.8	50.7	50.1
Ga Dangme	8.9	8.1	8.3	8.2	7	7.7
Ewe	16	15.1	15.8	13.1	12.9	13.5
Guan	2.3	2.2	1.5	2.6	2.5	2.3
Mole Dagbani	11	15.8	6.8	12.8	16.2	14.8
Other ethnic groups	8.8	8.6	13.9	12.5	10.7	11.6
Religious Affiliation						
Catholic	17.1	18	14.6	13.8	12.4	10
Other Christian	53.1	54.2	60.9	63.5	65.1	70.1
Moslem	9.9	11.7	11	15.6	15	15.1
Traditional	7.8	4.3	7.1	2.7	4.2	2
No religion	12.1	11.8	6.5	4.4	3.3	2.7
Contraceptive Use						
Never used	66.1	56.9	55.3	52.6	49.6	56
Ever used	33.9	43.1	44.7	47.4	50.4	44
Number of women	4488	4562	4843	5691	4916	9396

Source: Computed from GDHS 1988, 1998, 2008 and 2014

More than half of all the women are less than 30 years old. For instance, 51.5 percent were aged between 15-29 years in 1988 and 55.7 percent for the year 2008. The data reflects the youthful age structure of Ghanaian women, as nearly one out of every five of the women interviewed was aged 15-19 years. Meanwhile less than 10 percent of the respondents across all the survey years were aged 45-49 years. A higher proportion of women in their adolescent

years, as compared to the proportion of women in the oldest age group who may have completed their fertility, will most likely affect the incidence and prevalence of marriages.

The data also indicate that majority of the women were living in rural areas than in the urban areas. In 1988, for instance, as many as two out of three women lived in rural areas. However, the proportion of women living in urban areas increased over the survey years to the extent that by 2014 more women lived in urban areas than rural areas. This indeed is a reflection of the 2010 Ghana's population and housing census in which, for the first time, the proportion of the country's population living in urban area exceeded those living in rural areas. This further confirms that the GDHS data, in a way, reflects that of the data of the population and housing census. The increase in the proportion of women living in urban areas from 34 percent in 1988 to 54 percent in 2014 could affect the timing of marriages, as more women are expected to delay their marriages in urban areas than in the rural areas.

The data further shows that, a higher proportion of the women have been educated up to the Middle/JSS level as compared to the other educational levels. Almost 40 percent of the women in each of the survey years have attained the Middle/JSS level of education. The success of the educational sector improvement programme which was adopted, as part of the economic recovery program in the 1980s is evident. The proportion of women with secondary and higher level of education showed a consistent increase from 7.5 percent in 1988 to 22 percent in 2014. In contrast, those without any formal educational level declined rapidly from 39.7 percent to 19.1 percent within the same period. The observed improvement in educational attainment across the survey years will most likely influence marriage patterns in the country.

Ethnicity could also play a vital role in the variations of the levels and patterns of marriage prevalence. Addai (1996) observes that ethnicity in Ghana has affected access to political and economic power in such a way that, there is some hidden social prejudice among ethnic groups. This will most likely affect the incidence of marriage and fertility behavior. Different ethnic

groups may have different perceptions and opinions on the ideal age of marriage and the preferred age at first birth.

The data shows Akans as the most dominant group in Ghana with over 50 percent of women being Akans across all the survey years. Akans mainly have a matrilineal system of kinship, there is, therefore, higher value placed on females as they are expected to perpetuate the family lineage. Marriage and childbearing are, therefore, highly valued in the group. The higher the number of children, the higher the expected social status of women. On the other hand, the Ga-Dangme, consisting about eight percent of the women, practise patrilineal kinship systems. There is a stronger expectation for males to act as breadwinners for the family, as well as initiators of family formation. The various ethnic groups have their own unique culture, which may have a bearing on family formation. It is, however, possible that the current wave of modernization and formal education may have eroded some of the traditional norms and values in family formation and family size.

Religion is yet another influencing factor of fertility and nuptiality patterns. Fatalistic beliefs and strict adherence to pro-natalistic norms facilitate early marriages and early childbearing. Religious groups may use social values to regulate sexual behaviour and ensure fidelity to suit their doctrines and practices. The data shows that, majority of the women are Christians with the highest proportion of 70 percent across the survey years. Christians were classified as Catholics and other Christians. Catholics, by doctrine, have a strong stance against contraceptive usage and abortion (Addai, 1999; Heaton, 2011). Catholics teach that the principal purpose of sexual relation in marriage is procreation. However, the other Christians are more liberal in their views on contraceptives (Bakibinga, Mutombo, & Mukiira, 2015; Obeng, Jones, & Baffour, 2012). The other Christian women dominated all the groups as they ranged from 53.1 percent in 1988 to 70 percent in 2014. Marriage, according to Christians, should be monogamous whilst the other religions may support polygyny. The proportion of

Moslem woman ranged between 9.9 percent in 1988 to 15.6 percent in 2008. Whereas women with traditional religions were the least across the survey years, accounting for 7.8 percent in 1988 and 4.2 in 2014. Religious beliefs have been identified in previous studies as some of the barriers to fertility decline (Addai, 1999; Takyi & Addai, 2002).

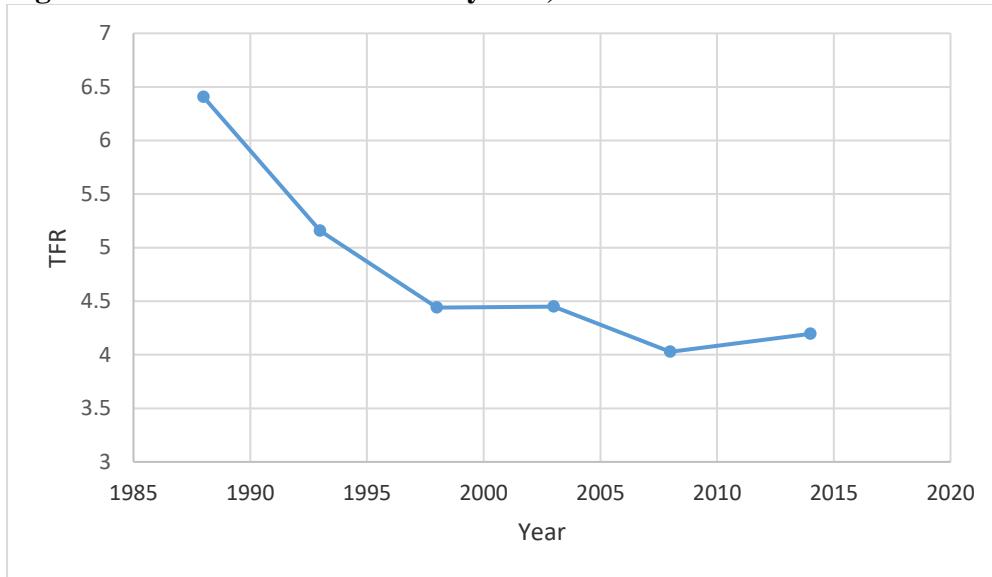
4.3 Fertility transition in Ghana

Changes in TFR could be influenced by the tempo effect and quantum effect. Quantum effect refers to the average number of children born to women in a hypothetical cohort of women, whilst the tempo effect relates to the timing of births by age of mother within the cohort (Rabbi & Kabir, 2015).

4.3.1 Levels and trends in the quantum of total fertility in Ghana

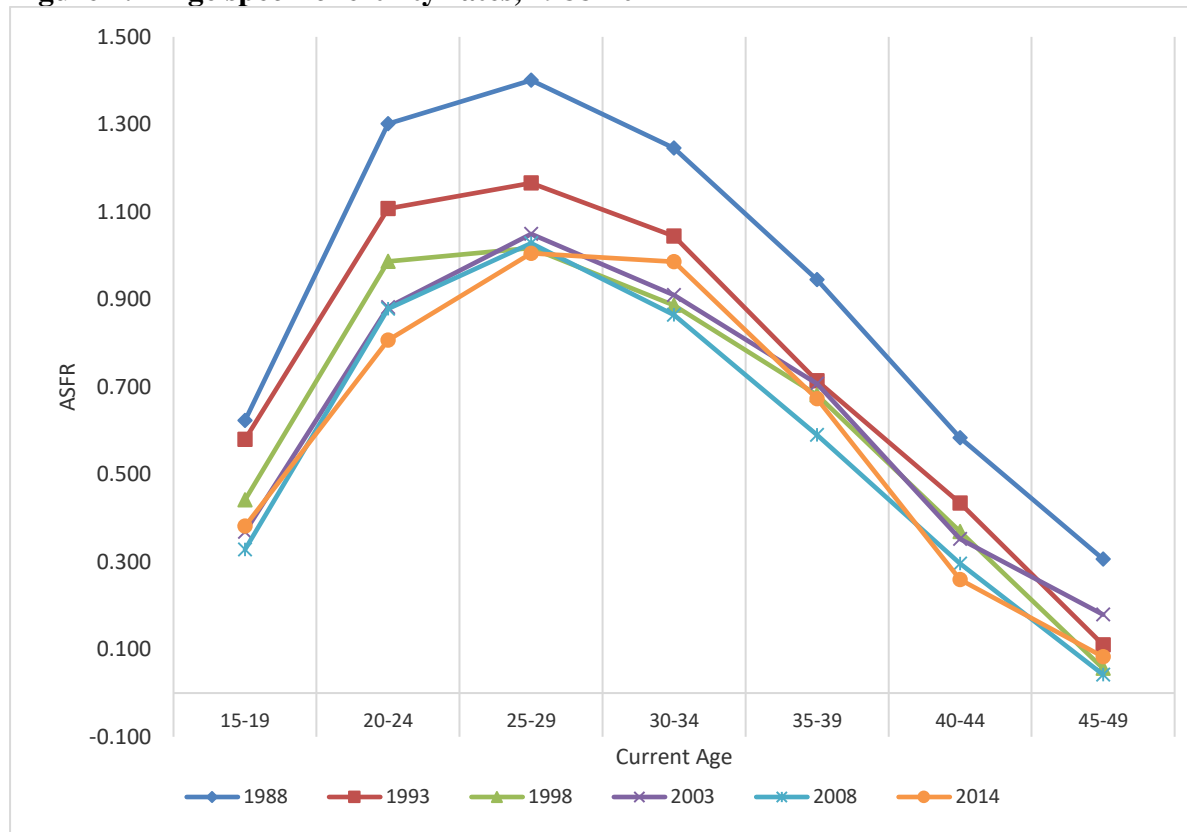
This section seeks to examine the levels and trends in fertility in Ghana from 1988 to 2014. The total fertility rate (TFR) for the three years preceding each survey from 1988 to 2014 is presented in figure 4.1. The TFR (Figure 4.1) shows a continuous decline from 1988 to 2008 and thereafter, a slight increase in 2014. The decline was most rapid from 1988-1998 when a decline of 2.0 was observed within a decade and, thereafter, stalled around TFR of four. A decline of 53 percent of TFR was observed between 1988 and 2014 but the decline was not uniform.

Figure 4. 1 Trends in total fertility rate, 1988-2014



Source: Computed from GDHS 1988, 1993, 1998, 2003, 2008 and 2014

Figure 4.2 shows the estimates of age specific fertility rates from 1988 to 2014. It can be observed from the data, that the ASFR has declined for all the age groups across the survey years with the greatest decline of 0.49 births occurring in the 20-24 year group.

Figure 4. 2 Age specific fertility rates, 1988-2014

Source: Computed from GDHS 1988, 1993, 1998, 2003, 2008 and 2014

The ASFR increases from the 15-19 age groups, peaks at the 25-29 age group, and thereafter declines. The change in ASFR is most rapid between the 15-19 and the 20-24 years for each of the survey years. The data indicates that fertility in Ghana is concentrated in the 25-29 age group for almost all the survey years. The study shows women between 25-29 years to have had the highest average number of children among all the age groups. In 2008, for instance, 25 percent of the TFR was recorded for that age group. An average of 39 percent decline was recorded by this age for the period under the study. Though adolescent fertility rate is still high, the over 63 percent decline from its highest of 0.125 to 0.076 is most encouraging as childbearing in the youngest years has the potential for fertility increase. Equally significant is the fertility among the oldest age group, which has health implications for the mother and the

child. Fertility was the lowest for this age group. In 1988, women aged 45-49 had an ASFR of 0.061 but this declined to about 0.017 in 2014.

4.3.2 The timing of fertility in Ghana

The use of TFR in describing fertility pattern is limited by its sensitivity to shifts in the age pattern or timing of fertility (Rabbi & Kabir, 2015). Further insights into the experiences of a single cohort of women who are passing through successive ages will be helpful in understanding the fertility transition of the country. Studying this cohort could provide an indirect measure of fertility for a hypothetical cohort of women since the changes in TFR could be confounded by changes in the timing of births across a woman's lifetime. Direct measures such as mean number of children ever born (quantum) provides estimates that relate to a specified period of time but not for a cohort. The cohort approach is hereby used to examine the timing of childbearing in order to understand the tempo effect of fertility.

In order to appreciate the timing of fertility, the percent distribution of total fertility was computed and the results illustrated in Table 4.2. Percent distribution of total fertility shows what percentage of total lifetime fertility occurs at specified age groups. This was obtained by dividing the ASFR by the TFR. This indicator was helpful in following a hypothetical cohort of women in order to describe the timing of fertility based on an assumption of a stable mortality.

Table 4. 2 Percent distribution of total fertility by age group 1988-2014

Survey Year	1988	1993	1998	2003	2008	2014
15-19	9.7	11.2	9.9	8.3	8.1	9.1
20-24	20.3	21.5	22.2	19.8	21.8	19.2
25-29	21.9	22.6	22.9	23.6	25.5	24.0
30-34	19.5	20.2	20.0	20.4	21.5	23.5
35-39	14.7	13.8	15.4	15.9	14.6	16.0
40-44	9.1	8.4	8.3	7.9	7.3	6.2
45-49	4.8	2.1	1.3	4.0	1.0	2.0
Total	100	100	100	100	100	100

Source: Computed from GDHS 1988, 1993, 1998, 2003, 2008 and 2014

In spite of the decline as indicated earlier, the percent contribution of adolescents to TFR is still high in Ghana; an average of nine percent was recorded across the survey years. This means that almost one out of ten births in the country occurs to adolescent mothers (see Table 4.2). The highest contribution of 11.2 percent occurred in 1993. It was however, encouraging to observe that the percent contribution to TFR by the oldest age group (45-49) declined swiftly from about five percent in 1988 to two percent. This age group, though with the least in terms of contribution to TFR, recorded the highest decline (-142 percent) in its contribution to TFR within the period under study. This is an indication that childbearing among the oldest women of reproductive age group is equally declining.

Besides, almost one out of four births occur to women aged 25-29, an indication that most childbirths occur at this age. The percent contribution to TFR by this age group increased by eight percent between 1988 and 2014. On the other hand, the data indicates the greatest increase in the contribution to TFR by women aged 30-34. In 1988, these women contributed 19.5 percent of the TFR but in 2014 their contribution increased to 23.5 percent.

4.4 Concluding remarks

Evidence from this chapter has shown that total fertility of the country declined from 6.4 in 1988 to 4.2 in 2014 a decline of about 53 percent. The rate of the decline was most rapid from 1988 to 1998 and slowed down to a stalling rate of about four from 2003 to 2014. It has been emphasized that fertility of a specific age group is the product of the proportion married at that age and the rate of marital fertility at that age (Westoff et al., 1994). It is, therefore, expected that changes in the timing of first marriages and the proportions married, will most likely distort the timing of childbearing in Ghana. hence, a need to study fertility of the married and the never married in the context of Ghana's fertility transition. The next chapter will, therefore, examine the changes in the timing and prevalence of marriage.

CHAPTER FIVE

NUPTIALITY LEVELS: TRENDS AND PATTERNS IN GHANA

5.1 Introduction

This section focuses mainly on the trends and patterns in the timing and prevalence of marriage in Ghana from 1988 to 2014. The age of transition to first marriage is an important demographic indicator for fertility transition in a country where the uptake of contraception by married women is very low. However, since the age of transition may not be synonymous with the age at first entry into sexual unions, a distinction is made between the proportion of ever married women and never married women. This is based on the assumption that the expected changes in the proportions married and never married will most likely affect fertility levels in the country. The influence of socio-demographic factors on the proportions who never or ever marry and timing of marriage as indicated by proportions marrying at given ages will be discussed.

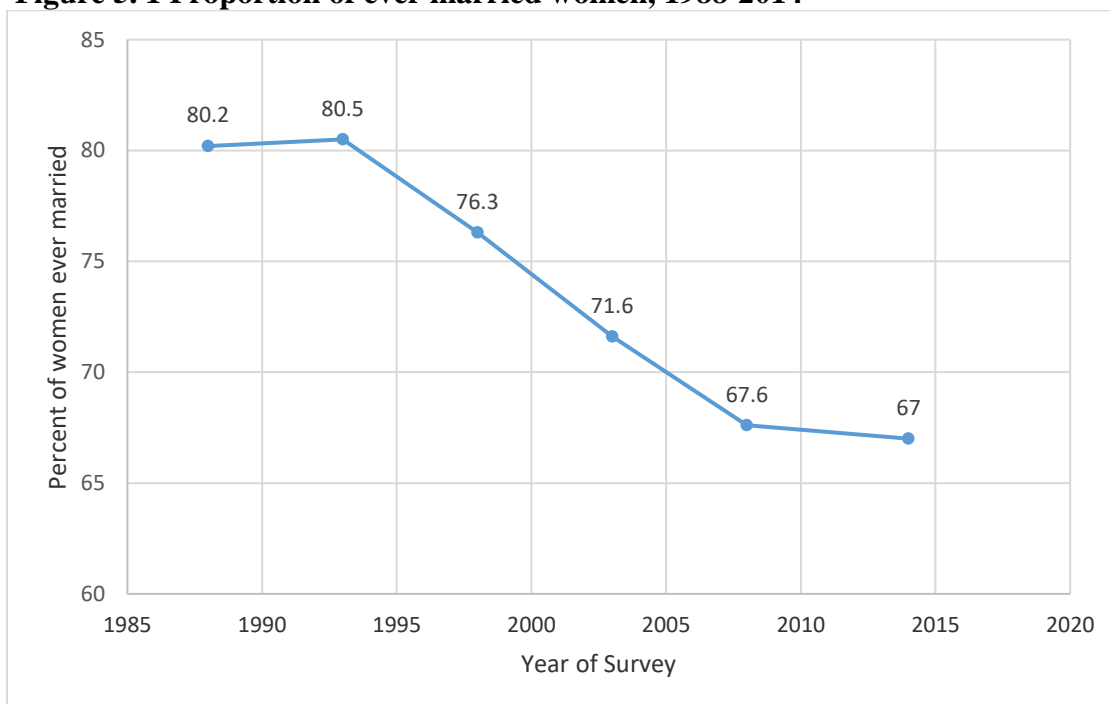
5.2 Marriage prevalence: trends and patterns in Ghana

Marriage prevalence is described by the proportion of ever married women by age 50. It is expected that by age 50 the probability of marrying would be negligible and also due to low risk of childbearing, not many women will desire to get married at this age for the purpose of procreation. It has been observed from previous studies that Ghanaian women remarry quickly after divorces or widowhood (Aryee, 1985; Awusabo-Asare, 1988), and to capture the effects of changes in the incidence and prevalence of marriage in the context of fertility transition, women were categorized as ever married or never married. The formerly married were, therefore, combined with the currently married and subsequently referred to as ever married women. Therefore, ever married women in the study refers to all women who have been married or lived with a man at least once in their lifetime even if their current marital status

may not be ‘married’. Much as marriage dissolution is evidenced and acceptable to Ghanaians, women do re-marry within the shortest time within their childbearing years. Hence, the time lost to exposure to risk of childbearing may not be noticeable. Figure 5.1 illustrates the prevalence of marriages in Ghana from 1988 to 2014.

The data are discussed in relation to the proportions of ever married women by age group. The numerator of each category in the ever married group is the sum of the number of women who are currently married as well as those who were formerly married. Whilst the denominator relates to the total number of persons in the corresponding age group.

Figure 5. 1 Proportion of ever married women, 1988-2014

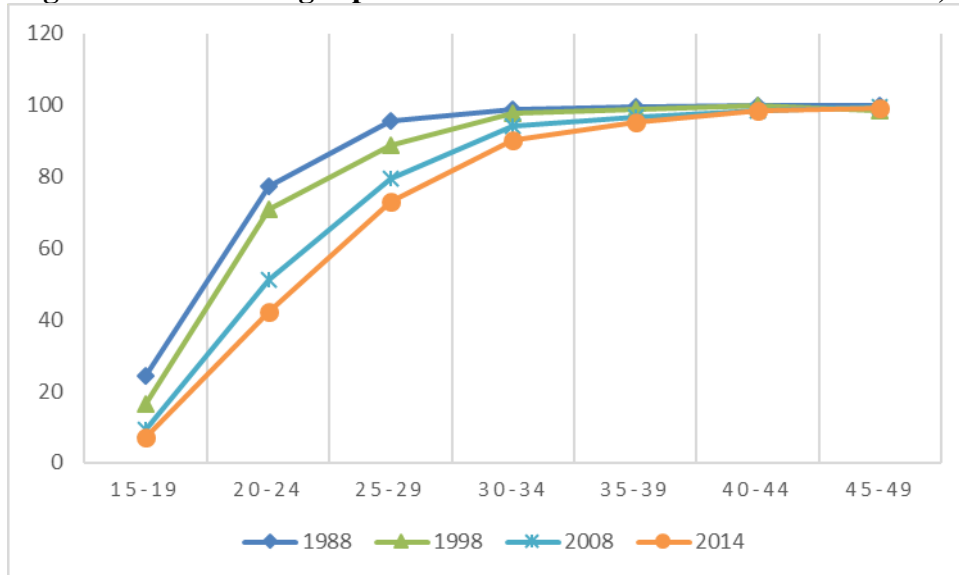


Source: Computed from GDHS 1988, 1993, 1998, 2003, 2008 and 2014

The overall proportions of ever married women from 1988 to 2014 is illustrated in Figure 5.1. The data show that the proportion of ever married women across all age groups steadily declined from 80.2 percent in 1988 to 67 percent in 2014. The decline was most rapid in 1993 and 2008. Indications are that fewer women are entering into marital unions in recent times than in the past, and age is one factor that can influence a woman’s transition to marriage.

Universal age at marriage is the age at which all women are married in a population. Figure 5.2 therefore illustrates the age-specific proportions of the ever married.

Figure 5. 2 Percent age-specific distribution of ever married women, 1988-2014



Source: Computed from GDHS 1988, 1993, 1998, 2003, 2008 and 2014

The data indicates that from 1988 to 1993, almost all the women had been married by age 50. However, the proportion of ever married women declined to 99.1 percent in 2014. The lowest prevalence was recorded in 1998 and that was about 98.6 percent. This is an indication that marriage prevalence in the country is very high and almost every woman gets married at least once in her reproductive years. The implication is that almost all women in their reproductive ages do eventually marry in Ghana.

It is further observed that by age 34, 99 percent of women had been married in 1988, but the proportion of ever married women at this age declined consistently over the years to 90 percent in 2014 (Table 5.1). Significantly, the proportion of adolescent females (currently aged 15-19) who had ever been in marriage declined rapidly from 24.3 percent in 1988 to just about 7.3 percent in 2014. This is an indication that early marriages are declining in Ghana and this is consistent with current trends in many countries in Sub-Saharan Africa (Amoo, 2017; Koski et al., 2017).

Table 5.2 shows marriage prevalence according to the socio-demographic characteristics of the women (Table 5.1). Prevalence was observed to be higher among women with lower levels of education (Table 5.1).

Table 5. 1 Percent distribution of ever married women by socio-demographic characteristics, 1988-2014

	1988	1998	2008	2014
Place of Residence				
Urban	73.9	69.2	60.5	63.8
Rural	83.4	80.3	74.2	70.9
Educational Level				
No education	92.5	89.9	92	92.5
Primary	80.2	79.1	75.5	72.4
Middle/JSS	70.3	69.8	61.1	65.4
Secondary/Higher	63.4	60	43.8	43.9
Religion				
Catholic	77.8	74.3	68	65.5
Other Christian	76.2	74.6	65.2	65.8
Moslem	85.8	74.8	70.1	69
Traditional	93.2	88.6	82	83.6
No religion	88.4	85.9	82.6	83.7
Ethnicity				
Akan	79.4	75.7	65.9	65.9
Ga	73.3	74	60.1	66.5
Ewe	76.2	73.4	71.6	66.1
Guan	80.8	79.2	66.4	69
Mole Dagbani	92.7	83.1	73.3	69.7
Other Ethnic	83.2	79.5	66.9	70
Type of Marriage				
Monogamous	66.2	76.8	80.1	83.7
Polygynous	33.8	23.2	19.6	16.3
Age at first Marriage				
Marriage before age 20	74.1	65.1	59.2	52.9
Marriage at 20 and older	25.9	34.9	40.8	47.1
Motherhood status				
Pregnant at time of union	16.7	24.6	17.7	13.3
Did not have a child	71.7	67.7	68.4	70.6
Had a child before first union	11.6	7.8	14.0	16.1

Source: Computed by researcher from GDHS 1988, 1998, 2008 and 2014

The higher the level of education the lower the prevalence of marriage. With regards to trends, the decline in the proportion of ever married women with secondary education far exceeded that of those with lower levels of education. For instance whereas 63 percent of women with secondary education were ever married in 1988, the proportion consistently dropped to 44 percent in 2014. Meanwhile the proportion without any formal education was almost about 92 percent and did not change much. In this case, expansion of formal education could be seen as having influenced marriage prevalence in Ghana.

Furthermore, marriage prevalence was highest for women of traditional religion, with 93 percent ever married in 1988. Prevalence was however lowest for the Christians, especially for the non-Catholic Christians. The decline in the proportion ever married was highest among the Moslems, than the other religious groups. The findings in this study are consistent with that of Aryee (1985), in which higher proportions of Moslems and Traditionalists than Christians were found to have ever married. Nevertheless, marriage prevalence declined for all the religious denominations across the survey years.

Marriage prevalence also varied with ethnicity. The highest proportion was found among the Mole-Dagbani; this group resides mainly in Northern Ghana. The high prevalence may be linked to marriage norms that support polygyny and early marriage. This ethnic group is predominantly Muslim, with many scattered rural communities. Aryee (1985) also observed the highest marriage prevalence for this group. However, decline in marriage prevalence occurred among all groups and was greatest for the Mole-Dagbani than all the other groups. For instance, about 92.7 percent were observed to have ever married in 1988 but in 2014, only 70 percent were observed to have ever married.

It is clear that the prevalence of marriage has gradually declined per the background characteristics of all the women. This will most likely have an impact on marital fertility,

especially when contraceptive prevalence rate is low in the country. The extent to which this assertion holds true for Ghana will further be interrogated in the next chapter.

Besides the prevalence of marriage, some noteworthy observations were made about ever married women that may have some bearings on the changes in marriage prevalence and its influence on fertility transition. It was observed that marriage in Ghana is predominantly monogamous as indicated in the data, with over two out of every three women being married to one husband, without any co-wives. The proportion of women in polygynous unions were observed to have declined steadily from 33 percent in 1988 to 22.7 percent in 2014. This may possibly explain the reduced decline in marriage prevalence in Ghana. Polygyny is a type of marriage in which a man is simultaneously married to more than one wife. This marriage type provides higher chances for all women to get married in a population (United Nations Department of International Economic and Social Affairs, 1988). This practice is observed to have some influence on marriage prevalence and fertility. Marriage prevalence will, therefore, be higher in areas where it is most practiced (Cahu, Fall & Pongou, 2014).

It was further observed that most women marry at earlier ages than later. However, the proportion of women who marry at the later age has been observed to have increased across the years. In 1988, only 24 percent of the women married at age 20 and above but in 2014 as high as 46 percent of the women indicated that they first married at 20 and above. Higher age marriage has been observed to most likely result in lower fertility (Nahar, Zahangir & Islam, 2013).

Another observation was that childbearing before marriage seems to be on the increase among married women. The data indicates that majority of the women entered into their first marriage in their nulliparous state. Evidently, about two out of three women did not have a child at the time of marriage. However, the proportion of women who had pre-marital birth has been

observed to have increased from 11 percent to 15.9 percent between 1988 and 2014. This increase has been consistent since 1998.

Pre-marital childbearing experience is one issue that is emerging in the literature as having an influence on timing of first marriage (Ntoimo & Isiugo-Abanihe, 2014). The expected sequence would have been marriage followed by first sexual experience and then pregnancy but indications are that the first sexual experience is occurring before marriage. Pre-marital births could have the tendency of accelerating the timing of first marriages. However, this is more likely to occur if the intended husband happens to be the biological father of the child Calves (1999). Further research in this area would be required in order to appreciate the context of the changing marriage prevalence in Ghana. Moreover, it has been observed that single mothers are most often marginalized at the marriage market compared to single women without children (Calvès, 1999).

5.3 Proportion and differentials of never married women in Ghana

This section aims to describe the influence of socio-demographic variables on proportions of the never married in various age groups in Ghana. Never married women refers to women who have never entered into any marriage/union. Never married women would represent the proportion of women who may have deferred or postponed marriage at various ages and have therefore, never been in any union at the time of the survey. The proportion never married is an estimated complement of the proportion ever married.

The proportion never married is often assumed to increase in populations with relatively high ages at first marriage. This assumption is based on the perception that persons who delay the decision to marry may have a higher risk of remaining unmarried (Engelen & Kok, 2002). To appreciate trends and patterns in delayed marriages, it will, therefore, be necessary to distinguish changes in proportion never married from the timing of marriages.

Ghana ranks highest among countries in West Africa in terms of proportions never married. Data from the most current DHS 2014 indicate 32.9 percent of Ghanaian women to be never married. This is rather high as compared to neighbouring Côte d'Ivoire (30.2%), Burkina Faso (17.5%) and Togo (26.5%) as presented in Table 5.3.

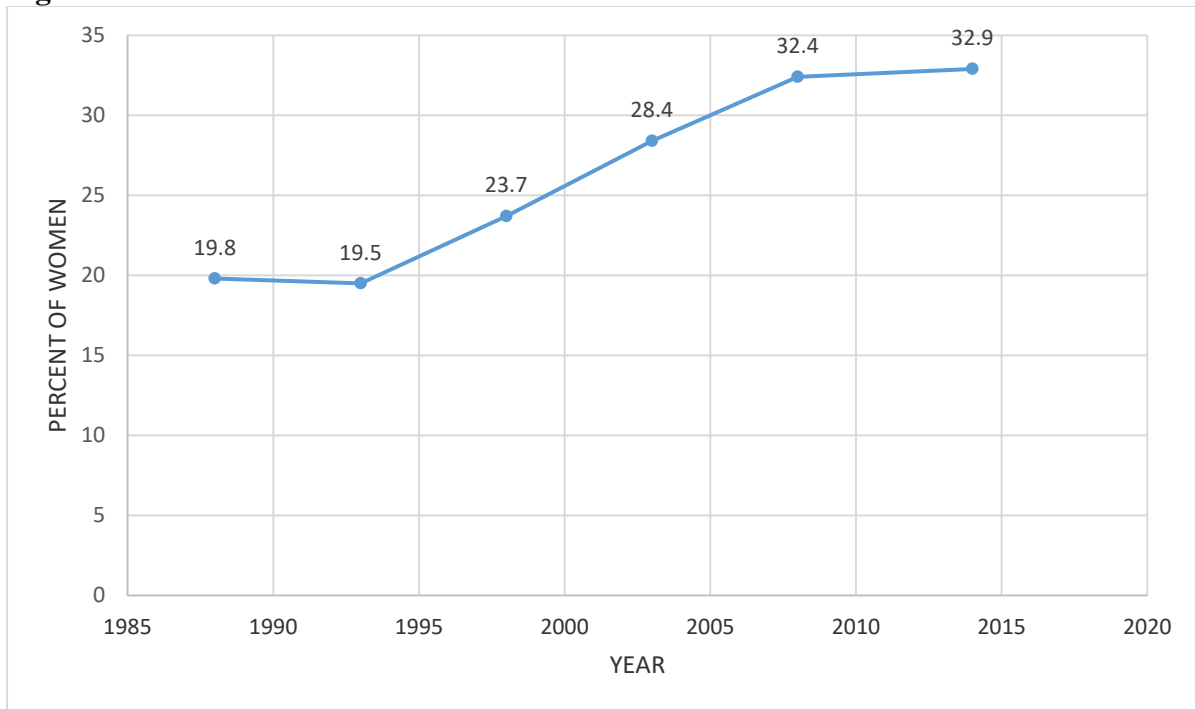
Table 5. 2 Percent distribution of marital status in West Africa

Country	Year	Never Married	Current Married	Living Together	Divorce	Separated	Widows	
Benin	2011-2012	24.1	54.9	15.5	0.8	3	1.8	100
Burkina Faso	2010	17.5	75.6	3.8	0.3	1	1.8	100
Côte D'Ivoire	2011-2012	30.2	39.3	23.4	4.9		2.2	100
The Gambia	2013	29	66.1	0.3	2.6	0.5	1.5	100
Ghana	2014	32.9	42.2	14.4	3	4.8	2.7	100
Guinea	2012	22.5	72.5	1.1	1.5	0.7	1.7	100
Liberia	2013	31	27.9	30.4	1.3	6.7	2.7	100
Mali	2012-2013	13.6	83	1.6	0.4	0.5	0.8	100
Niger	2012	7.9	88.4	0.2	2.3	0.1	1.1	100
Nigeria	2013	23.9	69.4	2	1.1	1	2.5	100
Senegal	2015	30.6	64.5	0.2	3.4	0.2	1.1	100
Sierra Leone	2013	28.4	62.6	2.8	0.8	2.8	2.5	100
Togo	2013-2014	26.8	51.4	14.9	1	3.3	2.6	100

Source: Compiled by researcher from DHS reports from West African Countries

Figure 5.3 illustrates trends in the proportion never married. From Figure 5.3, a considerable increase in the proportions of never married women is observed between 1988 and 2014. These proportions have consistently increased from 19.8 percent in 1988 to 32.9 percent in 2014.

Figure 5. 3 Percent distribution of never married women 1988-2014



Source: Computed from GDHS 1988, 1993, 1998, 2003, 2008 and 2014

Table 5.4 shows the proportions never married within each age group between 1988 and 2014 in Ghana. The proportion never married varied with changes in age structure across the survey years. For instance, the proportion never married declines with increase in age. The proportion never married remains higher in the younger age groups especially in the adolescent years but declines rapidly in the early twenties to a negligible level in the late forties.

Table 5. 3 Percent age specific distribution of never married women, 1988-2014

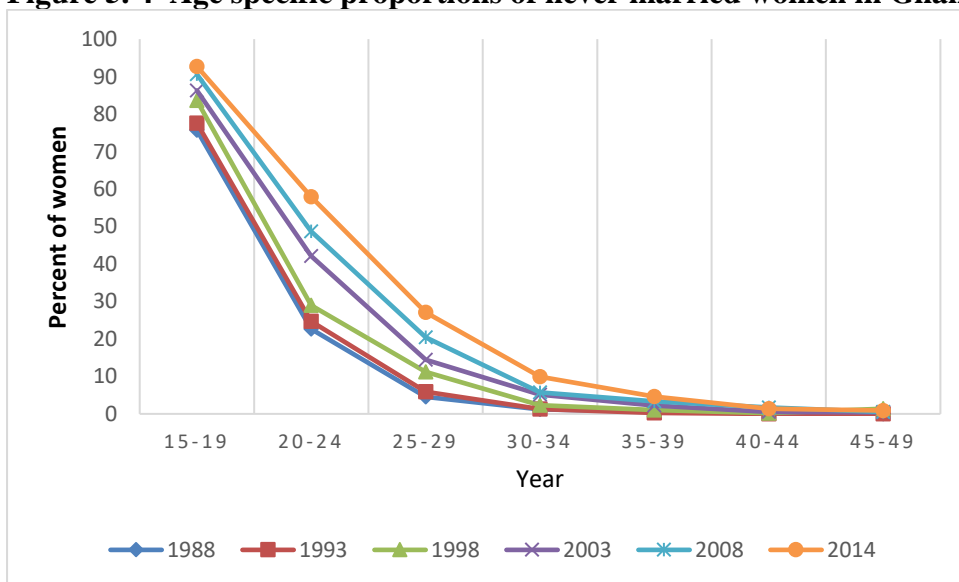
	1988	1993	1998	2003	2008	2014
15-19	75.7	77.6	83.6	86.3	90.6	92.7
20-24	22.6	24.7	29.0	42.1	48.7	57.9
25-29	4.5	5.9	11.2	14.4	20.4	27.1
30-34	1.2	1.3	2.3	5.1	5.7	9.9
35-39	0.6	0.3	1.0	2.2	3.3	4.6
40-44	0.3	0.0	0.2	0.5	1.7	1.4
45-49	0.0	0.0	1.4	0.4	0.5	0.9

Source: Computed from GDHS 1988, 1993, 1998, 2003, 2008 and 2014

Almost 91 percent of women were never married by age 19 in 2008. A very low proportion (0.5%) of females was never married at ages 45-49 in that same year. A similar trend was observed across the survey years. It is significant to note that the proportion of adolescents, aged 15-19, who were never married at the time of the surveys steadily increased from 75.7 percent in 1988 to 92.7 percent in 2014. In addition, about 75 percent were never married by age 19 in 1988. A very high proportion (i.e. 93 percent) were never married at that age in 2014. This is an indication that more adolescents are postponing marriage in Ghana.

The increase in the proportions never married is even more evident when women aged twenty and above are observed. Hence, 22.6 percent of women aged 20-24 years were never married in 1988 but in 2014 as high as 58 percent of women of that same age were never married. The proportions of the never married were quite lower at the prime reproductive age period (20-29 years) between 1988 and 1998 when compared with 2008 and 2014.

Figure 5. 4 Age specific proportions of never married women in Ghana 1988-2014



From Figure 5.4, it is clear that over the period under study, the slope of the curve of the proportion of women living in the never married state has shifted rightward. Indications are

that over time, the proportion of never married women at the specified age is increasing; first marriages are therefore being postponed. When the relative proportions of never married women in the age group 25-29 were observed, a lower proportion was recorded in 1988 (4.5%). This, however, consistently increased at a very rapid rate to 27.1 percent in 2014. This confirms the fact that relatively more women are deferring their first marriage in recent times than in the past. However, postponement of marriage became substantially most evident for the proportion of never married women aged above 35. In 1988, only 0.6 percent of women were never married but in 2014 as high as 4.6 percent were never married (Table 5.4).

For the purpose of this study, women who were never married at age 40-49 were categorized as being in a state of terminal celibacy (Garenne, 2016). This concept has been used in the study of marriage in Sub-Saharan Africa. Terminal celibacy used to be rare in Ghana in the 1980s and the 1990s but it is gradually becoming a recognized phenomenon in recent times. For instance, the proportion of women aged above 40 in the never married state is observed to have increased about eleven times from 0.1 percent in 1988 to 1.1 percent in 2014 (Table 5.4). From all indications, the proportion never married at higher ages have increased in recent times. The trends and differentials by socio-demographic variables in the proportion never married are illustrated in Table 5.5.

Table 5. 4 Proportion of never married women by socio-demographic characteristics, 1988-2014

	1988	1998	2008	2014	1988-2014
	%	%	%	%	% Change
Type of Place of Residence					
Urban	26.1	30.8	39.5	36.2	27.9
Rural	16.6	19.7	25.8	29.1	43.0
Educational Attainment					
No Education	7.5	10.1	8	7.5	0.0
Primary	19.8	20.9	24.5	27.6	28.3
middle/JSS	29.7	30.2	38.9	34.6	14.2
Secondary/Higher	36.6	40	56.2	56.1	34.8
Religion					
Catholic	22.2	25.7	32	34.5	35.7
Other Christian	23.8	25.4	34.8	34.2	30.4
Moslem	14.2	25.2	29.9	31	54.2
Traditional	6.8	11.4	18	16.4	58.5
No religion	11.6	14.1	17.4	16.3	28.8
Ethnicity					
Akan	20.6	24.3	34.1	34.1	39.6
Ga	26.7	26	39.9	33.5	20.3
Ewe	23.8	26.6	28.4	33.9	29.8
Guan	19.2	20.8	33.6	31	38.1
Mole Dagbani	7.3	16.9	26.7	30.3	75.9
Other Ethnicity	16.8	20.5	33.1	30	44.0

Source: Computed by researcher from GDHS 1988, 1993, 1998, 2008 and 2014

With regards to educational attainment, never married status increased with higher levels of education and this was consistent across the survey years. In 1988, 7.5 percent of the women with no formal education were never married but the proportion was as much as 36.6 percent higher for women with secondary or higher education (Table 5.5). Apart from women with no formal education, the proportion never married has generally increased in all the survey periods. The most significant change in the proportion never married was for women with secondary education where an increase from 36.6 percent in 1988 to 56 percent in 2014 was observed. As expected, the proportion never married was always higher in urban areas than rural areas. For instance, in 1988, 26.1 percent were never married; this consistently increased

and peaked to 39.4 percent in 2008. The change was much higher in rural areas, 43 percent when compared to that of urban areas (28%). Apparently, the urban-rural difference is narrowing.

The never married women were higher among Christians than the other religious groups. The least proportion was recorded among women associated with the traditional religion. Correspondingly, the percentage changes were higher in some of the religious groups such as Moslems and Traditionalists. Significant increases were also observed among the various ethnic groups, with the Mole-Dagbani showing the greatest increase of 76 percent of never married women between 1988 and 2014. Only seven percent of their women were never married in 1988, but as at 2014 as high as 30.3 percent were never married. The reasons for this great increase needs further investigations.

In all the changes in the proportions observed, that of the never married status could be attributed to improvement in educational level for women, and urbanization. Women with higher levels of education were more in the never married status than those with lower levels of education.

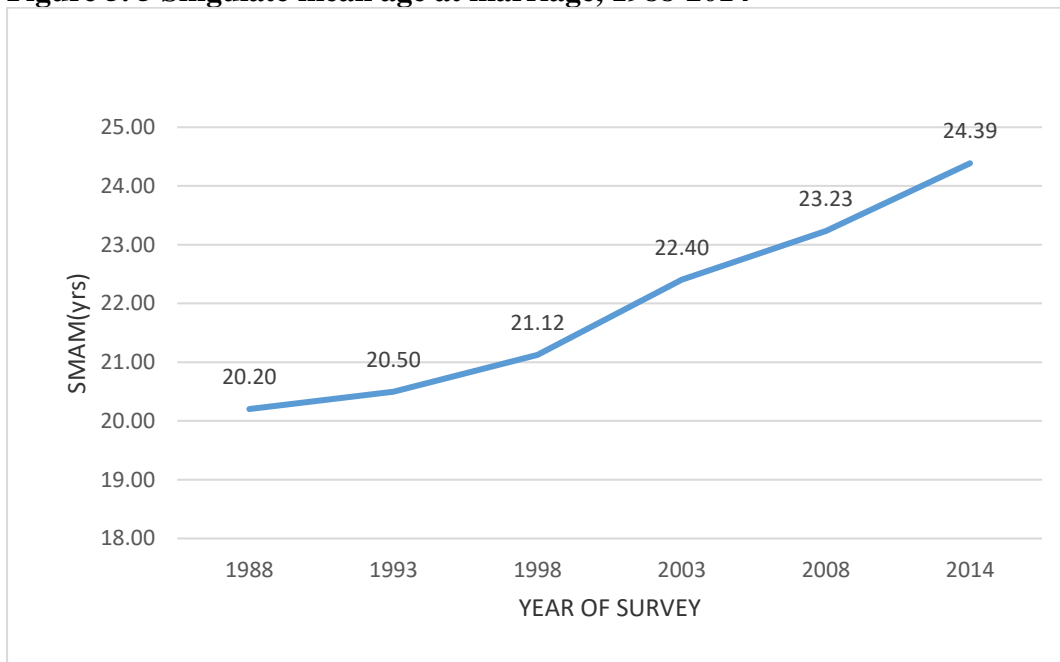
5.4 Trends and patterns in the Singulate Mean Age at Marriage

The timing of marriage (i.e. age at first marriage) and prevalence of marriage (proportions married) have been recognized as key predictors of marital fertility. Age of entry into first marriage could be used as a proxy in the estimation of the proportion of a woman's reproductive life span which is exposed to the risk of childbearing. This is particularly important for countries like Ghana where the use of contraceptives among married women is relatively low.

It has also been reported that higher age at first marriages often results in a more stable marriage as women enter into marriage with a greater emotional and physical maturity. Higher age at marriage is, however, associated with higher risk of extramarital childbirth and its associated

consequences of single parenthood (Subaiya & Johnson, 2008). This section attempts to examine the extent to which socio-demographic factors influence the timing of marriage as indicated by changes in the Singulate Mean Age at Marriage (SMAM). The SMAM shows the average number of years spent in the single state among women who marry. Figure 5.5 illustrates the observed trends in SMAM from 1988 to 2014.

Figure 5. 5 Singulate mean age at marriage, 1988-2014



Source: Computed from GDHS 1988, 1993, 1998, 2003, 2008 and 2014

It can be observed from Figure 5.5 that SMAM increased by about 4.2 years within the survey period, an increase of about 17.2 percent between 1988 and 2014. The data indicates that there has been a consistent increase in SMAM from 20.2 years in 1988 to 24.4 years in 2014. This is an indication that marriage is being delayed in Ghana.

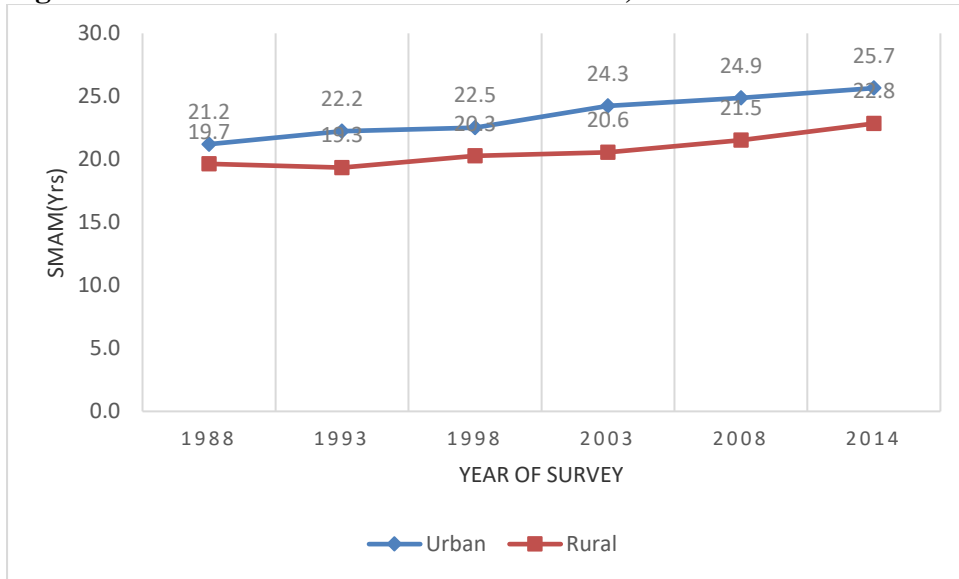
Table 5. 5 Trends and differentials in singulate mean age at marriage by selected background variables

YEAR	1988	1993	1998	2003	2008	2014	% CHANGE
Place of Residence							
Urban	21.2	22.2	22.5	24.3	24.9	25.7	21.2
Rural	19.7	19.3	20.3	20.6	21.5	22.8	15.7
Educational Attainment							
No education	18.7	18.1	19.8	19.4	19.4	20.1	7.5
Primary	19.4	19.4	20	21.2	20.9	21.9	12.9
JSS/JHS	20.7	21	21.1	23.1	23.6	23.8	15
Sec/higher	23.3	24.9	24.9	26.5	26.9	27.8	19.3
Ethnicity							
Akan	20.3	20.6	21.2	23	23.7	24.8	22.2
Ga-Adangbe	21.7	22.4	20.3	23	25.5	26.2	20.7
Ewe	20.7	21.4	22.2	23.5	22.3	25.3	22.2
Guan	20.7	19.5	21.2	22.7	21.4	24.8	19.8
Mole-Dagbani	18.1	18.6	20.2	19.9	22.2	22.8	26
Other	19.2	19.5	20.6	21.2	22.7	22.5	17.2
Religion							
Catholic	20.2	20.8	21.2	22.7	21.4	24.4	20.8
Other Christian	20.9	21.1	21.2	23	23.7	24.8	18.7
Moslem	19.2	19.5	21.2	20.7	22.3	23.2	20.8
Traditional	18	17.1	19.8	21.3	20.6	21.9	21.7
No Religion	18.5	18.1	19.6	19.2	21.5	21	13.5

Source: Computed by researcher from GDHS 1988, 1993, 1998, 2003, 2008 and 2014

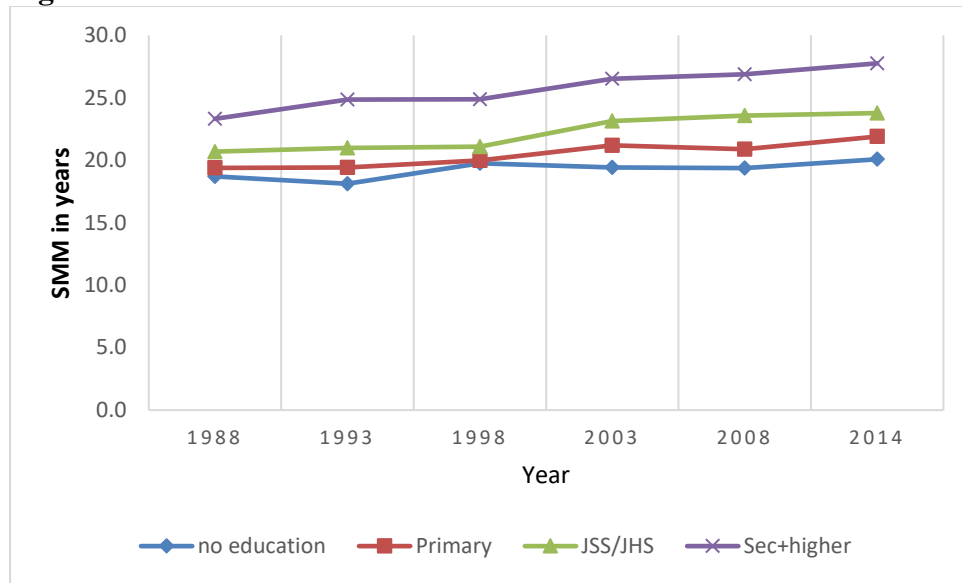
In Table 5.6, the trends and differentials in SMAM are illustrated. The table further shows the percentage change in SMAM between 1988 and 2014. It is clear from the table that SMAM increased for almost all the background variables. The SMAM, as expected, was higher for women living in urban areas than for those living in rural areas. Marriages in rural areas tend to be early due to stronger beliefs in timing norms that support marriages. The percentage change in SMAM from 1988 to 2014 for urban areas was higher than in the rural areas. Again, the gap between SMAM for the rural and urban women also widened between 1988 and 2014. In 1988, a gap of 1.6 years was observed as compared to 2.8 years for and 2014. This is an indication that the pace of delaying marriage is increasing in urban areas than for rural areas. Nonetheless, SMAM increased for both the urban and rural areas.

Figure 5. 6 Rural-urban variations in SMAM,1988-2014



Source: Computed from GDHS 1988, 1993, 1998, 2003, 2008 and 2014

The educational level of women has consistently appeared in various studies as a determinant of the timing of first marriage (Garenne, 2004, 2014; Shapiro & Gebreselassie, 2014). Schooling in itself has the ability to delay the transition to first marriage. Therefore, the longer the duration of schooling, the higher the age at first marriage. Formal education could also change people’s values, norms and attitudes toward marriage and hence weaken the prevailing timing and marriage prevalence norms in a society. The findings of this study in Figure 5.7 confirm such assertions.

Figure 5.7 Educational levels and SMAM 1988-2014

Source: Computed from GDHS 1988, 1993, 1998, 2003, 2008 and 2014

The association of educational levels and SMAM has been consistent over the past two and half decades (Figure 5.7). For any of the survey periods, SMAM increased with higher levels of education. For instance, in 1988, women without any education spent 18.7 years in the single state when compared to 23.3 years for those with secondary and higher education. This, in effect, highlights the important role played by formal education as an agent of social change. SMAM showed consistent increase for all the educational categories, with the highest increase of 16.6 percent for the women with secondary and higher education whilst the least change of only 6.8 percent occurred for women with no formal education.

Concerning religious affiliation, SMAM was highest for Christians than for those of other religious affiliations throughout the survey years. An SMAM of 20 years was observed in 1988 for Christian women, as compared to 18 years for women of traditional religion. A similar pattern was observed for 2014, where an SMAM of about 25 years, which was higher than the 21 years for women with no religion, was observed for Catholic women. However, SMAM increased for all the religious affiliations within the period under study. The increase in SMAM showed some variation from 1988 to 2014 with respect to religious affiliations. The greatest

increase of about 17.8 percent was recorded for women of the traditional religion, whilst the lowest increase of 15.3 percent was for women of the other Christians category.

Ethnicity also plays a dynamic role in the timing of marriages. Marriage prevalence and timing norms vary according to one's ethnicity. These norms are communicated through sanctions and rewards to facilitate entry into marriage at specific ages. The data suggests not many variations in ethnicity. With the exception of 1998, Ga-Dangme women had the highest SMAM relative to the various ethnic groups whilst the Mole-Dagbani had the lowest SMAM. Again, SMAM increased for all ethnic groups as indicated in Table 5.5.

Thus, it is clear that SMAM and, hence, timing of first marriages have been increasing in recent times. The extent to which this will affect fertility is not clear. The changes in marriage timing seems consistent with the changing socio-demographic conditions in the country. There have been marked improvement concerning female school enrolment since 1988. This means more girls are being kept in school for longer periods leading to delays in the transition to first marriage. A consistent trend toward higher mean age at marriage among younger women is to be expected in the near future and this may have implications for fertility transition in the country.

5.5 Concluding remarks

In this chapter, an attempt is made to describe the trends and differentials in the timing and prevalence of marriages in Ghana. This study established that there has been a decline in the prevalence of marriage as well as delays in the timing of first marriages. The long held assumption that marriage is universal for women in the country (Aryee, 1985; Awusabo-Asare, 1988) seems to have been weakened as it has emerged that some women were still not married by the age of 49 in 2014 as compared to 1988 when all women had been married by age 45. The study confirms results from earlier studies at the global level and in Sub-Saharan Africa

(SSA) which postulate that the age of entry into first marriage has steadily increased (Garenne, 2004, 2014; Hertrich, 2017; Ortega, 2014), resulting in an increasingly higher proportion of women spending a longer duration of their reproductive years in the never married status.

The study further indicates that the timing and prevalence of marriage were influenced by the changing socio-demographic conditions in the country. Specifically, increased access to formal education for women and urbanisation were found to have had the greatest and most consistent influence. This evidence confirms previous studies in the country (Aryee 1985; Ohenba-Sakyi, 1989) and in the SSA region (Shapiro & Gebreselassie, 2014) which suggests that the timing of marriage is susceptible to rapid changes with modernisation. Thus, the introduction of policies such as the Free Compulsory Universal Basic Education (F-CUBE) and free Senior High School (SHS) which aim to expand access to (higher) education for every Ghanaian would most likely keep more girls in school, and hence further delay entry into first marriage. This is especially as these educational policies are coupled with related mentorship and youth coaching programs, direct/indirect mentorship from known educated career women, increased number or proportion of educated parents (who are also more likely to keep particularly their female children longer in school) and the intensified campaign and crackdown on early child marriages by governments and allied organisations.

In addition, time spent in being sexually active in the never married state will most likely increase (Milly Marston et al., 2009). This may have some dire implications, as more women may then be vulnerable to STDs and unexpected pregnancies. An increase in pre-marital sex in the context of delayed marriage will have precarious effects. A study of 33 Sub-Saharan African countries observed an elevated risk of HIV/AIDS infection among the never married sexually active women than the currently married (Bongaarts, 2007).

It is expected that changes in the proportion of women ever married and the increases in the timing of marriage that were observed in this chapter may have some influence on Ghana's fertility transition. Evidence from this chapter also indicates profound changes that have occurred in the marriage prevalence and timing of marriages over the three decades under study.

To conclude, this chapter has shown the importance of the changing socio-demographic conditions such increased access to formal education and urbanisation in influencing the timing of first marriages. Subsequent chapters will examine how these changes are affecting fertility in Ghana.

CHAPTER SIX

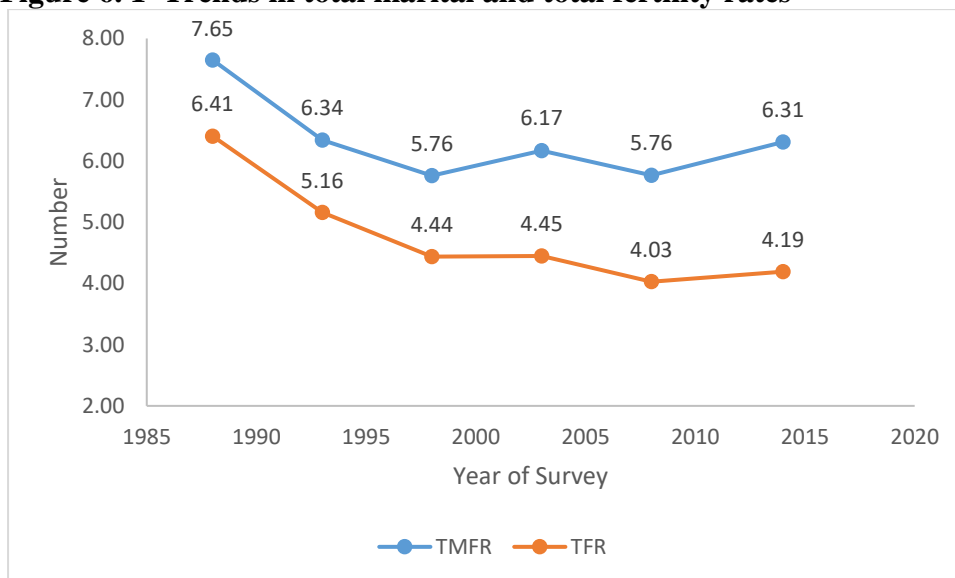
CHANGES IN MARITAL FERTILITY IN GHANA

6.1 Introduction

Nuptiality and fertility are interrelated because nuptiality has an influence on fertility. In the previous chapter, the levels, trends and differentials in the timing and prevalence of marriage from 1988 to 2014 were highlighted. It emerged that marriage prevalence has declined consistently over the study period. In societies where childbearing is mostly confined to marriage, lower proportions of ever married women will most likely result in lower fertility. It is for this reason that nuptiality and fertility are often studied together. In this chapter, an attempt is made to examine the changes in fertility among the ever married women. The discussion is limited to ever-married women aged 20 years and above.

6.2 Trends and differentials in marital fertility rates

Figure 6. 1 Trends in total marital and total fertility rates

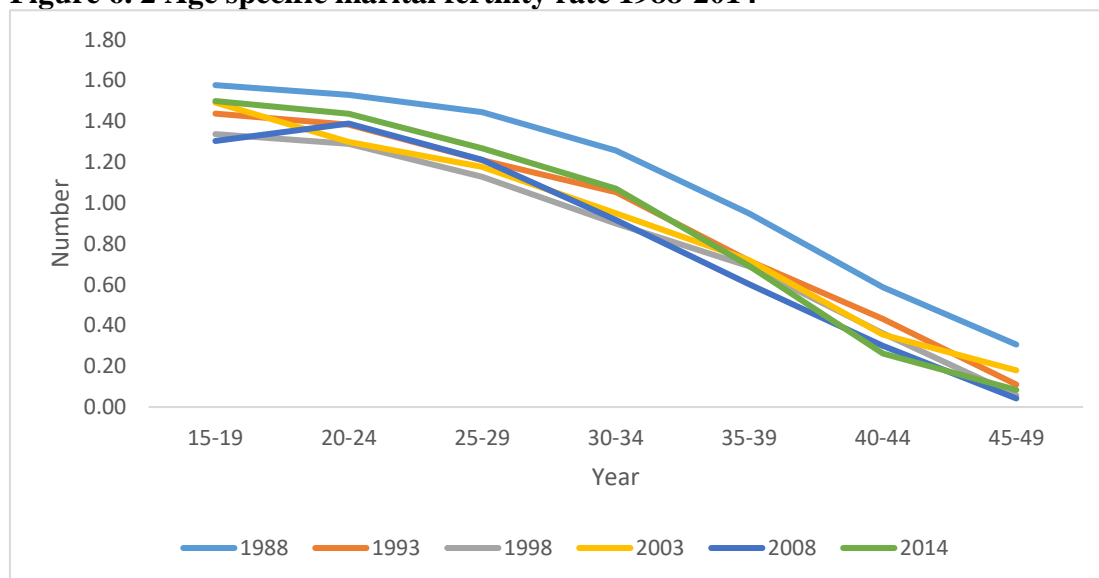


Source: Computed from GDHS 1988, 1993, 1998, 2003, 2008 and 2014

The trends in total ever-marital (TEMFR) and total fertility rates are illustrated in Figure 6.1. It is observed that total marital fertility rates are higher than those of total fertility rates (TFR) for all the survey years shown. It is further observed that both the TFR and TEMFR declined at a faster rate from 1988 to 1998 and thereafter increased until 2003. The increase in TEMFR was fast paced than that of the TFR. The gap between TEMFR and TFR is also observed to have increased over the years. A gap of 1.16 births was observed in 1988 and this was lower than the 2.12 observed in 2014. It is not clear what exactly may be causing this widening gap but it is possible that TEMFR is declining at a faster rate than the TFR and the changes in the never married fertility may have influenced this gap.

Figure 6.2 is an illustration of the age specific marital fertility rate (ASMFR) from 1988 to 2014. It can be observed that ASMFR declined for all age groups from 1988 to 2014. In 1988 for instance an ASMFR of 0.304 was recorded for women aged 20-24 but this declined to 0.287 in 2014, an indication that couples may be controlling fertility within marriages in recent times. The decline, however, was not consistent across the years.

Figure 6. 2 Age specific marital fertility rate 1988-2014



Source: Computed from GDHS 1988, 1993, 1998, 2003, 2008 and 2014

A case in point can be found with the age group 30-34 for which ASMFR declined from 0.251 in 1988 to 0.180 in 1998 and thereafter increased in 2003 to 0.190. Similar fluctuations were observed for the other age groups. The most rapid decline in ASMFR was observed for the age group 45-49 for whose ASMFR declined by seven percent between 1988 and 2014. It is not clear what may have caused this rapid decline. The possibility may be that older married women may be adopting efficient contraceptives to either stop or space childbirth. It is also possible that the women may have understood the health implications of late childbearing and are therefore avoiding more pregnancies. Pregnant women over the age of 34 have been reported to be more susceptible to higher risk of a poor obstetric outcome (Ozalp, et al, 2003).

The percent contribution of each age group to total marital fertility rate is shown in Table 6.1. The data further indicates that childbearing among married women is early. Marital fertility was highest for the adolescent wives aged 15-19 relative to the other age groups. Married women aged 15-19 contributed the highest proportion to TEMFR for all the survey years. In 2014, about one out of every four TEMFR could be attributed to teenage wives. Cumulatively, almost half of all TEMFR had occurred before age 25. Early childbearing may have implications for higher fertility.

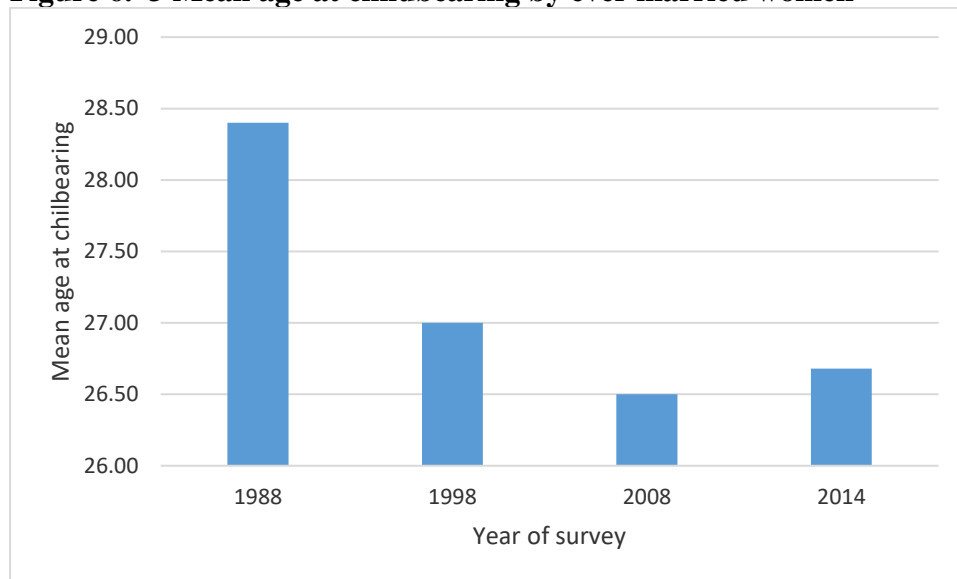
Table 6. 1 Percent distribution in age to TEMFR

Ages	1988	1998	2008	2014
15-19	20.95	24.83	23.96	24.85
20-24	19.92	22.21	23.91	22.45
25-29	18.81	19.41	20.85	19.79
30-34	16.36	15.47	15.78	16.71
35-39	12.34	11.86	10.33	10.79
40-44	7.63	6.21	5.17	4.09
45-49	3.99	0.00	0.00	1.31
	100.00	100.00	100.00	100.00

Source: Computed from GDHS 1988, 1998, 2008 and 2014

The tempo of marital fertility as indicated by the mean age at childbearing is illustrated in Figure 6.3. The mean age at childbearing (MACB) declined from 28.4 years in 1988 to 26.7 in 2014. The expectation was that increases in timing of marriages and median age at first marriage reported in the GDHS and observed in chapter five of this study would have resulted in a lower mean age at childbearing but quite the reverse is happening in Ghana.

Figure 6. 3 Mean age at childbearing by ever married women



Source: Computed from GDHS 1988, 1998, 2008 and 2014

The afore mentioned observation confirms some of the features of the African exceptionalism (Bongaarts, 2017) which is a cause of concern for the stagnation in decline of TFR. Africa's unique fertility transition is related to higher demand for children as a result of deep seated social structures that projects pro-natalism (Bongaarts, 2017; Casterline, 2017). Whilst the timing of marriages increased over the years, the timing of childbearing rather decreased.

The variations in the ever married fertility rates were further examined based on the socio demographic conditions of the women from 1988 to 2014. Table 6.2 shows the trend and differentials in ever married fertility. The last column of the table illustrates percentage change in total ever married fertility rates between 1988 and 2014 for each variable.

Table 6.2 Trends and differentials in ever married fertility rates

Variable	1988	1998	2008	2014	% Change
Educational attainment					
No education	7.88	6.85	7.03	7.03	-12.09
Primary	7.28	6.05	5.81	5.81	-25.30
Middle/JHS	7.48	4.91	5.09	5.09	-46.95
Secondary/Higher	5.84	4.87	4.32	4.32	-35.19
Place of Residence					
Urban	6.83	4.47	4.90	5.63	-21.31
Rural	8.05	6.39	6.29	6.89	-16.84
Religious affiliation					
Catholic	7.67	5.60	5.38	6.01	-27.62
Other Christian	7.30	5.48	5.25	6.02	-21.26
Moslem	8.13	6.54	7.29	7.08	-14.83
Traditional	8.59	6.14	6.99	8.82	2.61
No religion	7.89	6.49	7.72	7.56	-4.37
Ethnicity					
Akan	7.46	5.56	5.37	5.92	-26.01
Ga	7.41	5.41	4.76	4.69	-58.00
Ewe	7.90	5.40	5.60	6.86	-15.16
Guan	7.02	5.67	5.83	4.30	-63.26
Mole Dagbani	7.75	6.53	6.48	6.74	-14.99
Other Ethnic	8.21	6.68	7.06	7.71	-6.49
Marriage Type					
Monogamous	7.99	6.13	5.93	6.68	-19.61
Polygynous	8.13	6.14	7.04	7.28	-11.68
Contraceptive Use					
Never used	7.76	6.11	6.23	6.60	-17.58
Ever used	7.45	5.43	5.35	6.08	-22.53

Source: Computed using TFR2 by researcher from GDHS 1988, 1998, 2008 and 2014

Evidence from the table indicates that for all the survey years, women with no formal education had the highest total marital fertility rate. In 1998 for instance, the marital fertility rate for women without formal education was 6.84 births. On the other hand, women with secondary education had the lowest TMFR of 4.87 births and this was consistent across the years. Thus, women with secondary education and higher were observed to have had the lowest marital fertility.

Surprisingly, the fertility of the women with Middle/ J.H.S. educational level on the other hand was found to be higher in 1988 than that of those with primary education. Nonetheless, it emerged from the data that higher levels of education are mostly associated with lower fertility in ever married women. This suggests the influence of longer periods of schooling, which may have shortened the reproductive lifespan of the women. The highly educated women may have postponed their marriage and or childbearing to pursue higher education. This observation is confirmed by some studies in Ghana and Sub-Saharan Africa (Bongaarts, Mensch, & Blanc, 2017; Chola & Michelo, 2016a; Tawiah, 1984). The principles of the classical demographic transition model which stipulates that improvement in socio-economic conditions results in lower fertility is further supported in this study.

The pace of decline in marital fertility on the other hand was observed to be slowest for women with no formal education, a decline of just about 12 percent was observed between 1988 and 2014. The total marital fertility rate showed a slight increase for this category of women from 1998 to 2008. The greatest decline, on the other hand, was observed for the women with middle or J.H.S education.

As expected, marital fertility was higher for women living in rural areas than urban areas. Similar observations were made about four decades ago where the fertility for all urban areas was 5.78 compared to 6.85 for rural women in 1975 (Shah & Singh, 1985). This observation, has often been a characteristic of most fertility studies in Sub-Sahara Africa. The decline in fertility was faster for urban women (-21%) than for rural women (17%). Similar paces of decline have been observed in a previous study in Ghana (Shah & Singh, 1985). Urban areas, according to Shah and Singh (1985), place more constraints on childbearing. Housing, childcare and education for children may be expensive enough to deter women from having larger family sizes. Diffusion of ideas on fertility control is most likely to be faster in urban

areas than in rural areas. This pattern also conforms to what has been observed in some SSA countries (Chola & Michelo, 2016a; Kabagenyi et al., 2015).

The data further indicates fertility to have declined across all the religious affiliations. The largest was observed for Catholics with a decline of about 27 percent between 1998 and 2014. For most of the survey years, Christians, especially non-Catholics, were observed to have had the lowest marital fertility. Catholics are known for their stronger stance against the use of modern contraceptives than their non-Catholic counterparts, therefore, it is likely the control of marital fertility may be more acceptable among the non-Catholic Christians than the Catholics. It was observed that fertility for the adherents of traditional religion and that for women with no religion was the highest for most of the survey years. This could be because adherents of traditional religion have strong pro-natalist norms to sustain this high fertility.

With regards to ethnicity, the largest and the most consistent decline was observed among the Ga women with a decline of about 58 percent. This could be because the Gas living in the Greater Accra region where urbanisation is highest may have had a closer contact with modernisation and a faster diffusion of ideas on birth control than the other ethnic groups. This is evidenced by the fact the Gas for all the survey years had the lowest total fertility rate. The high TEMFR as observed for the Mole Dagbani fits well into the observations by Shah and Singh (1985). In their study, they suggested links of the high fertility among this group to their strong beliefs in the Moslem and traditional religions.

The influence of polygyny on fertility is another area that calls for attention when fertility transition in Ghana is being examined. It has been hypothesized that polygyny has a depressing effect on fertility (Aryee, 1985; Cahu et al., 2014; Solène Lardoux & Van de Walle, 2003; Timæus & Reynar, 1998). It is, therefore, expected that women in monogamous marriages will have a higher fertility than those in polygynous marriages, possibly because those in monogamous unions have more continuous exposure to the risk of childbearing. In contrast,

societies where women compete for the resources of their husband, number of children is paramount in determining the status of woman. Women then, have a tendency to have a higher number of children. It is therefore useful to examine fertility differential by types of union and also observe if any changes in trends have occurred over the time period under study.

The data in Table 6.2 supports the fact that women in polygynous marriages have higher fertility than those in monogamous marriages. For instance, in 1988, whereas a TFR of 8.13 was recorded for polygynous wives, it was 7.99 for their monogamous counterparts. Similarly, in 2014, a TFR of 7.28 was observed for polygynous wives and this was also higher than the 6.68 for monogamous wives.

It has been suggested that women in polygynous relationships compete with their co-wives for their husband's resources. It is this competition among co-wives that in part triggers fertility contagion to result in higher fertility among polygynous wives. Besides, prevalence of polygyny is associated with higher number of remarriages, each of which is linked to new childbearing experiences. Hence, with the decline in polygyny, it is most likely its contribution to the fertility reduction in Ghana will become stronger.

6.3 Trends and differentials in marital fertility rates by timing of marriage

Table 6.4 illustrates the differentials in total marital fertility rates by the timing of first marriage according to the socio-demographic variables.

Table 6.3 Total ever marital fertility rates by the timing of first marriages and socio-demographic variables from 1988-2014

Survey year								
Variables	1988		1998		2008		3014	
	Early	Delayed	Early	Delayed	Early	Delayed	Early	Delayed
Education								
No education	7.52	7.58	6.38	6.05	6.72	5.93	6.69	6.42
Primary	6.93	6.92	5.88	4.93	5.69	4.87	6.06	5.48
Middle/JHS	7.10	6.65	4.73	3.99	4.72	4.47	5.70	4.96
Secondary+	5.90	4.31	3.82	4.08	4.37	3.32	3.56	4.33
Residence								
Urban	6.68	5.75	4.07	3.73	4.71	3.93	5.12	4.82
Rural	7.65	7.67	6.11	5.44	6.00	5.52	6.44	5.99
Religious								
Catholic	7.45	6.48	5.40	4.60	5.36	3.87	5.79	4.54
Other Christian	6.97	6.76	5.29	4.39	5.01	4.46	5.56	5.03
Moslem	7.98	7.11	6.04	6.16	7.07	6.19	6.54	6.43
Traditional	8.12	8.21	5.65	6.27	6.79	5.60	8.43	7.25
No religion	7.59	7.18	5.81	5.86	7.15	7.28	7.08	6.75
Ethnicity								
Akan	7.12	7.02	5.25	4.73	5.15	4.50	5.49	5.04
Ga	7.49	5.31	5.33	3.62	4.27	4.16	3.66	4.75
Ewe	7.33	7.46	5.18	4.36	5.38	4.65	6.36	5.25
Guan	6.70	9.27	5.82	4.05	5.78	4.77	3.83	5.16
Mole Dagbani	7.50	7.00	5.99	6.06	6.49	5.32	6.29	6.18
Other Ethnic	8.09	7.28	6.41	5.85	6.79	5.89	7.39	6.08
Marriage type								
Monogamy	7.74	7.02	5.82	5.21	5.73	4.84	6.29	5.56
Polygyny	7.66	8.08	6.00	4.91	6.96	5.33	6.85	6.07
Contraception								
Never used	7.37	7.24	5.89	4.81	6.27	4.88	6.15	5.52
Ever used	7.25	6.47	5.15	4.78	5.10	4.53	5.73	5.08

Computed from GDHS 1988, 1998, 2008 and 2014

It was expected that women of all levels of education who delayed their marriage would have lower fertility rates relative to those who married early though this expectation only occurred with women with lower educational levels. In 1998 and 2014, women with secondary education who had delayed their marriage were observed to have had higher fertility relative to those who married earlier. TFR for a woman with secondary education was 4.33 compared to the 3.56 of those who married early. This may be evidence of the late ‘catch up’ effect of delayed marriage (MacQuarrie, 2016; Odimegwu & Zerai, 1996). These women with higher levels of education may have given birth in quick succession to make-up for the reproductive period that was lost to longer duration of schooling. The implication may be that higher age at first marriage may not always result in lower fertility for women with higher education.

The urban-rural variation in marital fertility rate became more evident when the timing of first marriage was differentiated. Women who delayed their first marriage and were living in urban areas had the lowest fertility relative to those who lived in rural areas. Similar trends and patterns were observed across the other socio-demographic variables. From all indications delayed marriage had a mitigating effect on fertility.

Table 6.4 Total ever marital fertility rates by the timing of first marriages, educational levels, and contraceptive use from 1988-2014

		Survey year							
		1988		1998		2008		2014	
	Marriage timing	Early	Delayed	Early	Delayed	Early	Delayed	Early	Delayed
Highest education	Contraception								
	never used	7.49	7.75	6.28	6.09	7.04	6.24	6.89	6.77
No education	ever used	7.60	6.88	6.63	5.84	6.17	5.48	6.48	5.82
	never used	6.50	6.44	6.46	4.27	6.13	5.59	6.31	5.13
Primary	ever used	7.40	8.62	5.35	5.66	5.44	5.90	5.66	5.68
	never used	7.02	6.90	4.91	3.68	5.05	4.42	5.03	5.30
Middle/JHS	ever used	7.16	6.34	4.67	4.11	4.60	4.55	6.06	4.75
	never used	8.86	4.17	3.95	3.35	5.69	2.89	4.01	4.21
Secondary+	ever used	5.01	4.50	3.71	4.39	4.05	3.41	3.44	4.40

Computed from GDHS 1988, 1998, 2008 and 2014

The association between educational attainment, marriage timing, contraceptive use, and marital fertility was explored in Table 6.5. The data indicate that at almost all the levels of education, women who had ever used contraceptives had lower fertility than those who never used them.

6.4 The influence of first marriage timing on marital fertility

The influence of the socio-demographic variable on ever married fertility has been described in the previous section. This section further uses rate ratio in a multivariate analysis to identify factors associated with ever married fertility (Schoumaker, 2013). The rate ratios for the socio-demographic variables show the exponential of the regression coefficients of the independent variables in a Poisson Regression, and are interpreted as the ratios of the TFR. The rate ratios will therefore represent the ratio of the TFRs for the covariates as compared to the reference category, delayed marriages. The main independent variable, timing of first marriages, was used as the reference category (RC). This was coded zero if it occurred at age 20 and above, and categorized as later but coded one if otherwise. Age-specific fertility rates and TFRs were computed for the reference category, and the rate ratios were displayed for the other categories of marriage timing (earlier marriages) in the first model. All the covariates were categorical in nature and age-specific fertility rates were calculated for the respective reference categories and rate ratios of the other variables in the second model (Kabagenyi et al., 2015). These calculations were performed using Stata model TFR2. The fertility of married women by the timing of their first marriage is shown in Table 6.5

Table 6. 5 Timing of first marriages and total ever marital fertility rates 1988-2014

Timing of Marriage	1988	1998	2008	2014
Early	7.34	5.49	5.58	5.91
Delayed	6.95	4.80	4.69	5.27

Source: Computed from GDHS 1988, 1998, 2008 and 2014

From Table 6.5, it is observed that women who married early had higher fertility than women who married late. In 1988, for instance, the total fertility of women who married later was 6.95 as compared to 7.34 for women who married early. Table 6.4 illustrates the influence of the timing of first marriages on marital fertility.

Three models were fitted to examine the influence of timing of marriage on marital fertility. The first model (Table 6.6) included marriage timing as the only explanatory variable. In the second model (Table 6.7), educational level and contraceptive use were added to marriage timing to observe the net effect of marriage timing on marital fertility. Using the three-stage analysis provided a deeper understanding of the independent contribution of each set of predictor variables as the model is subsequently fitted.

Tables 6.6 and 6.7 show the results for models 2 and 3. In model 2, the rate ratio of women who delayed their marriage relative to those who married early reduced when the level of education and contraceptive use were controlled. The association was, however, significant in 1998 and 2014. The implication is that the net effect of marriage timing on marital fertility became more significant and stronger when these two other variables were introduced into the model for 1998 and 2014. In 1998, the effect of marriage timing on fertility was not significant in model 1 but it was observed to be a significant predictor in model 2. Moreover, the strongest effect is observed in 2014 in model 2. Evidence from model 2 shows secondary education as the strongest and the most consistent predictor of marital fertility. In 2014, a rate ratio of 0.64 is observed for women with a secondary education compared to women with no formal education. This means that the fertility of women with secondary education is 36 percent lower than that of women with no education. Similarly, the fertility of women with Middle/JSS level of education was 23 percent lower than women with no education in 2014. This confirms the hypothesis that higher levels of education has the effect of reducing marital fertility rate. Contraceptive use, on the contrary, is not a significant predictor in this model.

Table 6.6 Fertility rates and rate ratios by timing of marriage for the three years preceding the survey, Ghana, 1988-2014 DHS (Model 1)

	1988		1998		2008		2014	
	ASFR	95% C.I	ASFR	95% C.I	ASFR	95% C.I	ASFR	95% C.I
15-19	0.27	0.22-0.32	0.23	0.18-0.27	0.21	0.16-0.26	0.28	0.23-0.33
20-24	0.30	0.27-0.33	0.25	0.22-0.28	0.25	0.22-0.28	0.27	0.25-0.30
25-29	0.29	0.27-0.32	0.23	0.20-0.25	0.23	0.21-0.26	0.25	0.23-0.27
30-34	0.26	0.23-0.29	0.18	0.16-0.21	0.18	0.16-0.20	0.22	0.20-0.24
35-39	0.19	0.17-0.22	0.14	0.12-0.16	0.12	0.10-0.14	0.14	0.13-0.16
40-44	0.12	0.10-0.14	0.08	0.06-0.09	0.06	0.05-0.07	0.05	0.05-0.06
45-49	0.06	0.04-0.08	0.01	0.00-0.02	0.01	0.00-0.01	0.02	0.01-0.02
TFR	7.49		5.59		5.28		6.18	
Variable	Rate ratios of explanatory variables - Assumption of constant age fertility schedule							
	ASFR and TFR for the reference category is zero							
Marriage timing								
Delayed (RC)	1.00		1.00		1.000		1.000	
Early	0.96		0.95		1.02		0.93**	

Note: * p<.1; ** p<.05; *** p<.01.

Source: Computed from GDHS 1988, 1998, 2008 and 2014

Using women who married late as the reference category to examine the net effect of marriage timing on total fertility in the three years preceding each survey, it was observed that age at marriage alone was not a statistically significant predictor of total fertility in 1988 and subsequent surveys until 2014 (model 1). The results in 2014 indicate that the fertility of women who married early was about seven percent (rate ratio of 0.93) lower than those who married late and that was statistically significant. In 2008, the fertility of the women who

married early was 1.02 times higher than those who married late. This however, was not statistically significant.

Table 6.7 Fertility rates and rate ratios by timing of marriage, educational level and contraceptive use 1988-2014 DHS (Model 2)

YEAR	1988	1998	2008	2014
TFR (95% Conf.Interval)	7.94 (7.16-8.71)	6.70 (5.97-7.44)	7.17 (6.28-8.06)	8.04 (7.28-8.79)
Rate ratios of explanatory variable				
Marriage timing				
Delayed (RC)	1.00	1.00	1.00	1.00
Early	0.94	0.91*	0.93	0.85***
Educational level				
No Education (RC)	1.00	1.00	1.00	1.00
Primary	0.94	0.90*	0.85**	0.84***
Middle/JSS	0.95	0.72***	0.68***	0.77***
Secondary +	0.72***	0.64***	0.56***	0.64***
Contraceptive use				
Never use (RC)	1.00	1.00	1.00	1.00
Ever use	1.02	1.05	0.97	0.98

Note: * p<.1; ** p<.05; *** p<.01.

Source: Computed from GDHS 1988, 1998, 2008 and 2014

The net effect of marriage timing, after controlling for educational level, place of residence, religious affiliation, ethnicity, type of marriage (polygyny or monogamy) was examined in a third model. The results are shown in Table 6.8

Table 6. 8 Total fertility rates and rate ratios by timing of marriages and selected covariates for the three years preceding the survey, Ghana 1988-2014 DHS (model 3)

Variable	1988		1998		2008		2014	
	Coef.	95% C.I.	Coef.	95 % CI	Coef.	95 % CI	Coef.	95 % CI
Age group								
15-19	0.25	0.19-0.32	0.19	0.14-0.25	0.21	0.14-0.29	0.28	0.20-0.35
20-24	0.28	0.23-0.34	0.23	0.18-0.29	0.26	0.19-0.33	0.29	0.23-0.34
25-29	0.28	0.23-0.34	0.22	0.17-0.27	0.25	0.19-0.32	0.28	0.23-0.33
30-34	0.25	0.20-0.30	0.18	0.10-0.27	0.20	0.15-0.25	0.25	0.20-0.29
35-39	0.20	0.16-0.24	0.14	0.11-0.18	0.13	0.10-0.17	0.16	0.13-0.19
40-44	0.13	0.10-0.17	0.07	0.05-0.09	0.07	0.05-0.09	0.07	0.05-0.08
45-49	0.07	0.04-0.09	0.01	0.00-0.02	0.01	0.00-0.02	0.02	0.01-0.03
TFR	7.31	6.00-8.63	5.27	4.11-6.44	5.68	4.27-7.10	6.69	5.47-7.90
ASFRs and TFR for the reference category is zero								
Rate ratios of explanatory variables-Assumption of constant age fertility schedule								
Variable	Rate ratios		Rate ratios		Rate ratios		Rate ratios	
Marriage timing								
Delayed (RC)	1.00		1.00		1.00		1.00	
Early marriage	0.96		0.93		0.93		0.87***	
Education								
No Education (RC)	1.00		1.00		1.00		1.00	
Primary	0.98		0.98		0.93		0.91*	
Middle/JSS	1.00		0.82***		0.79***		0.90*	
Secondary +	0.80**		0.77**		0.66***		0.72***	
Place of residence								
Urban (RC)	1.00		1.00		1.00		1.00	
Rural	1.12**		1.33***		1.17**		1.15***	
Religion								
Catholic (RC)	1.00		1.00		1.00		1.00	

Other Christian	1.00	0.99	1.07	1.07
Moslem	1.10	1.09	1.23**	1.17**
Traditional	1.12	1.03	1.07	1.4***
No religion	1.03	1.11	1.31*	1.17
Ethnicity				
Akan (RC)	1.00	1.00	1.00	1.00
Ga	0.98	0.98	0.76*	0.91
Ewe	0.96	0.92	1.00	0.97
Guan	1.02	0.99	1.03	0.94
Mole Dagbani	0.90	0.87	0.97	1.00
Other Eth	1.00	1.00	1.05	1.01
Marriage Type				
Monogamy (RC)	1.00	1.00	1.00	1.00
Polygyny	1.01	0.94	1.04	0.94
Contraceptive use				
Never used	1.00	1.00	1.00	1.00
Ever used	1.03	1.09*	0.99	0.96

Note: * p<.1; ** p<.05; *** p<.01

Source: Computed from GDHS 1988, 1998, 2008 and 2014

In the third model (Table 6.8), place of residence was observed as a consistently significant predictor of marital fertility. In 1988, women residing in rural areas had a rate ratio of 1.12 times of the fertility of women in urban areas, and in 1998, it was 1.33 times of the fertility of the women in urban areas. This is an indication that controlling for age at marriage, women in rural areas have a higher incidence of higher fertility than women in urban areas.

The effect of secondary and higher level of education on marital fertility was observed in the study, (Table 6.8). For each of the survey years, women with higher educational level had the lowest rate ratio when compared with women without any formal education. In 1988, the total fertility of women with secondary education was about 80 percent of the TFR of the women without any formal education when age at first marriage was controlled. In 1998, it was 82 percent. Similar trends were observed across the survey years. The hypothesis that higher levels of education could lead to a reduction in the total fertility rate of ever married women is, thus, confirmed in the study. For instance, in 2014 women with Middle/JSS level of education had a rate ratio of 0.90 times of the women without any formal education, but this was higher when compared with women with secondary education whose ratio was 0.72 times of the women without formal education.

Religious affiliations, ethnicity and type of marriage were not consistent predictors in the multivariate analysis.

The net effect of age at first marriage on fertility in Ghana, controlling for the selected variables, was negligible in 1988 and was still not statistically significant. Women who married late had a TFR which was about four percent lower than that of women who married early in the model in which age at marriage was the only independent variable. However, when all the other variables were included, age at marriage was still not significant and the rate ratio remained almost the same.

Across the survey years, it was only in 2014 that age at first marriage was statistically and significantly associated with total fertility rate when other variables were controlled.

In that year, the women who married late had a TFR which was 13 percent lower (1-0.87) than the women who married early. This in effect shows the influence of the covariates on the net effect of marriage timing in reducing total fertility rate.

Therefore, the net effect of the timing of first marriage on total marital fertility in the three years preceding the survey diminished when the other covariates were controlled. Age at first marriage became a stronger and significant predictor of fertility. This, however, occurred only in 2014, contrary to the other survey years.

6.5 Concluding remarks

Marital fertility was observed to have declined over the survey period. Differentials showed that TEMFR varied by the various socio-demographic characteristics of the women. The findings from the discussions have revealed that the socio-demographic variables played an important role in the changes in the marital fertility rates. Evidence from the study is consistent with the demographic transition theory that relates declines in fertility to modernization. It emerged from the discussions that married women with the highest levels of education had the lowest fertility rates. In the context of the second demographic transition, it is argued that fertility levels are influenced by the spread of some ideational changes that inspire women to have smaller number of children (Weeks, Getis, Hill, Agyei-Mensah, & Rain, 2010). Thus improved access to formal education has been an important tool for a reduction in desired family size and unexpected pregnancies (Bongaarts, 2010). Formal education also provides an opportunity for women to pursue careers in the formal sector so that they will not be just satisfied with their traditional roles just being a mother and wife.

The declines in the mean age at childbearing since 1988, however, suggest that married women prefer to give birth at the early ages of their reproductive lives. Thus delays in marriage may not necessarily mean delays in childbearing in Ghana. Early age at childbearing will further provide a longer period of exposure to the risk of conception in Ghana where contraceptive use is low.

Age at marriage was not a significant determinant of marital fertility. This was contrary to expectations from previous studies that highlighted significant reductions in fertility with increasing age at marriage. At the bivariate level, women who married late had lower fertility than those who married early. However, when the covariates were controlled, age at marriage was not significantly associated with fertility rate. The late 'catch up' effect has appeared in previous literature with women who married later giving birth in quick succession to make up for the lost reproductive period before marriage (MacQuarrie, 2016; Odimegwu & Zerai, 1996). In effect, efforts to encourage women to postpone marriage may not necessarily lead to a reduction in fertility.

CHAPTER SEVEN

LEVELS, TRENDS AND DIFFERENTIALS IN NEVER MARRIED

FERTILITY

7.1 Introduction

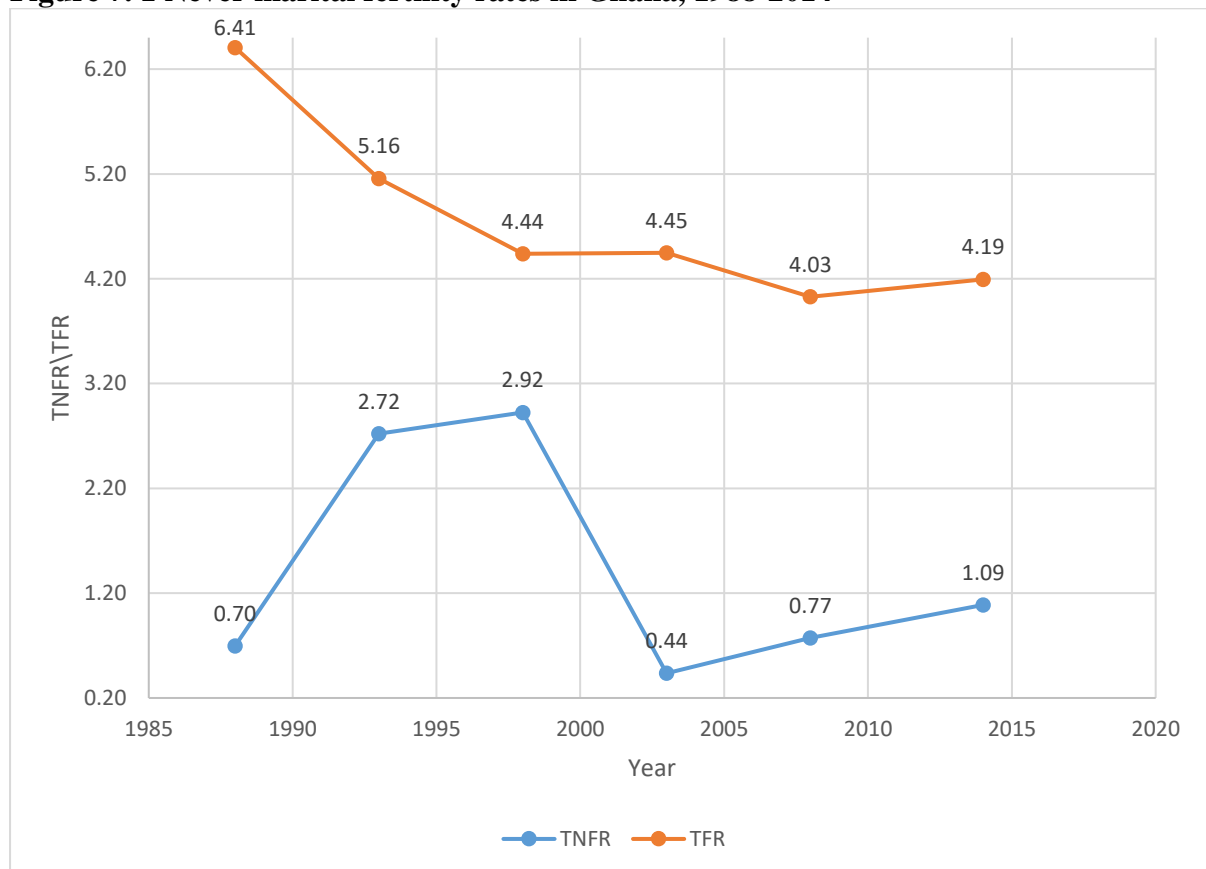
Previous studies in SSA have linked the high TFR to a nearly universal age at marriage. Meanwhile, recent trends point to delays in the transition toward first marriage. As a result, a higher proportion of never married women is gradually emerging. Yet the contribution of the never married to the recent fertility transition has not received much attention by way of research because of the assumption that fertility is mostly confined to ever married women. Some studies have concentrated on adolescent fertility due to its association with various poor social, health and economic outcomes for both the mother and the child. Adolescent childbearing in itself is a major concern since most of the childbearing occurs within the early years of the marriage. An equally curious situation is that of the never married adult mother. Hence, in view of the dire consequences and social stigma attached to births to the never married, it has become more important to have a clear understanding of the fertility patterns of women who never married in order to design pragmatic interventions to sustain the fertility decline in SSA.

With the increasing delays in the transition to first marriage, accompanied by a decline in child marriage, it is important to track the fertility of never married women of different ages. It is still not clear if the decline in fertility is attributed to delays in the transition to first marriage, changes in marital fertility or decline in never married fertility. This chapter, therefore, is an attempt to clarify this gap in knowledge by describing the levels and trends in never married fertility from 1988 to 2014.

7.2 Never married fertility: levels and trends from 1988-2014

Figure 7.1 shows the trend in total never marital fertility rate (TNFR) and total fertility rates (TFRs) for Ghana during the period 1988 to 2014. From Figure 7.1, the total never marital fertility rate (TNFR) increased from 0.7 in 1988 to its peak of 2.9 in 1998, recorded a very sharp drop in 2003 and is thereafter showing some consistent increase.

Figure 7. 1 Never marital fertility rates in Ghana, 1988-2014



Source: Computed from GDHS 1988, 1993, 1998, 2003, 2008 and 2014

It is also evident from the year 2003 that the gap between TNFR and the TFR is narrowing. A gap of about four births was observed in 2003 but this reduced to three in 2014. Suggestively, the change in TNFR is faster than that of TFR. Hence, it is possible that births to unmarried women are gradually becoming more acceptable in Ghana.

The changes in age specific never marital fertility rates (ASNFR) and the contribution to TNFR in percentages by each age group are shown in Table 7.1 and 7.2. The data show that the age

specific never marital fertility rates were concentrated mainly within the 15-29 age group. For most of the years, the highest ASNFR was observed for the 20-24 year group. In 1988, about 50 percent of TNFR was contributed by this age group. Indications are that most births to the never married occur in the age group 20-24 (Table 7.2). A decline in ASNFR occurred across age groups younger than 30. However, ASNFR shows some increases for women aged 30-39 years from 2003 onwards. This may suggest that older women who may have deferred marriage are now giving birth prior to their first marriage. In the year 2003, women aged 35-39 years contributed about 30 percent to the TNFR (Table 7.2). The year 1998 looks exceptional due to an unusually high ASNFR within 40-44. It is also observed that the ASNFR among adolescents is increasing (Table 7.1) and this needs further investigations.

Table 7. 1 Age specific never marital fertility rates

ASNFR	1988	1993	1998	2003	2008	2014
15-19	0.142	0.125	0.071	0.089	0.139	0.196
20-24	0.342	0.116	0.157	0.164	0.215	0.238
25-29	0.214	0.148	0.051	0.023	0.161	0.220
30-34	0.000	0.000	0.000	0.036	0.129	0.146
35-39	0.000	0.619	0.000	0.123	0.128	0.212
40-44	0.000	1.714	2.646	0.000	0.000	0.076
45-49	0.000	0.000	0.000	0.000	0.000	0.000
TNFR	0.697	2.722	2.924	0.436	0.772	1.087

Source: Computed from GDHS 1988, 1993, 1998, 2003, 2008 and 2014

Table 7. 2 Percent contribution to TNFR by age

Ages	1988	1998	2003	2008	2014
15-19	20.32	2.42	20.46	17.95	18.02
20-24	48.99	5.36	37.70	27.79	21.90
25-29	30.70	1.73	5.39	20.86	20.19
30-34	0.00	0.00	8.16	16.76	13.40
35-39	0.00	0.00	28.29	16.65	19.49
40-44	0.00	90.49	0.00	0.00	7.00
45-49	0.00	0.00	0.00	0.00	0.00

Source: Computed from GDHS 1988, 1998, 2003, 2008 and 2014

The age specific never marital fertility rates (Table 7.1) were concentrated mainly within the 15-29 age group and the trends are illustrated in Figure 7.2. However, variations also were observed across the survey period. For most of the year, the highest ASNFR was observed for the 20-24 year group. In 1988, about 50 percent of TNFR was contributed by this age group, indicating that most births occur in the age group 20-24. A decline in ASNFR occurred across the age groups except 1998, which had an unusually high ASNFR within 40-44. It is also observed that the ASNFR among adolescents is increasing (Table 7.1) and this needs further investigations.

7.3 Differentials in total never married fertility rates

The differentials in never marital fertility with regards to the socio-demographic conditions of the women are shown in Table 7.3 and Figure 7.2. The table shows that total never marital fertility rate varied with regards to the educational level of the women. For almost all years, TNFR was higher for women with no education than for women with secondary or higher education (Table 7.3). For instance, in 1988, a TNFR of 1.004 was recorded for women without education as compared to 0.293 for those with secondary and higher education.

Table 7.3 Total never married fertility rates

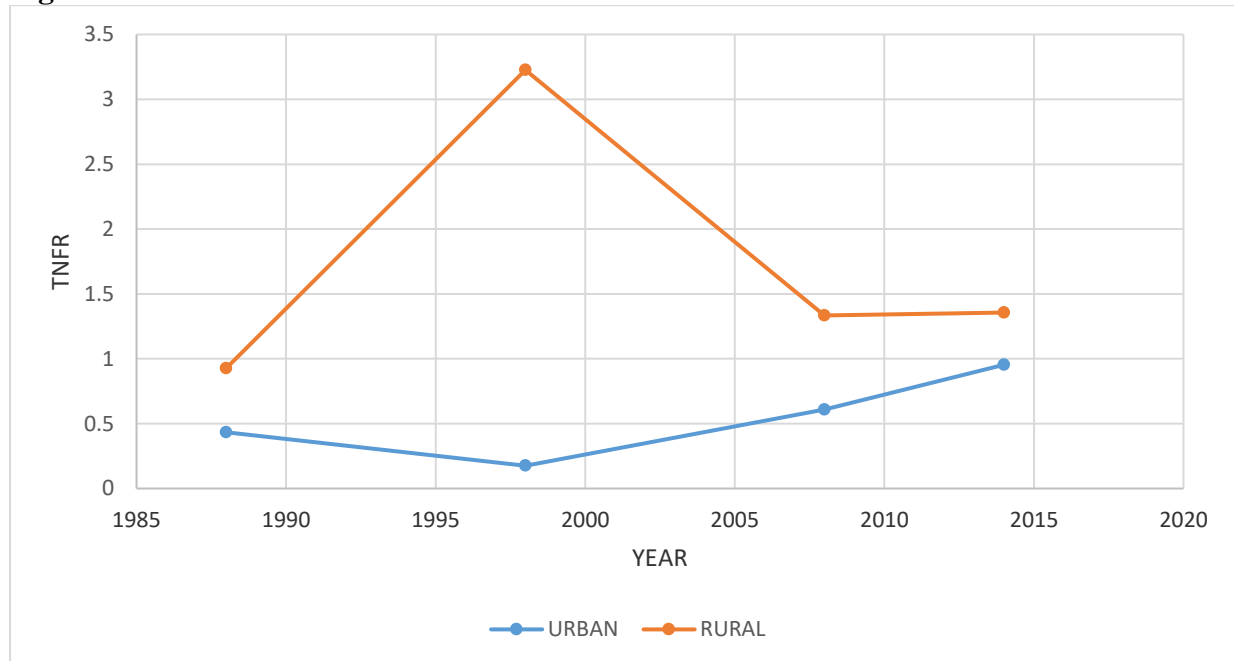
YEAR	1988	1998	2008	2014	% change
Place of Residence					
Urban	0.433	0.176	0.61	0.954	120.3
Rural	0.928	3.226	1.333	1.357	46.2
Educational Level					
No education	1.004	0.658	1.337	1.569	56.3
Primary	1.206	2.746	1.739	1.349	11.9
Middle/JHS	0.648	3.93	0.892	1.447	123.3
Secondary	0.293	0.075	0.109	0.561	91.5
Religious Affiliation					
Catholic	1.051	0.289	0.418	0.922	-12.3
Other Christian	0.558	3.383	0.672	0.894	60.2
Moslem	0.231	0.194	0.557	0.692	199.6
Traditional	0.368	0.115	4.525	5.374	1360.3
No religion	3.025	3.714	3.285	9.087	200.4
Ethnicity					
Akan	0.771	3.884	0.773	1.007	30.6
Ga	0.614	2.492	1.519	1.122	82.7
Ewe	0.8	0.13	0.217	1.185	48.1
Mole Dagbani	0.223	0.072	0.317	0.859	285.2
Other ethnic group	0.353	0.49	2.096	1.77	401.4
Age At First Sex					
<16yrs	0.771	0.729	0.644	1.883	144.2
17-18yrs	1.206	0.307	0.651	1.816	50.6
19+yrs	0.43	2.277	1.166	0.772	79.5
Ever Use of Contraceptives					
Never used	0.613	0.244	1.001	0.795	29.7
Ever use	0.763	2.415	0.817	1.508	97.6

Source: Computed by researcher from GDHS 1988, 1998, 2008 and 2014

Also, the highest TNFR varied across the years. In 1998, a very high TNFR of 3.9 was observed for women with Middle/JSS education, whereas in 2008, it was recorded for the women with primary education. TNFR, though fluctuating, has shown some remarkable increase from 1988-2014 for all the educational levels. The highest increase of 55.2 percent was recorded for

women in the middle/JHS category whilst the lowest of 10.6 percent was recorded for the women with primary education.

Figure 7. 2 Rural urban variations in TNFR



Source: Computed by researcher from GDHS 1988, 1998, 2008 and 2014

The urban rural differentials in TNFR are illustrated in Figure 7.2. It is evident that for almost all the years, TNFR was high for women living in rural areas than it was for those in urban areas (Figure 7.3). In 2014, TNFR was 0.954 for urban women as compared to 1.357 for rural women. The TNFR also showed an increase across the survey years for both rural and urban women. A very rapid increase was recorded between 1988 and 1998, which later dropped in 2008, for the rural women. Moreover, the highest increase of 120 percent from 1988 to 2014 was observed for urban women as compared to only 46 percent for rural women. TNFR was higher for the rural women than for urban women. This is to be expected as high value is mostly placed on children in rural areas than in urban areas. However, since 1998 TNFR for urban women has shown some consistency in increase. Indications are that childbearing before marriage is becoming acceptable in urban areas than for rural areas.

As far as religious affiliations are concerned, the highest TNFR was observed among women with no religion for all the survey years (Table 7.3). For almost every year the highest TNFR was very high for women of no religion. In addition, though a fluctuating trend was observed for the religious affiliation, TNFR also showed an increase from 1988 to 2014. The highest increase was observed for women with traditional religion, which increased from 0.368 to 5.374 between 1988 and 2014. Meanwhile a decline of -13.9 percent was observed for women of the Catholic faith.

7.4 Factors associated with child bearing by never married women in Ghana

The discussions on fertility trends indicated that the total never married fertility for Ghana has been increasing since 2003. Considering the negative social health and psychological outcomes often associated with single motherhood, as well as the increasing proportion of the never married women in Ghana, it has become imperative to examine the likely socio-demographic factors influencing births occurring prior to first marriages for women who had never been married.

This section therefore seeks to use binary logistic to examine the probability that a never married woman chosen at random from the sample of never married women would have given birth or never given birth at the time of survey.

Never married fertility may be distinctly different from pre-marital and non-marital fertility. The term pre-marital fertility has been used to refer to fertility before the first marriage but a currently-married woman may have had some pre-marital births either to the current husband or any other man. This makes the definition of pre-marital fertility unclear and challenging, especially since this currently married woman may or may not be living with the biological father of the child. Studying pre-marital births, therefore, is more complicated as currently

married women may have some pre-marital births. The study is thus restricted to only never married women that have ever given birth.

First, the proportion of ever given birth is described in Table 7.3.

Table 7. 4 Motherhood status of never married women

Year	Motherhood Status	Frequency	Percent
1988	Never given birth	799	89.9
	Ever given birth	90	10.1
1993	Never given birth	824	92.6
	Ever given birth	66	7.4
1998	Never given birth	1070	93.2
	Ever given birth	78	6.8
2003	Never given birth	1485	91.9
	Ever given birth	131	8.1
2008	Never given birth	1402	88
	Ever given birth	192	12
2014	Never given birth	2547	82.3
	Ever given birth	547	17.7

Source: Computed by researcher from GDHS 1988, 1993, 1998, 2003, 2008 and 2014

From Table 7.4, it is quite clear that the proportion of never married women that have ever given birth has been increasing since 1998. In 1998, only 6.8 percent had ever given birth but this proportion increased to 17.7 in 2014. It is not clear if women are using their fertility status to negotiate marriage with potential spouses or that motherhood is becoming more attractive than being a wife and hence making women who are delaying their marriage now resort to giving birth. In this case, childbearing could be part of a sequence of events leading to marriage. The socio-demographic determinants of the motherhood status of never married women need further clarification.

A binary logistic regression model is used to predict the probability that a never married woman chosen at random would have ever given birth or never given birth. The outcome variable ever given birth status was coded (1) if the woman has at least one birth whilst those who had never given birth were coded (0). The null hypothesis that the explanatory variables in the model will not significantly predict if a never married woman would have ever given birth or otherwise was tested. The chi-square test of goodness fit was used to explore the reliability of the model. The model summary for each year is described (See Table 7.5). Table 7.5 shows results using the omnibus tests of model coefficient. The 1988 model indicates a degree of freedom of 17 related to a chi-squared value of 153.034. The observed p-value of 0.000 was less than 0.05. Therefore, it can be concluded that at five percent significance level the null hypothesis can be rejected. The indications are that including the explanatory variables will significantly influence the odds of predicting if a never married woman has ever given birth or otherwise. The results of the binary logistics are displayed in Table 7.5.

Table 7.5 Binary logistic regression of ever given birth status among never married women of 15-49 years, Ghana-1988-2014

	1988			1998			2008			2014		
	Exp(B)	95% C.I. for EXP(B)		Exp(B)	95% C.I. for EXP(B)		Exp(B)	95% C.I. for EXP(B)		Exp(B)	95% C.I. for EXP(B)	
		Lower	Upper		Lower	Upper		Lower	Upper		Lower	Upper
Place of residence												
Urban	1.00			1.00			1.00			1.00		
Rural	2.32**	1.28	4.24	1.51	0.81	2.81	1.23	0.82	1.83	1.34**	1.05	1.70
Education												
No education	1.00			1.00			1.00			1.00		
Primary	2.93**	1.19	7.21	1.71	0.68	4.26	1.29	0.54	3.10	1.09	0.62	1.93
Middle/JSS	0.99	0.44	2.25	0.48	0.20	1.19	0.59	0.26	1.33	0.81	0.48	1.37
Secondary +	0.22**	0.64	0.75	0.45	0.16	1.31	0.20***	0.08	0.45	0.24***	0.14	0.41
Ethnicity												
Akan	1.00			1.00			1.00			1.00		
Ga-Adangbe	1.57	0.75	3.29	0.45	0.15	1.37	0.49**	0.21	0.94	0.85	0.55	1.30
Ewe	0.42**	0.19	0.90	0.67	0.30	1.17	0.37**	0.18	0.77	0.88	0.64	1.21
Guan	0.13	0.09	1.94	4.88	0.45	56.19	1.25**	0.35	4.43	0.70	0.31	1.58
Mole-Dagbani	1.43	0.11	18.40	0.99	0.20	5.06	1.48	0.76	2.85	0.60**	0.39	0.94
Other	0.09	0.05	1.74	1.02	0.35	2.92	0.68	0.33	1.38	0.77	0.48	1.24
Religion												
Catholic	1.00			1.00			1.00			1.00		
Other Christian	1.10	0.53	2.28	1.21	0.48	3.09	1.40	0.71	2.75	1.19	0.81	1.77
Moslem	4.12	0.32	53.13	0.99	0.27	3.55	1.68	0.75	3.77	1.24	0.73	2.12
Traditional	0.86	0.18	4.20	0.48	0.06	3.89	2.48	0.62	9.92	2.54	0.74	8.75
No Religion	1.90	0.60	5.99	4.85**	1.29	18.29	1.20	0.28	5.18	2.64**	1.08	6.50

Current Age												
15-19	1.00			1.00			1.00			1.00		
20-24	3.44***	1.82	6.46	8.77	3.96	19.43	4.18***	2.48	7.06	5.00***	3.55	7.04
25-29	7.45***	2.58	21.48	13.99	5.20	37.67	10.63***	5.66	19.98	9.68***	6.46	14.50
30+	33.19***	5.86	187.99	59.54	16.41	216.10	19.79***	9.31	42.07	22.3***	14.18	35.24
Contraceptive Use												
Never used	1.00			1.00			1.00			1.00		
Ever used	1.20	0.67	3.48	0.95	0.52	1.73	0.76	0.52	1.12	1.13	0.90	1.43
Age at 1st sex												
Less than 17	1.00			1.00			1.00			1.00		
17-18	0.88	0.46	1.67	0.24	0.12***	0.49	0.71	0.44	1.16	0.50***	0.37	0.68
19+	0.31**	0.12	0.80	0.17	0.07***	0.40	0.35***	0.20	0.60	0.25***	0.18	0.36
Constant	0.08***			0.08***			0.22**			0.243***		
Model % correct prediction	90			93.2			78.7			76.2		
Chi-square (df)	153.034(17)			159.198(17)			313.686(17)			667.760(17)		
Nagelkerke R2	0.329			0.332			0.26			0.32		
-2 Log Likelihood	429.141			409.092			857.367			2214.223		
Observation	889			1092			1546			3041		

Legend: * p<.1; ** p<.05; *** p<.01

Source: Computed by researcher from GDHS 1988, 1998, 2008 and 2014

The general observations of the results in 1988 show educational attainment and time of first sexual intercourse as being significantly associated with the occurrence of birth to women of never married status. Nagelkerke R square of 0.329 indicates that about 32.9 percent of the variations in the ever given birth status can be explained by the variables entered into the model (Table 7.5).

In 1988, place of residence, educational attainment, current age group and age at first intercourse were found to be significantly associated with childbearing by the never married after controlling for other variables. In 2008, education, current age and pre-marital sexual activity also emerged as predictors just as they did in 2014. In 1988, the predicted odds ratio by the model for place of residence is 2.32 (1.28-4.24) at a 95 percent confidence interval. This suggests that in 1988, never married women living in rural areas were about 2.362 times as likely to have ever given birth as women living in urban areas.

The model further predicted an odds ratio of 0.22 with a confidence interval of (0.64-0.75) at 95 percent significant level for women with secondary education. Indications are that never married women with secondary or higher education had lower odds of giving birth than never married women with no formal education. These women had 78 percent less chance of giving birth before marriage when compared to those who had no formal education. Age at first sexual intercourse also emerged as another predictor.

Comparatively, educational level and age at first sexual intercourse emerged as the only consistent variables which significantly predict the likelihood of a never married woman to have ever given birth across all the survey years.

Considering 2014, the likelihood of a never married woman with secondary education to have ever given birth (OR = 0.24 p=0.000) was 76 percent lower when compared to women with no education. However, women with primary and Middle/JSS though with their lower odds, were

not statistically significant when compared to women with no education. Similar observations were made in 2008, 1998 and 1988. This is an indication that women with higher levels of education are less likely to ever give birth before their first marriage. This highlights the important role of education in reducing fertility rates in Ghana.

Never married childbearing is more likely to occur when women begin sexual activity at early ages than when they become sexually active at later ages. It emerged that age at pre-marital sexual activity is consistent, statistically significant and associated with ever given birth status. The lower the age at sexual debut, the more likely a never married woman would have given birth.

The study further reveals that as the age of women increased the likelihood of never married women giving birth increased in 1998, 2008 and 2014. In 2014, for instance, never married women aged 30+ years were 22.3 times as likely to have ever given birth compared to women aged 15-19 years. Similarly, in 2008, women aged 30+ years were found to be 19.8 times more likely to have ever given birth when compared to women who were less than 30 years.

The use of contraceptives to control fertility is not supported by the results of this study. It appears from the data that women who had ever used contraceptives were more likely to have ever given birth than women who had never used any contraceptives. This was contrary to the usual expectation. Ever use of contraceptives was however not a significant predictor of fertility. It is not clear why ever use of contraceptives was rather associated with ever given birth status, but it may be possible that contraceptives would have been used for spacing the interval between births rather than stopping pregnancy. Also, never married women perhaps may not have had adequate knowledge on best ways to use contraceptives.

The results of the study thus indicate that never married fertility has been influenced by educational level, age at first sexual intercourse and current age of women. Indications are that

pre-marital sexual norms are changing possibly due to weakening family control that comes with modernization. Increasingly, more women are having sex before their first marriage. It is possible that pregnancy before marriage as proof of a woman's fertility is gradually becoming the norm in Ghana. This contrasts with a study by Alo and Akinde (2010) in an urban society in Northern Nigeria. In their study, they observed that a great importance is attached to female virginity. This is influenced by an Igbo custom that compels a new bride to divulge before an idol the name of persons with whom she has had an intimate relationship since betrothal. This according to the study helped to forestall pre-marital sex.

However, it has been acknowledged that age at menarche is decreasing whilst age at first marriage is increasing. Thus, the weakening sexual norms will imply a longer period of sexual activity before marriage. With the lower use of contraceptives, more women are likely to be exposed to the risk of unintended pre-marital births which will eventually result in increased fertility in Ghana.

Pre-marital births have also been found to significantly affect the timing of first marriages (Calvès, 1999; Hattori & Larsen, 2007; Smith-Greenaway & Clark, 2018). Hattori and Larsen (2007) observed that women who had been single mothers for over five years were significantly less likely than women without children to enter into their first marriage. Pre-marital births, therefore, become a barrier that restricts access to potential partners at the marriage market. Hence, with the increasing pre-marital fertility in Ghana, age at first marriage is more likely to further increase as women with pre-marital births are more likely to be marginalized at the marriage market. This is corroborated by Calves (1999) who asserts that pre-marital first births are associated with decreased likelihood of marrying. This however, will depend on time lapse between first birth and the desire to enter the marriage market. Women with children of younger ages had higher chances of marrying than those who had a longer time after first birth.

7.5 Concluding remarks

In this chapter, an attempt is made to describe the trends in never married fertility and its socio-demographic determinants. The period of study displays an upward but inconsistent trend in never marital fertility. The increasing trend since 2003 may be an indication of the weakening relationship between marriage and childbearing. Traditionally, childbearing is often linked to marriage (Awusabo-Asare, 1988; Takyi & Addai, 2002; Tawiah, 1984) but indications are that never married fertility is becoming common in Ghana. This will most likely affect the family structure of the country.

It has been widely acknowledged that children born to never married women have poorer social health and economic outcomes than those born to married women. A study of the health effects of single motherhood on children in three SSA countries (Nigeria, Cameroun, and the Democratic Republic of Congo) indicated that compared with children whose mothers were in union, children of single mothers who were not widows were more likely to be stunted. The study further indicated that relative to children of mothers in union, the risk of under-five mortality in single mother families was higher in all the three countries studied (Ntoimo & Odimegwu, 2014).

Besides, the rising rate of never married fertility may also pose a threat to efforts being made to reduce fertility in Ghana. The data was not enough to explain the sharp drop in fertility between 1998 and 2003. However, it would be important to identify policies or factors that necessitated the sharp drop in never married fertility between 1998 and 2003. These need to be revisited in any effort to halt the increase in never married fertility.

The wide variations among the never married fertility with regards to religious affiliation is an indication of how religion can be used as a tool to regulate fertility. The lowest fertility reported for Muslims and Christians may be an indication of a disapproval of premarital births by these religions. Births to women in the never married status among these religious groups are often

classified as 'illegitimate' and sanctions are sometimes meted out to offenders with both mothers and children suffering from societal stigma as a result. It was, however, surprising to note the relatively higher fertility amongst never married Catholics.

Catholics are perceived to have a very strong stance against the use of non-natural means of fertility control. They believe that the principal purpose of sex in marriage is procreation, hence couples are discouraged from using modern methods of contraception. However, people of the protestant sects are more liberal in this regard (Addai, 1999; Bakibinga et al., 2016). With their strict adherence to doctrine, it was expected that Catholics would have had the lowest fertility among the never married but the findings of the study was to the contrary and may suggest the influence of secularization of beliefs among many Christians, resulting in a more liberal attitude and tolerance for sex before marriage.

The very high levels of fertility among women with no religion is to be assessed with caution because a relatively small percentage was sampled. Nonetheless, the findings indicate that the spread of monotheistic religion (Islam and Christianity) has had an influence on fertility among the never married. This, in effect, is a confirmation of observations made in an earlier study on age at marriage and modernization in Sub-Sahara Africa (Garenne, 2004). The important role of education and urbanisation became apparent in the fertility differentials with the lowest fertility recorded for highly educated women and women living in urban areas.

Apart from the increase in never marital fertility, it became obvious that the proportion of never married women that have ever given birth was observed to be on the increase since 1998. This is an indication that childbearing before marriage is becoming more prevalent in Ghana with about 17 percent of never married women having at least one live birth in 2014. The level of education and sexual activity were consistently associated with the likelihood of ever giving birth before marriage. This confirms findings from several studies from SSA which postulate that expanding access to education for females has the effect of reducing fertility behaviours at

all levels (Askew, Maggwa, & Obare, 2017; Garenne, 2008; Mensch, Singh, & Casterline, 2005).

In sum, this chapter examined the levels, trends and differentials in never married fertility. It is evident that the fertility of never married women is gradually increasing in Ghana. With the increasing age at which women marry for the first time, the proportion of never married women is expected to further increase. This will most likely be accompanied by higher risk of having children before first marriage. The contribution of the changing composition of never married women on the overall fertility decline will be discussed in the next chapter.

CHAPTER EIGHT

DECOMPOSITION OF THE CHANGES IN TOTAL FERTILITY RATE IN GHANA

8.1 Introduction

In the previous sections, recent trends in never married and ever married fertility were discussed. It appears that whilst ever marital fertility has seen some consistent decline, never marital fertility has been rising since 2003. Besides, the discussions on trends and patterns of marriage prevalence and incidence shows that the proportion of never married women has been increasing whilst those entering into marriages are doing so at later ages in recent times. This has resulted in a steady increase in the Singulate Mean Age at Marriage for the two and half decades under study.

The influence of the changes in the proportion marrying as well as changes in marriage timing on fertility has been rarely explained in the context of Ghana's fertility transition. It has been asserted that postponement of first marriage into later years could be a driving force behind fertility decline but this remains plausible in societies in which fertility occurs mostly within marriage. Other studies have also indicated that rising age at first marriage could also expose more women to the risk of childbearing outside marriage in the face of early initiation of sexual activity and low contraceptive prevalence (Clark et al., 2017; Garenne & Zwang, 2006; Meekers, 1994; Smith-Greenaway & Clark, 2018). In effect, the benefit of an increased age at marriage on fertility reduction could be attenuated by an increase in never married fertility but the extent to which this is true has been rarely investigated in Ghana. Relatively, not much is known about changes in total fertility having been caused by changes in either age composition of the ever married (marital structure), changes in marital fertility and changes in never marital fertility

8.2 Components of the change in total fertility rate due to changes in marital structure and marital fertility, Ghana, 1988-2014

In this section the recent changes in Ghana's total fertility rate are decomposed into three sub-components, namely: marital structure (as described by the proportions ever married at different ages, and proportions never married at different ages), ever-marital fertility (the fertility of ever married women) and never marital fertility (the fertility of never married women). This has been done to determine and compare their relative contributions to the decline in Ghana's fertility. This section, therefore, seeks to use a decomposition technique to determine the components of changes in total fertility rate (TFR) due to marital structure and marital fertility, covering the inter survey periods, 1988-2014. Details of the computation procedure are outlined in Appendix C. Table 8.1 presents the results of the change in total fertility for the period under study.

Table 8.1 Decomposition of the changes in total fertility rate in Ghana from 1988-2014

Age Group	Marital composition		Fertility rates		Total change in TFR
	Ever married	Never married	Ever married	Never married	
15-19	-0.27	0.03	0.00	0.05	-0.20
20-24	-0.52	0.10	-0.06	-0.04	-0.52
25-29	-0.31	0.05	-0.15	0.00	-0.41
30-34	-0.10	0.01	-0.18	0.01	-0.26
35-39	-0.03	0.00	-0.25	0.01	-0.27
40-44	-0.01	0.00	-0.32	0.00	-0.33
45-49	0.00	0.00	-0.22	0.00	-0.22
TFR Change	-1.24 ↓	0.19 ↑	-1.18 ↓	0.02 ↑	-2.21 ↓
Percent contribution to TFR change	56.2	-8.6	53.3	-0.9	100.00

Source: Computed from GDHS 1988 and 2014

As indicated by Table 8.1, the total fertility of Ghana declined by 2.21 (from 6.4 in 1988 to 4.2) in 2014. Changes in the marital structure, as shown by the changes in the age specific proportions of ever married women, contributed to a decline of about 1.24 of the T This was

the largest contributor as it accounted for about 56 percent of the decline. The decline, however, was attenuated by 0.19 increase in TFR by the increasing age specific proportions of the never married women, which resulted in an 8.6 percent increase of the overall change in TFR. Meanwhile, -1.18 of the decline within the period could be attributed to changes in marital fertility, and this accounted for 53.3 percent of the overall decline. Whilst an increase of about one percent of the change was caused by an increase in never married fertility, changes in age-specific proportion of the ever married women was the most important component of fertility decline. This finding illustrates how, in Ghana, an increase in the age at marriage could become a potential driver of fertility change relative to the changes in other components.

Table 8.1 further illustrates the components of change in age specific fertility rates. The age specific analysis provides additional explanations of how changes in the age specific proportions of the ever married and never married influenced fertility transition in Ghana. This analysis further indicates that the greatest changes occurred in the changing proportions of the ever married within 20-24 and 25-29 age groups, which contributed 0.52 and 0.41 of decline respectively in the overall TFR. The two age groups are known to be prime reproductive periods for married women. Greater proportions of the decline were concentrated by the shifts in the age at marriage within this age group. Suggestively, about 42 percent of the decline could be attributed to this age group. They were observed to have contributed 0.93 (0.52+0.41) of the overall 2.21 decline in TFR. In relation to the other age groups, the changes in the age composition of women aged 20-24 was greatest in absolute magnitude of the decline in the overall age specific fertility rates. This decline was, however, counter balanced by a slight increase in the age specific proportions of never married women. The implication is that the proportion never married rather caused a surge in the depressing TFR. This is consistent with a similar study in Ethiopia, where changes in marital fertility at the older ages were observed to have been the dominant component of fertility decline (Lindstrom & Woubalem, 2003).

It is also evident that changes in marital fertility played a minimal role in the decline at the lower ages (ages 15-24) as compared to the higher ages of above 30 years. The most dominant contribution (-0.32) was made by the changes in marital fertility for women aged 40-44 years. The implication is that the younger women delay marriage to have fewer children but the older women are controlling their fertility within their marriage. Meanwhile the increasing proportion of the never married are counter balancing the declines in TFR by the ever married.

8.3 Components of the changes in the total fertility rate due to marital structure and fertility from 1988-1998, 1998-2008 and 2008-2014

To track the changes in the components of change in TFR between inter survey periods, another decomposition analysis was conducted in order to explain the paths in the components of change in the TFR over the inter survey period under study. The changes in TFR were tracked to distinguish the period of rapid decline from period of the fertility stalls. The results are presented in Table 8.2, 8.3 and 8.4.

Table 8. 2 Age specific decomposition of the components of change, 1988 - 1998

Age Group	Marital composition		Fertility rates		Total change in TFR
	Ever married	Never married	Ever married	Never married	
15-19	-0.12	0.01	-0.03	-0.06	-0.20 ↓
20-24	-0.09	0.02	-0.18	-0.05	-0.30 ↓
25-29	-0.09	0.01	-0.29	-0.01	-0.38 ↓
30-34	-0.01	0.00	-0.35	0.00	-0.36 ↓
35-39	0.00	0.00	-0.26	0.00	-0.26 ↓
40-44	0.00	0.00	-0.23	0.01	-0.22 ↓
45-49	0.00	0.00	-0.25	0.00	-0.25 ↓
	-0.32	0.03	-1.59	-0.11	-1.98 ↓
	15.9	-1.6	80.1	5.6	100.00

Source: Computed from GDHS 1988 and 1998

Firstly, the age specific decomposition of the period of rapid fall and that of the stalling period are compared between period of rapid fall and that of decline. Tables 8.3 and 8.4 illustrate the results. It is evident from Table 8.2 that marital fertility of all the age groups contributed to the decline during the period of rapid falling of the TFR. The highest decline occurred within the ages of 30-34. Changes in never marital fertility and changes in the age composition of the never married at all ages made very small contributions to the overall fall in TFR. However, for the period of fertility stall, changes in the composition of ever married women aged 20-24 made the highest contribution to the overall decline in the TFR (-0.262 of Table 8.3). Changes in the never marital fertility and changes in age composition of the never married at almost all ages caused an increase in the overall TFR. This, in effect, slowed down the pace of the falling TFR. From all indications, delayed transition to first marriage has been the main driver of the fertility decline in Ghana between 1988 and 2014.

Table 8. 3 Age specific decomposition of the components of change, 1998 - 2008

Age Group	Marital composition		Fertility rates		Total change in TFR
	Ever married	Never married	Ever married	Never married	
15-19	-0.099	0.007	-0.006	0.059	-0.039 ↓
20-24	-0.262	0.036	0.061	0.022	-0.143 ↓
25-29	-0.108	0.010	0.070	0.017	-0.010 ↓
30-34	-0.031	0.002	0.018	0.005	-0.006 ↓
35-39	-0.015	0.002	-0.087	0.003	-0.097 ↓
40-44	-0.005	0.020	-0.060	-0.025	-0.070 ↓
45-49	0.000	0.000	-0.015	0.000	-0.015 ↓
	-0.519	0.077 ↑	-0.019	0.081 ↑	-0.380 ↓
	136.571	-20.201	5.054	-21.425	100

Source: Computed from GDHS 1998 and 2008

Table 8.4 provides an overview of the components of change with the overall changes in TFR based on the pace of decline. The period from 2008 to 2014 demonstrates some reversals in the decline whilst 1988 to 1998 was noted for a rapid decline.

Table 8.4 Decomposition of the changes in total fertility rate in Ghana from 1988-1998, 1998-2008, 2008 to 2014

Pace of TFR decline over the survey years	Magnitude of change	Marital composition		Fertility rates		Total change in TFR
		Ever married	Never married	Ever married	Never married	
Rapid falling Period (1988-1998)	Actual	-0.32	0.03	-1.59	-0.11	-2 ↓
	%	16.1	-1.5	79.9	5.5	100%
Slow to stalling period (1998-2008)	Actual	-0.52	0.079	-0.02	0.081	-0.4 ↓
	%	136.6	-20.2	5.1	-21.4	100%
Reversals in decline (2008-2014)	Actual	-0.3	0.0	0.4	0.1	0.2 ↑
	%	-159.9	22.93	200.3	36.6	100%

Source: Computed from GDHS 1988, 1998, 2008 and 2014

It emerged that during the period of the rapid decline (1988 to 1998) in Ghana’s fertility transition, marital fertility was the greatest component of decline, accounting for 80 percent of the overall decline in TFR. Again, the available data was not enough to explain how and why marital fertility declined that much. However, this decline coincided with the period where greater attention of the country was focused on sexual and reproductive health. Support from international agencies such as the Danish International Development Agency (DANIDA), The UK’s Department for International Development (DFID), the United States Agency for International Development (USAID) to selected non-governmental organisations was helpful in promoting behavioural communication strategies like the campaign dubbed “*It’s your life; It’s your choice*” and these strategies might have influenced the changes in behaviour that perhaps contributed to the decline.

Comparing the components of change over two ten-year periods 1988-1998 and 1998-2008 provided further insights into how the components of change varied within the period under study. The important role played by delayed age at marriage in fertility transition becomes even more evident here. This component contributed only 16.2 percent of the change in TFR for the 1988-1998 period. However, from 1998 to 2008, its role had become extremely significant as it contributed as high as 136.6 percent of the decrease. Meanwhile, changes in never married fertility on the contrary caused a major increase of 21 percent in total fertility whilst the changes in the proportions never married led to 20 percent increase in TFR between 1998 and 2008. This compares favorably with the 1988-1998 change where the role of the never married in fertility change was quite insignificant.

Considering this finding on the never married, it is clear that their role in influencing Ghana's fertility is gradually becoming more important. This is an indication that the never married have a strong potential to cause an increase in Ghana's fertility rate. The gains made by reduction in marital fertility is at the risk of the consistent increase in the proportion the never married. Therefore, changes in the never married population could be associated with the stalling fertility in Ghana.

Contrary to the two ten-year periods hitherto discussed, total fertility increased slightly between 2008 and 2014 by 0.2, and 0.388 (200 percent) of this decline was contributed by the evermarried fertility rate (Table 8.4). This was, however, offset by 0.3 decline in the TFR due to the significant change in the age specific proportion of the ever married. The decline of 159.9 percent caused by this change was significant enough to counter the 200 percent increase in marital fertility rate. Here, the significant role played by increasing age at first marriage towards fertility decline is further illustrated. The implication is that but for the postponement of marriage, Ghana's fertility would have seen a higher rate of increase between 2008 and 2014.

The period of stalls in fertility rate from 1998 to 2014 was, on the other hand, associated with changes in the composition of the ever married as the major contributor of fertility change, which was attenuated by an increase in TFR of marital fertility. It is clear from the study that the increase in the proportion of the never married women in Ghana has been accompanied by an increase rather than a decrease in never marital fertility. This is contrary to a study in Ethiopia, where the delay in first marriage, and the increase in the proportion of the never married rather resulted in a decline in non-marital fertility (Lindstrom & Woubalem, 2003). The difference is that whereas in Ethiopia, childbearing before marriage is not tolerated, childbearing before marriage prevails in Ghana. This raises questions about the Malthusian effect of delayed marriages as a way of reducing fertility rate. This finding is supported by a proposal that, delaying marriage would have the potential to reduce fertility in Ghana, if it is accompanied by a low level of never married fertility (Weeks et al., 2010).

8.4 Changes in TFR and the components of change for the period 1988-2014, 1988-1998 and 1998-2014 by level of education

The extent to which changes in the age composition of ever married and never married, and marital fertility contributed to the overall fertility decline was discussed in the previous section. The decomposition analysis is further extended in this section to examine if the contribution of educational level to fertility change is more of a compositional effect or a behavioral effect of control of fertility within marriage. The 26-year change in fertility for each educational level is decomposed into the four main components. Further decomposition was done to differentiate the period of rapid decline from that of the stalled decline. For convenience, the result of the actual change and the percentage change in the decomposition by the level of education is only presented. Table 8.5, 8.6 and 8.7 summarize the results.

Table 8.5 Decomposition of the changes in total fertility rate by level of education, 1988-2014

Educational level	Magnitude of change	Marital composition		Fertility rates		Total change in TFR
		Ever married	Never married	Ever married	Never married	
No Education (1988-2014)	Actual	-0.44	0.09	-0.64	0.02	-0.97
	%	45.0	-9.0	66.2	-2.2	100.00
Primary Education (1988-2014)	Actual	-0.76	0.19	-1.09	0.04	-1.62
	%	46.8	-11.9	67.4	-2.2	100.00
Middle/JHS (1988-2014)	Actual	-0.84	0.17	-1.25	0.14	-1.78
	%	47.1	-9.5	70.0	-7.6	100.00
Secondary (1988-2014)	Actual	-0.93	0.08	-0.17	0.10	-0.93
	%	100.6	-8.6	18.7	-10.7	100.00

Source: Computed from GDHS 1988, 1998, 2008 and 2014

Table 8.6 Decomposition of the changes in total fertility rate by level of education, 1988-1998 (rapid falling period)

Pace of TFR decline per Education	Magnitude of change	Marital composition		Fertility rates		Total change in TFR
		Ever married	Never married	Ever married	Never married	
No Education (1988-1998)	Actual	-0.29	0.05	-1.14	-0.04	-1.42
	%	20.7	-3.3	79.8	2.8	100.00
Primary Education (1988-1998)	Actual	-0.34	0.08	-1.23	-0.16	-1.65
	%	20.5	-4.9	74.6	9.9	100.00
Middle/JHS (1988-1998)	Actual	-0.18	0.02	-1.91	-0.14	-2.22
	%	8.2	-0.7	86.0	6.5	100.00
Secondary (1988-1998)	Actual	-0.37	0.03	-0.38	-0.09	-0.81
	%	45.4	-3.2	47.2	10.6	100.00

Source: Computed from GDHS 1988, 1998, 2008 and 2014

For the overall change in TFR from 1988-2014, the TFR declined by 0.97 among women with no education and 1.62 for women with primary education (Table 8.5). In the changes in TFR, the contribution of marital fertility is higher relative to the other component changes for almost all the educational levels. The only exception was for women with the highest level of education where the changes in the composition of the ever married made the greatest contribution. For the women with primary education, 67 percent of the decline in the TFR was contributed by marital fertility with a 47 percent contribution by the changes in the composition of the ever married. This was however attenuated by a twelve percent and two percent increase in the composition of never married and never married fertility respectively. However, delayed marriage contributed 100 percent of the 0.93 decline in the fertility of women with secondary education.

For the period of rapid fall in fertility (1988-1998), the decline could be attributed mostly to marital fertility than to the composition of married and never married women. Almost 80 percent of the change of the fertility of women with lower levels of education was contributed by marital fertility. However, during the period of stagnation in fertility decline, it seems delayed marriage was the most significant contributor.

Table 8.7 Decomposition of the changes in total fertility rate in Ghana by level of education, 1998-2014 (stalling period)

Pace of TFR decline over the survey years	Magnitude of change	Marital composition		Fertility rates		Total change in TFR
		Ever married	Never married	Ever married	Never married	
No Education (1998-2014)	Actual	-0.15	0.02	0.45	0.10	0.43
	%	-34.3	5.7	104.5	24.2	100.00
Primary Education (1998-2014)	Actual	-0.48	0.11	0.10	0.25	-0.02
	%	1967.0	-449.1	-416.2	-1001.7	100.00
Middle/JHS (1998-2014)	Actual	0.59	0.31	-0.61	0.12	0.42
	%	141.1	74.8	-143.8	27.9	100.00
Secondary (1998-2014)	Actual	-0.59	0.04	0.23	0.17	-0.14
	%	410.4	-29.8	-159.0	-121.6	100.00

Source: Computed from GDHS 1988, 1998, 2008 and 2014

8.5 Concluding remarks

In this chapter, an attempt is made to decompose the changes in TFR into components of change due to marital structure, marital fertility and never marital fertility.

It emerged from the study that the decline in TFR of 2.21 between 1988 and 2014 was accounted for largely by changes in the age composition of ever married women. This contributed 56.2 percent of the overall decline in TFR. Indications are that delayed marriages made the greatest contribution to the fertility transition in Ghana. This was, however, attenuated by an 8.6 percent increase in the TFR contributed by the changing composition of the never married. Thus whilst the decline in the prevalence of marriage facilitated a decline, an increase age composition of the never married became a counterbalance to the decline. This contrasts with similar studies in Nepal where marital fertility was the greatest contributor to the fertility decline, with over three-quarters of the decline in the TFR being attributed to this component (Retherford & Thapa, 2004; Shakya & Gubhaju, 2016).

Previous studies in some other countries have all attributed the most significant changes in the overall TFR to marital fertility than to marital structure (Abbasi-Shavazi, 2000; Gubhaju et al., 2014; Lindstrom & Woubalem, 2003). It is significant to note that these studies have been conducted in countries like Iran, Fiji and Ethiopia where marriage is synonymous to childbearing. The changing composition of the ever married and never married in Ghana has therefore provided further insight into how delayed marriage could explain fertility transition in Africa.

The continuing departure from traditional and religious norms regarding transition to family formation has been the core of the second demographic transition theory which has been supported by findings in this chapter. It has been suggested that marriages with parenthood are being delayed due to ideational changes that encourage newly married couples to use their marital unions to satisfy individualistic needs rather than the traditional demand of procreation (Mills, Rindfuss, McDonald & Te Velde, 2011). In line with this suggestion, it can be argued that women can now afford to delay their marriage and/or postpone parenthood and have smaller number children within a shorter reproductive lifespan. The extent to which this assertion may be true for Ghana could not be assessed in this study due to the unavailability of data. Further studies using qualitative methods will be necessary to explain how couples use delayed marriages to limit fertility in Ghana.

The age specific analysis of the components of change has been helpful in providing explanations to the extent to which the fertility transition in Ghana could be explained by delayed marriage. Postponing marriage at younger ages of women is more important to the reduction of total fertility rates than promoting fertility control within marital unions. However, marital fertility yields larger contributions to fertility declines at older ages. This should inform policy makers in the distribution of the scarce resources to the different age groups for effective delivery of family planning services.

In conclusion, this study has shed further light on the components of fertility transition in Ghana and the extent to which variations in this transition have been influenced by changes in the age composition of the ever married and marital fertility. The results of the decomposition analysis demonstrate the significant role of delayed marriage in Ghana's fertility transition in recent times. Ghanaian women seem to have controlled their fertility within marriage during the period of rapid fall in fertility but they are now delaying marriage as a way of reducing fertility. The policy and research implications of the findings of this study will be discussed in the following chapter.

CHAPTER NINE

SUMMARY, RECOMMENDATIONS AND CONCLUSIONS

9.1 Introduction

This study set out to examine the influence of the changes in the prevalence and timing of marriage on Ghana's fertility transition for the period of 1988 to 2014. The study was mainly quantitative in design and relied on the six rounds of data collected from the demographic and health surveys in Ghana. This chapter summarises the research findings based on the stated objectives. The chapter also provides general conclusions and recommendations regarding the future of fertility transition in Ghana.

9.2 Summary of findings

This study confirms previous studies in the sub-region which assert that significant changes have occurred concerning the timing and prevalence of marriages. Delays in the timing of marriages, declines in the prevalence of marriage and increase in the proportion of never married women were noticed. It was also observed that the increase in the age composition of never married occurred mostly in the prime reproductive age groups of 25–39 years. The singulate mean age at first marriage (SMAM) has consequently, increased consistently from 1988, an indication that more years are being spent in the never married status before marriage. The highest SMAM recorded for each survey year was observed for women with secondary education or higher. Similarly, the increase in SMAM over the study period was rapid for women with highest level of education relative to the other educational levels. Profound changes were observed in marriage timing in both rural and urban areas in Ghana during the study period. In rural areas, SMAM was always lower than in urban areas. The increase in SMAM was more rapid for urban areas than it was for rural areas. This confirms the hypothesis that urban women marry at later ages than rural women do.

It was also observed that the proportion of women in marriage have also declined consistently over the years with the greatest decline occurring among adolescents. This is also consistent with studies that have been conducted in Sub-Saharan African countries.

These findings provide enough evidence to conclude that the nuptiality transition that has been observed in some parts of the world is now occurring in Ghana, with a trend toward delayed marriages (Ortega, 2014). These changes are being driven by increased access to formal education, urbanisation as well as the weakening of norms that place the act of sexual intercourse and childbearing in the context of marriage. Some of the characteristic features of the Second Demographic Transition Theory such as decline in marriage are evident in Ghana.

Declines in the TFR since 1988 are also observed in this study. The highest decline occurred between 1988 and 1998. The decline has been stalling at four births since 1998. Consistent with other studies, declines in fertility were influenced by changes in the socio-demographic conditions in the country. Modernisation variables of higher educational levels and growth in urbanisation were the key factors. Besides, fertility varied by marital status. Marriage in Ghana is closely linked to childbearing as most of the births have occurred to ever married women than to never married women.

Moreover, it was evident that marital fertility has shown a consistent decline and this almost paralleled the decline in total fertility rate. The decline was also consistent with the age-specific marital rates. Catholics recorded the lowest ever marital fertility rates relative to the other religious denominations. Apart from this, decline in marital fertility was also rapid for Catholic women than those in the other religious groups. Though the data show that women who delayed their first marriage had a lower TFR relative to women who married early, the multivariate analysis indicated that age at first marriage was not consistent and statistically significant in its relationship to total fertility. Significantly, increased educational attainment by women and

increased urbanisation emerged as the most influential and consistent predictors of decline in ever marital fertility rate in Ghana.

However, the changes in never marital fertility, were observed as being unstable over the years. Indications are that never marital fertility rate has been increasing since 2003. The likelihood of a never married woman to ever give birth prior to marriage was lower for women with secondary and higher levels of education compared to those with no education, and this was consistent across all the survey years.

Evidence from this study confirms the ongoing fertility transition in Ghana with a significant decline occurring between 1988 and 1998. This transition conforms to the classical Demographic Transition Theory within which fertility responds to improvements in the socio-economic conditions in a country. Growth in urbanisation as well increased access to education by females has occurred in the country. This, in effect, depressed declines both marital and the never marital fertility rates. However, weakening traditional norms with regards to childbearing within marriages may have caused never marital fertility rates to be on the increase since 2003.

Evidently, during the period of rapid fall in fertility changes in marital fertility made profound contributions to fertility change (about 80%) whilst the other components of change composed of the never married, never marital fertility and marital fertility played minimal roles. Marital fertility is one area that policymakers can target for interventions that seek to accelerate fertility decline.

Tracking the changes from the period of rapid decline to the period of stalls showed that the relative contributions of the components of change are shifting from changes in marital fertility to changes in the age composition of the ever married women. The implication is that the changes in the proportion of ever married women made more contributions to the overall fertility transition relative to marital and never marital fertility rates. Hence, delayed marriages

are becoming more important in fertility decline than the practice of controlling fertility within marriage.

However, from 1998-2008 when fertility decline was mostly stalled, it emerged that the significant contributions to the decline, made by marital structure, was counterbalanced by 'never marital fertility as well as the changing composition of the never married women. Indeed, the stalls were influenced by an increasing never marital fertility rate and increasing proportions of never married women. The effect was that these components rather pushed the fertility rate upward by 20.4 percent and 20.2 percent respectively. Thus, whereas the change in the composition of the ever married and marital fertility had a depressing effect on fertility, the changes in the composition of never married women and never marital fertility had the effect of pushing up the total fertility during the period of stall. This counteracting effect may explain the stalls in fertility between 1998 and 2008.

The five-year period between 2008 and 2014 rather saw a slight reversal of the observed fertility decline. This was mostly associated with substantial increase in marital fertility, which pulled fertility upwards. However, the counter effects of a decline in the contributions made by the composition of ever married women was enough to nearly neutralise this observed change. This brings to the fore the important role being played by marital fertility to fertility transition in Ghana. But for the changes in marital structure, fertility would have seen a higher increase than what was observed in 2014.

9.3 Recommendations

The Revised Population Policy of Ghana aims at specifically reducing TFR to 3.0 by the year 2020. However, the decline in TFR is observed to have stalled around 4 births for the past two decades. Considering the trends in delayed marriage, indications are that the proportion of never married women are more likely to continue in its steady increase in the near future whilst

the fertility behavior the never married will contribute a substantial increase to the overall total rate. This raises the possibility of a continued stall or a further increase in the TFR if serious strategic efforts are not made by the National Population Council and other policymakers to curb the rising never married fertility rate.

The increasing never married fertility could mitigate any effort to reduce the current TFR to the targeted 3.0 by the year 2010. Therefore, it is recommended that the Government of Ghana (GOG) through the National Population Council and its policy affiliates intensify policies that seek to promote abstinence until marriage. Since the current abstinence campaigns often target teenagers, this study hints that it is important for messages to be now tailored to women of all ages. It is anticipated that encouraging never married women to delay or avoid sexual activity will reduce the risk of an unexpected pregnancy. The steady growth in the fertility of never married women will most likely result in a large number of single mothers, considering the rate at which women are delaying transition into marriage. Single motherhood has been associated with many adverse effects such as poor nutritional status, higher infant mortality and poor academic levels on children's wellbeing.

Considering the rate of decline in the prevalence of marriage and an increase in the proportion of never married women at higher ages. It is possible that some of the currently never married women would continue to remain in the never married single motherhood state for a longer time. This, therefore, makes their fertility worthy of research by demographers in order to direct policy that would address their specific needs or formulate programs by governmental agencies that aims to control the fertility in Ghana.

In addition, policies that seek to reduce fertility should focus more on expanding access to formal education for all women. Since higher education was consistently associated with both lower never marital fertility and marital fertility. Higher education most likely will keep girls in school for longer period and will, therefore, compete with the desire to either marry or start

childbearing early. Whilst expanding secondary education, efforts should be made to target women with lower educational levels or those with no formal education for more information on how to control fertility within marriage. This, in a way, will reduce the higher rates of fertility among the ever married women and never married women. To this end, the current media campaign by the coalition of NGOs in education, sensitizing parents to send their children especially females to school should continue.

It was observed that some of the women had given birth before their first marriage. However, the GDHS data was not enough to establish if the current husband is the biological father of the first child. It is therefore recommended that the Ghana Statistical Service collaborate with the DHS program in the subsequent rounds of GDHS to expand the module on marriage to incorporate the relationship history of the respondents. This will enable a detailed analysis of how changes in marriage patterns affect fertility. On the hand, The Government of Ghana through the National Population Council should commit more resources into the compilation of comprehensive vital registration and longitudinal data collection as this has the benefit of enhancing the ability of providing efficient estimates of future trends in population growth.

It was further revealed in the study that never married women who had ever given birth also increased from 1988 to 2014. The implication is that even though Ghanaian women are entering into marriage at a later age, they are more likely to have children before their first marriage. This could imply that the social context within which childbearing is occurring may be changing. This calls for further studies on reasons why women are resorting to childbearing before marriage. Previous studies have indicated that unmarried teenagers use sex and pregnancy to achieve certain goals, the extent to which this is true for Ghana can be verified through qualitative research.

Rural and urban places of residence have been highlighted in this study and many others to have great influence on marriage formation and fertility. Measures should thus be taken by the

government of Ghana through the Ministry of Local Government and civil society organisations to strengthen the institutional capacity in rural areas. The extension of better social amenities to rural communities is expected to enhance the status of women in rural areas. More women living in rural areas will gain access to formal education, will be exposed to family planning message broadcasts and will also gain formal employment. It is hoped that once young adults find alternate roles of self-development, they would not be satisfied with the traditional system of being a wife and a mother at younger ages. In this case, more women in rural areas would opt for late marriages, and hopefully fertility control.

findings underscore the need to target never married women of all ages for sexual and reproductive health services. From the decomposition analysis, it was evident that never marital fertility most often offsets the declining marital fertility to mitigate fertility decline in Ghana.

Results from the decomposition analysis also showed that there has been a shift from the relative contribution of marital fertility to changes in the age composition of ever married women. This suggests that marriage patterns are becoming more important than the control of fertility within marriage. This calls for intensive family planning programmes and policy interventions that will encourage women to control their fertility within marriage. In the light of this, messages should be designed to target women who do not want to have children now.

It is significant to note that among never married women, changes in marital structure tend to increase TFR. This finding calls for supporting policies and interventions such as expansion of access to female education, campaigns to reduce pre-marital sex, etc. that will lead to significant reductions in never marital fertility rates. The study further highlights the potential role of the never married women in stalling the fertility decline in Ghana. Whereas the changes in marital fertility contributed to the decline in the TFR, this decline was counter-balanced by the influence of never marital fertility. Given that the proportion of never married women is steadily rising and never marital fertility has been on the increase since 2003. It has become

more necessary now than ever to specifically address the sexual and reproductive health needs of the never married. Reports from the Ghana Demographic and Health Surveys indicate that higher proportions of births to the never married are most often mistimed or unexpected. Meanwhile, contraceptive prevalence is low among the never married. Arguably, more effort is needed to control never married fertility in Ghana.

Even though much effort has been put into the provision of family planning services for all women in the country, little attention has been paid to prevention measures for never married women, aged 20 years and above. Thus, there is a need for a comprehensive approach that will involve both government agencies and civil society organisations to reduce the rate of increase in childbearing to never married women of all ages.

The growing proportions of never married women emanating from delayed marriages is yet to attract the attention of research by Ghanaian demographers hence not much is known about the characteristics of these women. This includes their general perceptions about marriage, their intention to marry or not and how they have negotiated or accepted their singlehood in a country where marriage is expected to be the norm for adult females. Meanwhile, it is possible that remaining an unmarried adult would be a rewarding experience or a challenging situation for females in conservative communities where marriage is the norm. Given the trends in the declines in marriage prevalence, it is important to provide further insights into the perception of never married women about marriage and childbearing; whether they intend to marry; and their perceived barriers to marriage. The study therefore recommends some qualitative studies to explore the lived experiences of never married adults in Ghana with regards to their childbearing experiences.

9.4 Conclusion

All in all, the study has examined the fertility transition in Ghana over a period of three decades. The study has shown that changes in the proportion of ever married women at various ages made greater contributions to the declining fertility in Ghana than changes in marital fertility. That notwithstanding, the increasing proportion of never married women is slowing down the pace of fertility decline in Ghana. The study has also identified the significant socio-demographic determinants of age at first marriage, marital fertility and never marital fertility. This study fills some of the gaps in the knowledge of what is actually instigating the stalls in fertility decline in Sub-Saharan Africa. Declines in the proportions of ever married women at the prime reproductive ages serve to reduce fertility whilst the increasing proportion of never married women tend to increase fertility. Overall, formal education and urbanization were the consistent variables that interacted with marriage timing and prevalence of marriage to drive the fertility transition in Ghana.

The substantial increase in the proportion of females with secondary education and its resultant effect on the decline in marital fertility is an indication that the Free Compulsory Universal Basic Education that was initiated in the 1990s is yielding positive results in fertility transition. The expansion of this policy to now include secondary education through the launch of the Free Senior High School in 2017 will see more girls being motivated to pursue education to higher levels and since this will mean their staying in school for a longer period, the overall TFR will be, consequently, further reduced.

The study concludes from the decomposition analysis that postponing marriage at younger ages for women is more important to the reduction of total fertility rates than promoting fertility control within marital unions. To this end, the policy to reduce the proportion of women who marry before the age of 18 years is laudable and as such, the National Population Council should commit more resources to sensitize Ghanaians to avoid early marriages. However,

evidence from the multivariate analysis indicate that delaying marriage alone will not have significant influence on fertility unless this is linked to other agents of modernization. The fact that increased access to secondary education emerged as a major driver of delayed marriage in Ghana, is an indication of the role of formal education as an essential prerequisite to understand demographic transition.

In all these, the study indicates the consistency in never marital fertility and changing composition of never married women in stalling the decline in Ghana's fertility rate. The fact remains that the increase in proportion of never married women is not likely to be reversed in the coming years. This group therefore has the potential to reverse the fertility decline in Ghana if measures are not taken to control or reduce their fertility.

REFERENCES

- Abbasi-Shavazi, M. J. (2000). *Effects of marital fertility and nuptiality on fertility transition in the Islamic Republic of Iran, 1976-1996*. The Australian National University.
- Addai, I. (1999). Does religion matter in contraceptive use among Ghanaian women? *Review of Religious Research*, 40(3), 259–277. <https://doi.org/10.2307/3512371>
- Agyei-Mensah, Samuel. (2007). New times, new families: The stall in Ghanaian fertility. In *5th African Population Conference*. Arusah. Retrieved from <http://uaps2007.princeton.edu/abstracts/70391>
- Agyei-Mensah, Samuel. (2006). Fertility transition in Ghana: Looking back and looking forward. *Population, Space and Place*, 12(6), 461–477. <https://doi.org/10.1002/psp.425>
- Ameyaw, E. E., Badasu, M. D., & Codjoe, S. N. A. (2013). The contribution of the proximate determinants to fertility transition in Ghana. In *XXVII IUSSP International Population Conference*. iussp.org.
- Amoo, E. O. (2017). Trends and determinants of female age at first marriage in Sub-Saharan Africa (1990-2014): What has changed? *African Population Studies*, 31(1). <https://doi.org/10.11564/31-1-1024>
- Aryee, F. (1985). Nuptiality patterns in Ghana. In S. Singh, J. Y. Owusu, & I. H. Shah (Eds.), *Demographic Patterns in Ghana: evidence from the Ghana Fertility Survey 1979-80*. Voorburg Netherlands International Statistical Institute 1985.
- Asamoah, B. O., Agardh, A., & Östergren, P.-O. (2013). Inequality in fertility rate and modern contraceptive use among Ghanaian women from 1988–2008. *International Journal for Equity in Health*, 12(1), 37. <https://doi.org/10.1186/1475-9276-12-37>
- Askew, I., Maggwa, N., & Obare, F. (2017). Fertility transitions in Ghana and Kenya: Trends, determinants, and implications for policy and programs. *Population and Development Review*, 43, 289–307. <https://doi.org/10.1111/padr.12010>
- Awusabo-Asare, K. (1988). Interpretations of demographic concepts: the case of Ghana. *Population and Development Review*, 675–687.
- Bakibinga, P., Mutombo, N., & Mukiira, C. (2015). The influence of religion and ethnicity on family planning approval : A case for women in rural Western. <https://doi.org/10.1007/s10943-015-0030-9>
- Bakibinga, P., Mutombo, N., Mukiira, C., Kamande, E., Ezeh, A., & Muga, R. (2016). The influence of religion and ethnicity on family planning approval: A case for women in rural Western Kenya. *Journal of Religion and Health*, 55(1), 192–205.
- Bankole A. Audam A. (2011). Fertility preference and contraceptive use among couples in Sub-Sahara Africa. *African Population Studies*, 25(2), 173–188. <https://doi.org/10.11564/25-2-246>
- Blanc, A. K., & Grey, S. (2000). *Greater than expected fertility decline in Ghana: An examination of the evidence*. Calverton Maryland Macro International MEASURE DHS+ 2000 Aug.

- Boadu, K. (2002). The effect of contraceptive practice on fertility in Ghana : A Decade of Experience. *Canadian Population Studies*, 29(2), 265–291.
- Bongaarts, J. (2006). The causes of stalling fertility transitions. *Studies in Family Planning*, 37(1), 1–16. <https://doi.org/10.1111/j.1728-4465.2006.00079.x>
- Bongaarts, J. (2007). Late marriage and the HIV epidemic in Sub-Saharan Africa. *Population Studies*, 61(1), 73–83. <https://doi.org/10.1080/00324720601048343>
- Bongaarts, J. (2008). Fertility transitions in developing Countries: Progress or stagnation? *Studies in Family Planning*, 39(2), 105–110. <https://doi.org/10.1111/j.1728-4465.2008.00157.x>
- Bongaarts, J. (2010). The causes of educational differences in fertility in Sub-Saharan Africa. *Vienna Yearbook of Population Research*, (1), 31–50. <https://doi.org/10.1553/populationyearbook2010s31>
- Bongaarts, J. (2015). Modeling the fertility impact of the proximate determinants: Time for a tune-up. *Demographic Research*, 33(1), 535–560. <https://doi.org/10.4054/DemRes.2015.33.19>
- Bongaarts, J. (2017). Africa’s unique fertility transition. *Population and Development Review*, 43, 39–58. <https://doi.org/10.1111/j.1728-4457.2016.00164.x>
- Bongaarts, J., & Casterline, J. (2013). Fertility transition: Is Sub-Saharan Africa different? *Population and Development Review*, 38(Suppl 1), 153–168. <https://doi.org/10.1111/j.1728-4457.2013.00557.x>
- Bongaarts, J., Frank, O., & Lesthaeghe, R. (1984). The proximate determinants of fertility in Sub-Saharan Africa. *Population and Development Review*, 511–537.
- Bongaarts, J., Mensch, B. S., & Blanc, A. K. (2017). Trends in the age at reproductive transitions in the developing world: The role of education. *Population Studies*, 71(2), 139–154.
- Cahu, P., Fall, F., & Pongou, R. (2014). Beauty, Polygyny and fertility: Theory and Evidence. *Documents de Travail Du Centre d’Economie de La Sorbonne*.
- Calvès, A.-E. (1999). Marginalization of African single mothers in the marriage market: Evidence from Cameroon. *Population Studies*, 53(3), 291–301.
- Casterline, J. B. (2017). Prospects for fertility decline in Africa. *Population and Development Review*, 43, 3–18. <https://doi.org/10.1111/padr.12055>
- Casterline, J. B., & Agyei-Mensah, S. (2017). Fertility desires and the course of fertility decline in Sub-Saharan Africa. *Population and Development Review*, 43, 84–111. <https://doi.org/10.1111/padr.12030>
- Cherlin, A. J. (2014). First union patterns around the world: Introduction to the special issue. *Population Research and Policy Review*, 33(2), 153–159.
- Chojnacka, H. (1995). The role of nuptiality in the demographic transition. The case of Africa: A conceptual essay. *Genus*, 117–150.
- Chola, M., & Michelo, C. (2016a). Examining underlying determinants of fertility rates in

- Zambia: Evidence from the 2007 Zambia Demographic and Health Survey. *African Population Studies*, 30(2).
- Chola, M., & Michelo, C. (2016b). Proximate determinants of fertility in Zambia: Analysis of the 2007 Zambia Demographic and Health Survey. *International Journal of Population Research*, 2016(4), 1–7. <https://doi.org/10.1155/2016/5236351>
- Chuks, J. (2002). Ghana's reproductive revolution: Analysis of the determinants of fertility transition. *African Population Studies*, 17(No. 1), 47–67.
- Clark, S., Koski, A., & Smith-Greenaway, E. (2017). Recent trends in premarital fertility across Sub-Saharan Africa. *Studies in Family Planning*, 48(1), 3–22.
- Cohen, B. (1993). *Fertility levels, differentials, and trends*. (K. A. Foote, K. H. Hill, & L. G. Martin, Eds.), *Demographic change in Sub-Saharan Africa*. National Academies Press.
- Defo, K. B. (2014). Demographic, epidemiological, and health transitions: Are they relevant to population health patterns in Africa? *Global Health Action*, 7, 22443. <https://doi.org/10.3402/gha.v7.22443>
- Desgrées du Lou, A. (2000). The use of induced abortion in Abidjan: A possible cause of the fertility decline? *Population: An English Edition*, 4, 197–214. Retrieved from <http://www.jstor.org/stable/3030248>
- Engelen, T., & Kok, J. (2002). Permanent celibacy and late marriage in the Netherlands. *Population (English Edition)*, 58(1), 67–95. <https://doi.org/10.3917/pope.301.0067>
- Ezeh, A. C., Mberu, B. U., & Emina, J. O. (2009). Stall in fertility decline in Eastern African countries: regional analysis of patterns, determinants and implications. *Philosophical Transactions of the Royal Society B: Biological Sciences*, 364(1532), 2991–3007.
- Favour Chizomam, N. L., & Isiugo-Abanihe, U. (2013). Determinants of singlehood: A retrospective account by older single women in Lagos, Nigeria. *Etude de La Population Africaine*, 27(2 SUPPL.), 386–397. <https://doi.org/10.11564/27-2-483>
- Gaisie, S. (2005). Fertility trend in Ghana. *African Population Studies*, 20(2), 1–24.
- Garenne, M. (2004). Age at marriage and modernisation in Sub-Saharan Africa. *Southern African Journal of Demography*, 9(2), 59–79. <https://doi.org/10.2307/20853271>
- Garenne, M. (2009). Situations of fertility stall in Sub-Saharan Africa. *African Population Studies*, 23(2)(2), 173–188. Retrieved from <https://tspace.library.utoronto.ca/bitstream/1807/49234/1/ep08010.pdf>
- Garenne, M. (2011). Testing for fertility stalls in demographic and health surveys. *Population Health Metrics*, 9(1), 59. <https://doi.org/10.1186/1478-7954-9-59>
- Garenne, M. (2014). *Trends in marriage and contraception in Sub-Saharan Africa: A longitudinal perspective on factors of fertility decline*. Rockville Maryland ICF International MEASURE DHS 2014 Jan.
- Garenne, M. (2016). Dynamics of marriage and infertility in South Africa An analysis of census data. *African Population Studies*, 30(2).

- Garenne, M. M. (2008). *Fertility changes in Sub-Saharan Africa*. Calverton Maryland: Macro International 2008 Sep.
- Garenne, M., Tollman, S., Kahn, K., Collins, T., & Ngwenya, S. (2001). Understanding marital and premarital fertility in rural South Africa. *Journal of Southern African Studies*, 27(2), 277–290. <https://doi.org/10.1080/03057070125205>
- Garenne, M., & Zwang, J. (2006). Premarital fertility and ethnicity in Africa.
- Gerland, P., Biddlecom, A., & Kantorová, V. (2017). Patterns of fertility decline and the impact of alternative scenarios of future fertility change in Sub-Saharan. *Population and Development Review*, 43, 21–38. <https://doi.org/10.1111/padr.12011>
- Ghana Statistical Service. (2005). Population Data Analysis Reports Volume 1: Socio-Economic and Demographic Trends Analysis, (August), 226.
- Ghana Statistical Service. (2013). *Population & housing census report: Women & men in Ghana*. Accra: Ghana Statistical Service.
- Ghana Statistical Service (GSS), Ghana Health Service (GHS), ICF International. (2015). *Ghana demographic and health survey 2014*. Rockville, Maryland:USA: GSS, GHS, and ICF International.
- Ghana Statistical Service (GSS), Ghana Health Service (GHS), Macro International. (2009). *Ghana demographic and health survey 2008 - Final Report*. Calverton, MD: Macro International.
- Ghana Statistical Service (GSS), Noguchi Memorial Institute for Medical Research (NMIMR), and O. M. (2004). *Ghana demographic and health survey 2003*. Calverton, Maryland.
- Ghana Statistical Service (GSS) and Macro International Inc. (1999). *Ghana demographic and health survey 1998*. Calverton, Maryland.
- Ghana Statistical Service (GSS), Macro International (MI). (1989). *Ghana demographic and health survey 1988*. Calverton, Maryland.
- Ghana Statistical Service (GSS), M. I. I. (MI). (1994). *Ghana demographic and health survey 1993*. Calverton, Maryland.
- Government of Ghana. (1994). *National population policy (revised edition, 1994)*. Accra: National Population Council.
- Gubhaju, B., Jongstra, E., & Raikoti, M. (2014). Below-replacement fertility of ethnic Indians in Fiji: A decomposition analysis of the components of changes in the total fertility rate. *Journal of Population Research*, 31(4), 269–286.
- Guillaume, A., & Ltd., A. (2003). The role of abortion in the fertility transition in Abidjan (Côte d'Ivoire) during the 1990s. *Population (English Edition, 2002-)*, 58(6), 657–685. <https://doi.org/10.2307/3246670>
- Gupta, P. Das. (1993). *Standardization and decomposition of rates: A user's manual*. US Department of Commerce, Economics and Statistics Administration, Bureau of the Census.

- Gurmu, E., & Etana, D. (2014). Age at first marriage and first birth interval in Ethiopia: Analysis of the roles of social and demographic factors, 28(3), 1332–1344.
- Harwood-Lejeune, A. (2001). Rising Age at Marriage and Eastern Africa and Fertility in Southern. *European Journal of Population*, 17(3), 261–280.
- Hattori, M., & Larsen, U. (2007). Motherhood status and union formation in Moshi, Tanzania 2002–2003. *Population Studies*, 61(2), 185–199.
- Heaton, T. B. (2011). Does religion influence fertility in developing countries. *Population Research and Policy Review*, 30(3), 449–465.
- Henrich, J., Boyd, R., & Richerson, P. J. (2012). The puzzle of monogamous marriage. *Philosophical Transactions of the Royal Society B: Biological Sciences*, 367(1589), 657–669. <https://doi.org/10.1098/rstb.2011.0290>
- Hertrich, V. (2017). Trends in age at marriage and the onset of fertility transition in Sub-Saharan Africa. *Population and Development Review*, 43(S1), 112–137. <https://doi.org/10.1111/padr.12043>
- Hossain, F., & Karim, R. (2013). Determination of total fertility rate of Bangladesh using Bongaarts model. *Journal of Biometrics & Biostatistics*, 4(5), 1–4.
- Isiugo-Abanihe, U. C. (1994). *Nuptiality patterns sexual activity and fertility in Nigeria*. Calverton Maryland Macro International 1994 Dec.
- Islam, M. M. (2017). Rapid fertility decline in Oman: Understanding the role of proximate determinants. *Middle East Fertility Society Journal*, 22(4), 275–284.
- Jones, G. W., & Gubhaju, B. (2009). Factors influencing changes in mean age at first marriage and proportions never marrying in the low-fertility countries of East and Southeast Asia. *Asian Population Studies*, 5(3), 237–265. <https://doi.org/10.1080/17441730903351487>
- Kabagenyi, A., Reid, A., Rutaremwa, G., Atuyambe, L. M., & Ntozi, J. P. M. (2015). Has Uganda experienced any stalled fertility transitions? Reflecting on the last four decades (1973–2011). *Fertility Research and Practice*, 1(1), 14.
- Kirk, D., & Pillet, B. (1998). Fertility levels, trends, and differentials in sub-Saharan Africa in the 1980s and 1990s. *Studies in Family Planning*, 1–22.
- Kitagawa, E. M. (1955). Components of a difference between two rates. *Journal of the American Statistical Association*, 50(272), 1168–1194.
- Koski, A., Clark, S., & Nandi, A. (2017). Has child marriage declined in Sub-Saharan Africa? An analysis of trends in 31 countries. *Population and Development Review*, 43(1), 7–29. <https://doi.org/10.1111/padr.12035>
- Kwankye, S. O., & Cofie, E. (2015). Ghana's population policy implementation: Past, present and future. *African Population Studies*, 29(2).
- Lardoux, S., & Walle, E. Van de. (2003). Polygyny and fertility in rural Senegal. *Population (English Edition)*, 58(6), 717–743. <https://doi.org/10.2307/3246672>
- Lardoux, Solène, & Van de Walle, E. (2003). Polygyny and fertility in rural Senegal.

Population (English Edition), 717–743.

- Lindstrom, D. P., & Woubalem, Z. (2003). The demographic components of fertility decline in Addis Ababa, Ethiopia: a decomposition analysis. *Genus*, 147–158.
- MacQuarrie, K. (2016). *Marriage and fertility dynamics: The influence of marriage age on the timing of first birth and birth spacing*. ICF International.
- Marston, M., Slaymaker, E., Cremin, I., Floyd, S., McGrath, N., Kasamba, I., ... Zaba, B. (2009). Trends in marriage and time spent single in Sub-Saharan Africa: A comparative analysis of six population-based cohort studies and nine Demographic and Health Surveys. *Sexually Transmitted Infections*, 85(Suppl 1), i64–i71. <https://doi.org/10.1136/sti.2008.034249>
- Marston, Milly, Slaymaker, E., Cremin, I., Floyd, S., McGrath, N., Kasamba, I., ... Mupambireyi, Z. (2009). Trends in marriage and time spent single in Sub-Saharan Africa: a comparative analysis of six population-based cohort studies and nine Demographic and Health Surveys. *Sexually Transmitted Infections*, 85(Suppl 1), i64–i71.
- Meekers, D. (1994). Sexual initiation and premarital childbearing in Sub-Saharan Africa. *Population Studies*, 48(1), 47–64.
- Mensch, B. S., Grant, M. J., & Blanc, A. K. (2006). The changing context of sexual initiation in Sub-Saharan Africa. *Population and Development Review*, 32(4), 699–727. <https://doi.org/10.1111/j.1728-4457.2006.00147.x>
- Mensch, B. S., Singh, S., & Casterline, J. B. (2005). Trends in the timing of first marriage among men and women in the developing world. *The Changing Transitions to Adulthood in Developing Countries: Selected Studies*, 118–171.
- Mills, M., Rindfuss, R. R., McDonald, P., & Te Velde, E. (2011). Why do people postpone parenthood? Reasons and social policy incentives. *Human Reproduction Update*, 17(6), 848–860.
- Morgan, S. P., & Teachman, J. D. (1988). Logistic regression: description, examples, and comparisons. *Journal of Marriage and the Family*. <https://doi.org/10.2307/352104>
- Muraco, J. a., & Curran, M. a. (2012). Associations between marital meaning and reasons to delay marriage for young adults in romantic relationships. *Marriage & Family Review*, 48(3), 227–247. <https://doi.org/10.1080/01494929.2012.665013>
- Nahar, M. Z., Zahangir, M. S., & Islam, S. M. S. (2013). Age at first marriage and its relation to fertility in Bangladesh. *Chinese Journal of Population Resources and Environment*, 37–41. <https://doi.org/10.1080/10042857.2013.835539>
- Nai Peng, T. (2007). Trends in delayed and non-marriage in Peninsular Malaysia. *Asian Population Studies*, 3(3), 243–261. <https://doi.org/10.1080/17441730701746391>
- Nalwadda, G., Mirembe, F., Byamugisha, J., & Faxelid, E. (2010). Persistent high fertility in Uganda: Young people recount obstacles and enabling factors to use of contraceptives. *BMC Public Health*, 10(1), 530. <https://doi.org/10.1186/1471-2458-10-530>
- Nonvignon, J., & Novignon, J. (2014). Trend and determinants of contraceptive use among women of reproductive age in Ghana. *Etude de La Population Africaine*, 28(2), 956.

- Ntoimo, L. F., & Isiugo-Abanihe, U. (2014). Determinants of singlehood: A retrospective account by older single women in Lagos, Nigeria. *Etude de La Population Africaine*, 27(2), 386.
- Ntoimo, L. F., & Odimegwu, C. O. (2014). Health effects of single motherhood on children in sub-Saharan Africa: a cross-sectional study. *BMC Public Health*, 14(1), 1145. <https://doi.org/10.1186/1471-2458-14-1145>
- Obeng, S., Jones, G., & Baffour, K. A. (2012). Religion, contraception, and method choice of married women in Ghana, 1359–1374. <https://doi.org/10.1007/s10943-011-9478-4>
- Odimegwu, C. obby, & Zerai, A. (1996). Understanding the proximate determinants of fertility of a Nigerian ethnic group. *Genus*, 67–87.
- Ortega, J. A. (2014). A characterization of world union patterns at the national and regional level. *Population Research and Policy Review*, 33(2), 161–188.
- Ozalp, S., Tanir, H. M., Sener, T., Yazan, S., & Keskin, A. E. (2003). Health risks for early (≤ 19) and late (≥ 35) childbearing. *Archives of Gynecology and Obstetrics*, 268(3), 172–174.
- Palamuleni, M. E. (2011). Decomposition of South African crude birth rates. *Southern African Journal of Demography*, 37.
- Parr, N. J. (1998). Changes in the factors affecting fertility in Ghana during the early stages of the fertility decline. *Genus*, 77–86.
- Rabbi, A. M. F., & Kabir, M. (2015). Explaining fertility transition of a developing country: an Analysis of quantum and tempo effect. *Fertility Research and Practice*, 1(1), 4.
- Reda, A. A., & Lindstrom, D. (2014). Recent trends in the timing of first sex and marriage among young women in ethiopia. *African Population Studies*, 28(2), 1157–1170. <https://doi.org/10.11564/28-0-564>
- Retherford, R. D., & Ogawa, N. (1978). Decomposition of the change in the total fertility rate in the Republic of Korea, 1966–1970. *Social Biology*, 25(2), 115–127.
- Retherford, R. D., & Rele, J. R. (1989). A decomposition of recent fertility changes in South Asia. *Population and Development Review*, 15(4), 739–747. Retrieved from <http://www.jstor.org/stable/1972598>
- Retherford, R. D., & Thapa, S. (2004). Recent Trends and Components of Change in Fertility in Nepal. *Journal of Biosocial Science*, 36(6), 709–734. <https://doi.org/10.1017/S0021932003006448>
- Sayi, T. S. (2014). Relationships between marriage and fertility transitions in Sub-Saharan Africa. In *2014 Annual Meeting*. Boston: Population Association of America.
- Schoumaker, B. (2013). A Stata module for computing fertility rates and TFRs from birth histories: tfr2. *Demographic Research*, 28, 1093–1144.
- Shah, I. H., & Singh, S. (1985). Levels trends and differentials in fertility. In *Demographic Patterns in Ghana:evidence from the Ghana Fertility Survey 1979-80*. Voorburg Netherlands International Statistical Institute 1985.

- Shakya, K., & Gubhaju, B. (2016). Factors contributing to fertility decline in Nepal. *Journal of Population and Social Studies*, 24(1), 13–29.
- Shapiro, D., & Gebreselassie, T. (2013). Fertility transition in Sub-Saharan Africa: falling and stalling. *African Population Studies*, 23(1).
- Shapiro, D., & Gebreselassie, T. (2014). Marriage in Sub-Saharan Africa: Trends, determinants, and consequences. *Population Research and Policy Review*, 33(2), 229–255.
- Sibanda, A., Woubalem, Z., Hogan, D. P., & Lindstrom, D. P. (2003). The proximate determinants of the decline to below-replacement fertility in Addis Ababa, Ethiopia. *Studies in Family Planning*, 34(1), 1–7.
- Singh, S., Bankole, A., & Darroch, J. E. (2017). The impact of contraceptive use and abortion on fertility in Sub-Saharan Africa: Estimates for 2003–2014. *Population and Development Review*, 43, 141–165. <https://doi.org/10.1111/padr.12027>
- Smith-Greenaway, E., & Clark, S. (2018). Women’s marriage behavior following a premarital birth in Sub-Saharan Africa. *Journal of Marriage and Family*, 80(1), 256–270. <https://doi.org/10.1111/jomf.12433>
- Subaiya, L., & Johnson, K. (2008). Whats in the gap?: factors associated with the interval between age at first sex and age at first marriage in Cameroon and their implications for reproductive health and womens empowerment.
- Tabutin, D., & Schoumaker, B. (2004). The demography of Sub-Saharan Africa from the 1950s to the 2000s: A survey of changes and a statistical assessment. *Population (English Edition)*, 59(3), 455. <https://doi.org/10.3917/pope.403.0455>
- Takyi, B. K., & Addai, I. (2002). Religious affiliation, marital processes and women’s educational attainment in a developing society. *Sociology of Religion*, 63(2), 177–193.
- Tawiah, E. O. (1984). Determinants of cumulative fertility in Ghana. *Demography*, 21(1), 1–8. <https://doi.org/10.2307/2061022>
- Timæus, I. M., & Reynar, A. (1998). Polygynists and their wives in Sub-Saharan Africa: An analysis of five Demographic and Health Surveys. *Population Studies*, 52(2), 145–162.
- Tsui, A. O., Brown, W., & Li, Q. (2017). Contraceptive Practice in Sub-Saharan Africa. *Population and Development Review*, 43, 166–191. <https://doi.org/10.1111/padr.12051>
- Tutu, R. A. (2011). Ghana’s demographic transition: The role of induced abortion and reproductive health ramifications. *West Africa Review*, (19).
- United Nations Dept of International Economic and Social Affairs. (1988). *First marriage: Patterns and determinants*. New York: United Nations.
- Vaupel, J. W., & Romo, V. C. (2002). Decomposing demographic change into direct vs. compositional components. *Demographic Research*, 7, 1–14.
- Weeks, J. R., Getis, A., Hill, A. G., Agyei-Mensah, S., & Rain, D. (2010). Neighborhoods and fertility in Accra, Ghana: An AMOEBA-based approach. *Annals of the Association of American Geographers*, 100(3), 558–578.

Westoff, C. F. (2003). Trends in marriage and early childbearing in developing countries.

Westoff, C. F., Bietsch, K., & Koffman, D. (2013). Indicators of trends in fertility in Sub-Saharan Africa. *DHS Analytical Surveys No. 34*, (August). Retrieved from <http://dhsprogram.com/pubs/pdf/AS34/AS34.pdf>

Westoff, C. F., Blanc, A. K., & Nyblade, L. (1994). *Marriage and entry into parenthood*. Calverton Maryland: Macro International 1994 Mar.

Zwang, J. (2004). Perceptions and attitudes towards late marriage and premarital fertility in rural South Africa. *IFAS Working Paper Series/Les Cahiers de l'IFAS*, 4, 61p.

APPENDICES

APPENDIX A

PROCEDURE FOR COMPUTATION OF SINGULATE MEAN AGE MARRIAGE

The procedure for the calculation of SMAM was adopted from *Annex 1 of Manual X, indirect techniques for Demographic Estimation, New York: United Nations, 1983, pp. 225-229*

Step 1: Calculation of proportions never married for each age group.

Divide the number single in each age group by the total population in the same age group.

The resulting proportion for an age group is denoted by $U_{(1-7)}$, with from 1 to 7 referring to the number of age groups from (15 – 19) to (45 to 49).

Table 1 Proportions never married and ever married

U	age in 5-year groups	Never married	Ever married	Total	Proportion never married (U_{1-7})
1	15-19	642	206	848	0.75708
2	20-24	196	671	867	0.22607
3	25-29	39	828	867	0.04498
4	30-34	8	636	644	0.01242
5	35-39	3	528	531	0.00565
6	40-44	1	363	364	0.00275
7	45-49	0	366	366	0.00000
	Total	889	3598	4487	0.19813

Step 2: Calculation of person-years lived in the single state.

Add the proportions single in each age group up to and including that for the age group 45 – 44 (i-6) and multiply the sum by 5.

The resulting quantity is denoted by RS_1 .

Let $RS_2 = RS_1 + 15$

The quantity 15 is the number of person – years lived in the single state from birth to age 15 by the hypothetical cohort of size being considered.

U	Age group	Proportion never married (U_{1-7})
1	15-19	0.757075
2	20-24	0.226067
3	25-29	0.044983
4	30-34	0.012422
5	35-39	0.00565
6	40-44	0.002747
7	45-49	0.00000
		1.048944

$$RS_1 = 1.048944 * 5$$

$$5.24472199$$

Let $RS_2 = RS_1 + 15.0$

The quantity 15 is the number of person – years lived in the single state from birth to age 15 by the hypothetical cohort of size being considered.

$$RS_2 = 5.24472199 + 15$$

$$\mathbf{20.24472199}$$

Step 3: Estimation of proportion who ever marry.

The proportion remaining single by age 49 is estimated as

$$RN = (U_6 + U_7) / 2 \dots\dots\dots (1)$$

where (U_6) is the proportion never married among those age 40 – 44 and (U_7) is the equivalent proportion among those age 45-49.

$$(0.002747253 + 0.0000)/2 = 0.001373626$$

The proportion ever marrying at age 50 then becomes the complement of RN

$$RM = 1.0 - RN \dots\dots\dots (2)$$

$$1.0 - 0.001373626 = 0.998626374$$

$$RM = 0.998626374$$

Step 4: Calculation of number of person – years lived by the proportion not marrying.

Since RN is estimated to be the proportion who have not married by age 50, the total time spent in the single state by this proportion is

$$RS_3 = 50 * RN \dots\dots\dots (3)$$

$$50 * 0.001373626 = 0.068681319$$

$$RS_3 = 0.068681$$

Step 5: Calculation of singulate mean age at marriage.

$$SMAM = (RS_2 + RS_3) / RM \dots\dots\dots(4)$$

$$(20.24472199 + 0.068681) / 0.998626374$$

$$= 20.20379314$$

SMAM for 1988 = 20.2 years.

COMPUTATION OF FOR SMAM for 2014

Table 2 Proportion never married and ever married, 2014

age in 5-year groups	Never married	Ever married	Total	Proportion never married
15-19	1507	118	1625	0.927385
20-24	934	678	1612	0.579404
25-29	435	1170	1605	0.271028
30-34	136	1236	1372	0.099125
35-39	59	1236	1295	0.04556
40-44	14	1016	1030	0.013592
45-49	8	849	857	0.009335
Total	3093	6303	9396	0.329183

$$RS1 = 1.936095 * 5$$

$$9.680473$$

$$RS2 = 9.680473 + 15$$

$$24.68047$$

$$RN = (U_6 + U_7) / 2$$

$$(0.013592 + 0.009335) / 2$$

$$0.011464$$

$$RM = 1.0 - RN$$

$$1.0 - 0.011464$$

$$0.988536$$

$$RS_3 = 50 * RN$$

$$50 * 1.0 - 0.011464 = 0.573178$$

$$SMAM = (RS_2 + RS_3) / RM$$

$$(24.68047 + 0.573178) / 0.988536$$

$$= 24.38685$$

$$SMAM \text{ for } 2014 = 24.4 \text{ years}$$

APPENDIX B

Estimates of ASFRs/TFRs for all women 15-49, Ghana 1988 GDHS using stata module TFR2

tabexp(Table of exposure generated from stsata module tfr2)

weight variable is v005

Preparing table of events and exposure for 3 year(s) preceding the survey

Period covered: 3/1985 to 2/1988

Central date is 1986.7247

Number of cases (women): 4477

Number of person-years (weighted): 12635.083

Number of events (weighted): 2583

period	Age	events	exposure	centry
0	15	326	2615.167	1986.725
0	20	693	2662.917	1986.725
0	25	697	2487.833	1986.725
0	30	446	1789.75	1986.725
0	35	263	1392.083	1986.725
0	40	115	985.0833	1986.725
0	45	43	702.25	1986.725

weight variable is v005

Preparing table of events and exposure for 3 year(s) preceding the survey

Period covered: 3/1985 to 2/1988

Central date is 1986.7247

Number of cases (women): 4477

Number of person-years (weighted): 12635.083

Number of events (weighted): 2583

ASFRs - TFR

events	Coef.	Std.er	z	P> z	[95% Conf.Int	
Rate_1519	0.125	0.007	18.06	0.000	0.111	0.138
Rate_2024	0.260	0.010	26.32	0.000	0.241	0.280
Rate_2529	0.280	0.011	26.4	0.000	0.259	0.301
Rate_3034	0.249	0.012	21.12	0.000	0.226	0.272
Rate_3539	0.189	0.012	16.22	0.000	0.166	0.212
Rate_4044	0.117	0.011	10.72	0.000	0.095	0.138
Rate_4549	0.061	0.009	6.56	0.000	0.043	0.080
TFR	6.406	0.136	47.14	0.000	6.139	6.672

Estimating mean age at childbearing for 1988

1	2	3	4	5	6	7	8	9	10
ages		Events B_a	Exposure E_a		ASFR	CASFR	% in age	Cum % in Age	
15-19	17.5	326	2615.167	0.125	0.623	0.623	9.7	9.7	170.3
20-24	22.5	693	2662.917	0.260	1.301	1.924	20.3	30.0	457.0
25-29	27.5	697	2487.833	0.280	1.401	3.325	21.9	51.9	601.4
30-34	32.5	446	1789.75	0.249	1.246	4.571	19.5	71.4	632.1
35-39	37.5	263	1392.083	0.189	0.945	5.516	14.7	86.1	553.0
40-44	42.5	115	985.0833	0.117	0.584	6.100	9.1	95.2	387.3
45-49	47.5	43	702.25	0.061	0.306	6.406	4.8	100.0	227.0
TFR					6.406				3028.0
MAC									30.3

Illustration of the procedure for computing selected indicators of fertility

Column		Computation procedure
1	Age group of women	
2	Midpoint of age interval	
3	Events/ birth to mothers of age group	
4	number of person-years of exposure in age group a during three years preceding each survey	
5		Entry in col 3 divided by entry same row of col 4 multiplied by 5
6	ASFR	Entry in Col 5 multiplied by 5 $ASFR_a = (B_a/E_a) * 5$
7	Cumulative Age Specific fertility rate CASFR (fertility expected by this age)	Cumulative additions of entries in Col 6
8	Percent distribution of TFR to age	Row of ASFR divided by TFR for each age group
9	Percent distribution cumulative to age	Cumulative additions of entries in Col 8
10	Computing Mean Age at Childbearing	Col (2) *Col 8
	TFR	Summation of column 6
	Mean age at Childbearing	This is obtained by multiplying of the percentage of total births that occur at each age interval by midpoint of that interval, then sum of the products obtained across all internals and dividing the results total by 100.

APPENDIX C

COMPUTATION OF COMPONENTS OF CHANGE IN OVERALL TFR BETWEEN PERIOD 1 AND PERIOD 2

If $TFR = 5 \sum_x (K_{xm} F_{xm} + K_{xn} F_{xn}) \dots\dots\dots (1)$

F_{xm} is the age specific fertility rate for ever married women Column 1

F_{xn} is the age specific fertility rate for never married women

K_{xm} is the age specific proportions of women ever married and this represents the weight for the ever married women

K_{xn} is the age specific proportions of never married women and this represents the weight for never married women

Age specific marital, never marital, proportion married, never married for 1988 and 2014

	1988 t1		2014 t2		1988 t1		2014 t2	
Age group	ASEMR	ASNFR	ASMFR	ASNFR	ASPEM	ASPNM	ASPEM	ASPNM
	COL 1	COL 2	COL 3	COL 4	COL 5	COL 6	COL 7	COL 8
	Fm ₁	Fn ₁	Fm ₂	Fn ₂	Km ₁	Kn ₁	Km ₂	Kn ₂
15-19	0.32189	0.02834	0.318	0.039	0.243	0.757	0.073	0.927
20-24	0.30599	0.06833	0.287	0.048	0.774	0.226	0.421	0.579
25-29	0.28907	0.04282	0.253	0.044	0.955	0.045	0.729	0.271
30-34	0.25141	0.00000	0.214	0.029	0.988	0.012	0.901	0.099
35-39	0.18957	0.00000	0.138	0.042	0.995	0.006	0.954	0.046
40-44	0.11724	0.00000	0.052	0.015	0.998	0.003	0.986	0.014
45-49	0.06123	0.00000	0.017	0.000	1.000	0.000	0.991	0.009

The change in total fertility rate ΔTFR from period t_1 to period t_2 is as follows;

$$\begin{aligned} \Delta TFR &= 5 \sum_x \frac{1}{2} (F_{xm}^{(t_2)} + F_{xm}^{(t_1)}) (k_{xm}^{(t_2)} - k_{xm}^{(t_1)}) && \text{[change in proportion married]} \\ &+ 5 \sum_x \frac{1}{2} (F_{xn}^{(t_2)} + F_{xn}^{(t_1)}) (k_{xn}^{(t_2)} - k_{xn}^{(t_1)}) && \text{[change in proportion never married]} \\ &+ 5 \sum_x \frac{1}{2} (k_{xm}^{(t_2)} + k_{xm}^{(t_1)}) (F_{xm}^{(t_2)} - F_{xm}^{(t_1)}) && \text{[change in marital fertility]} \\ &+ 5 \sum_x \frac{1}{2} (k_{xn}^{(t_2)} + k_{xn}^{(t_1)}) (F_{xn}^{(t_2)} - F_{xn}^{(t_1)}) && \text{[change in never married fertility]} \end{aligned}$$

This formula was applied as follows

$$\begin{aligned} \text{COL A} &= 5 * (((\text{COL 3} + \text{COL 1}) / 2) * (\text{COL 7} - \text{COL 5})) && \text{[change in proportion married]} \\ \text{COL B} &= 5 * (((\text{COL 4} + \text{COL 2}) / 2) * (\text{COL 8} - \text{COL 6})) && \text{[change in proportion married]} \\ \text{COL C} &= 5 * (((\text{COL 5} + \text{COL 7}) / 2) * (\text{COL 3} - \text{COL 1})) && \text{[change in marital fertility]} \\ \text{COL D} &= 5 * (((\text{COL 8} + \text{COL 6}) / 2) * (\text{COL 4} - \text{COL 2})) && \text{[change in never married fertility]} \\ \text{COL E} &= \text{SUM} (\text{COL A} + \text{COL B} + \text{COL C} + \text{COL D}) && \text{[overall change in TFR]} \end{aligned}$$

Changes in marital, never marital, proportion married, never married for 1988 and 2014

	Change in marital fertility	Change in never marital fertility	Change in Proportion ever married	Change in Proportion never married	Change in over all TFR
Age Group	COL A	COL B	COL C	COL D	COL E
15-19	-0.27	0.03	0.00	0.05	-0.20
20-24	-0.52	0.10	-0.06	-0.04	-0.52
25-29	-0.31	0.05	-0.15	0.00	-0.41
30-34	-0.10	0.01	-0.18	0.01	-0.26
35-39	-0.03	0.00	-0.25	0.01	-0.27
40-44	-0.01	0.00	-0.32	0.00	-0.33
45-49	0.00	0.00	-0.22	0.00	-0.22
TFR Change	-1.24	0.19	-1.18	0.02	-2.21
% change	56.2	-8.6	53.3	-0.9	100.00