Title: The stalling fertility transition in Ghana: Does the changing proportion of never married women matter?

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ABSTRACT

Objectives: Ghana's fertility transition has been characterized by stalling in recent decades. which defies research-driven explanation, and quite contrary to our understanding of the Demographic Transition Theory. This study examines the contribution of changes in the proportion of ever-married and never-married women to the stalling fertility in Ghana.

Methodology: This study uses a decomposition analysis to examine how the changes in the proportion of married women based on the 1984-2014 Ghana Demographic and Health Surveys could account for the stalling fertility in the country.

Results: The results reveal that decreasing proportions of ever-married women in Ghana are fundamental in accounting for fertility decline in the country. However, the increase in the fertility of never-married women offsets the pace of overall fertility decline, hence the stalling. **Conclusion:** Childbearing before marriage is important in understanding Ghana's fertility transition and should be accounted for in studies on fertility transition in sub-Saharan Africa.

Keywords: Fertility Transition, decomposition, never married fertility, marital structure, Ghana

Titre: La stagnation de la transition de la fécondité au Ghana: l'évolution de la proportion de femmes jamais mariées est-elle importante?

RÉSUMÉ

Objectifs : La transition de la fécondité au Ghana s'est caractérisée par un ralentissement au cours des dernières décennies, ce qui défie toute explication conventionnelle et est bien contraire à notre interprétation de la théorie de la transition démographique. Cette étude examine la contribution des changements dans la proportion de femmes toujours mariées et jamais mariées à la baisse de la fécondité au Ghana.

Méthodologie : Cette étude utilise une analyse de décomposition pour examiner comment les changements dans la proportion de femmes mariées basés sur les enquêtes démographiques et de santé du Ghana de 1984-2014 pourraient expliquer la stagnation de la fécondité dans le pays.

Résultats : Les résultats révèlent que la diminution de la proportion de femmes toujours mariées au Ghana est fondamentale pour expliquer le déclin de la fécondité dans le pays. Cependant, l'augmentation de la fécondité des femmes jamais-mariées compense le rythme de la baisse générale de la fécondité, donc la stagnation.

Conclusion : La procréation avant le mariage est importante pour comprendre la transition de la fécondité au Ghana et devrait être prise en compte dans les études sur la transition de la fécondité en Afrique subsaharienne.

Introduction

Globally, the age at which people enter first union has increased in many regions of the world in recent years (Muraco and Curran, 2012; Cherlin, 2014; 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 global level by an average of two years since the 1970s. The postponement is evidenced by the fact that many women are now entering 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 influences on fertility transitions. There is also evidence that rising ages at first marriage alone contributed to about 42 percent of the fertility decline in Addis Ababa between 1990 and 2000 (Lindstrom and 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 0.73 years and a further 0.20 reduction in the number of children ever born. Changes in the timing of first marriages, therefore, could provide some explanation on 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 is the focus of this study.

Previous studies on fertility transition in Ghana (Parr, 1998; Chuks, 2002; Tutu, 2011) have 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 only on the currently married, to the neglect of the never married. Meanwhile, current literature points to increasing proportions of never married women having children, 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 married fertility rates are rare in Ghana. Hence, a study that seeks to examine the influence of marriage and childbearing on Ghana's stalling fertility requires techniques that incorporate the relative contributions of changes in age-specific proportions of marital structure as well as changes in marital and never married fertility rates. This study is an attempt to address these knowledge gaps.

The impact of the changes in the proportion marrying as well as changes in marriage timing on fertility have rarely been examined in the context of Ghana's fertility transition. It has been asserted that postponement of first marriage to 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 the case has been rarely investigated in Ghana. Relatively, not much is known about changes in total fertility having been caused by changes in age composition of the marital structure, changes in marital fertility or changes in never marital fertility. . It has, however, been established that changes in the age composition of the proportion of never married women has been occurring as a result of shift in the ages at first marriage, changes in marital and never married fertility has been noticed, but the overall effect of these changes on fertility change is not clear.

Ghana, located in the West African sub-region is one of the fastest growing populations in the sub-region. The population of the country increased rapidly over the years from 6.7 million in 1960 to 24.7 million in 2010 and currently estimated to around 29.0 million in 2019. With a current population growth rate of 2.5 percent per annum, the population is expected to double in 28 years with fertility and mortality being the key components of population change.

Ghana's Population Policy (1994 revised edition) had a goal to reduce the total fertility rate from 5.5 in 1998 to 4.0 by 2010 and 3.0 by 2020 (Government of Ghana, 1994). A fairly lower TFR of 4.0 children per woman was recorded in 2008 before the targeted year of 2010 and the rapid decline of total fertility from almost seven to four children per woman from the late 1970s to the mid-1990s has been a subject of great interest to demographers (Blanc & Grey, 2000). However, fertility decline has stalled

around four (4) births since 1998; hence, the possibility of achieving the TFR target of 3.0 by 2020 seems far from reality. Consequently, the extent to which the changes in the age composition or in the proportion of women never married and ever married influenced the fertility transition in Ghana is the subject of interest in 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 (ERP) that was launched in 1983, the Structural Adjustment Program in the 1990s (SAP) and Ghana Poverty Reduction Strategies 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 8.4 percent in 2008 (Kwankye and Cofie, 2015). These changes would most likely affect other social and demographic factors that will most likely affect marriage formation and total fertility.

Structurally, as per the demographic transition model, once birth rates begins to decline, it is expected to continue without much interruption until the replacement level of two births per woman is reached as witnessed by some developed countries. The observed trend in Ghana, however, has been different. The country's fertility rate which has been described as high and stable between six and seven children per woman in the 1960s and 1980s (Gaisie, 2005) declined rapidly in the 1990s and has

eventually stalled around four births since the 2000s. The stall in the fertility decline in Ghana and its dynamics as have been explained, needs further examination (Agyei-Mensah, 2007).

The timing of first marriages and marriage prevalence need research attention in order to appreciate the stalls in Ghana's fertility decline. Suggestively, changes in the age composition of the marriage structure together with dynamics of marital and non-marital fertility contribute in explaining the decline. It is evident that there has been a marked shift from early marriages toward delayed marriages in Ghana. 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 and makes this study both timely and important.

Literature Review and Theoretical Framework

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 section, provides an overview of previous studies that are relevant to this study as well as a description of conceptual issues that will define the context of this study.

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). Fertility transition is part of the broader concept of the 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, death rates and birth rates will decline from their 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).

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 receptive to large family sizes (Bongaarts, 2017; Casterline, 2017; Casterline and Agyei-Mensah, 2017). The decline was, therefore, linked to unreliable methods used to estimate fertility at different times (Garenne, 2009, 2011). 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 projected pro-natalism and lags in socio-economic developments (Cohen, 1993;

Casterline, 2017). 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 and Pillet, 1998). In their estimation, contraceptive use was the major proximate determinant that explained the fertility decline in SSA.

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 the1990s 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, that is, 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 at 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 (Bongaarts and Casterline, 2013; Bongaarts, 2017). The transition, on the other hand, was perceived by Bongaarts (2017) to be quite earlier than expected if Africa as a continent had followed the non African developing countries pattern of the transition due to its low level of development at the onset of the transition. Bongaarts (2017) attributed this assertion to the diffusion of ideas about birth control from other non-African countries.

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 the relationship between age at marriage and fertility (Garenne, 2014; Harwood-Lejeune, 2001; Hertrich, 2017) polygyny-fertility relationships (Henrich, Boyd & Richerson, 2012; Lardoux & Walle, 2003; Timæus & Reynar, 1998), the influence of changes in nuptiality on Africa's demographic transition (Chojnacka, 1995) and proportions married and fertility

(Shapiro and Gebreselassie, 2014). Yet many studies have examined marriage in the context of the proximate determinants of fertility change (Sibanda *et al.*, 2003; Tutu, 2011; Chola and Michelo, 2016). The role of changes in nuptiality patterns in the demographic transition of Africa between 1950 and 1985 has been described (Chojnacka, 1995). She observed that shifts towards later age at marriage acted as a major driver for the onset of demographic transition in Africa. She further noted that Northern and Southern African countries experienced the highest increase in age at first marriage compared to the other sub-regions. The lowest level of increase in age at first marriage was found in Western and Central Africa (Chojnacka, 1995). Hertrich (2017) also observed similar patterns three decades later. The median age at first marriage (MAFM) which was lower than 18 years about 50 years ago, currently exceed 25 years for the Southern African countries (Hertich, 2017). There is a growing evidence that delays in the transition to first marriage is currently almost widespread in SSA (Shapiro and Gebreselassie, 2014; Amoo, 2017; Hertrich, 2017; Koski, Clark and Nandi, 2017).

Several studies have illustrated the inverse relationship between age at first marriage and total fertility rate (Kirk and Pillet, 1998; Harwood-Lejeune, 2001; Hertrich, 2017). Countries with higher age at first marriage were observed to have the lower TFRs (Harwood-Lejeune, 2001; Kirk and Pillet, 1998). The implication is that the timing of first marriage has become the catalyst for fertility change in SSA (Harwood-Lejeune, 2001; Kirk and Pillet, 1998). Harwood-Lejeune (2001) observed that countries such as Botswana, Kenya and Zimbabwe, which had experienced a stable fertility decline, had a higher age at first marriage and a higher age of first birth.

Beside age at marriage, the proportion married is another nuptiality-related variable that affects fertility levels (Lindstrom and Woubalem, 2003; Shapiro and Gebreselassie, 2014; Avogo and Somefun, 2019). Marriage in SSA has been characterized as nearly universal, and every adult female is expected to marry at least once in her reproductive lifespan (Aryee, 1985; Awusabo-Asare, 1988). Childbearing is an expected role in marriage; hence, a higher proportion of the ever-married women will signify higher levels of fertility. Shapiro and Gebreselassie (2014), in describing the prevalence of marriage, note that Southern Africa countries recorded the lowest proportion of women in union , and with a corresponding lowest TFR, whilst the Sahelian countries had the highest proportion of currently married women as well as the highest TFR (Shapiro and Gebreselassie, 2014).

Shapiro and Gebreselassie's (2014) study on marriage in SSA further observed that significant changes have occurred among the proportion in union. with the highest decline occurring among women aged 15 – 19 years. In the study, 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.(Shapiro and Gebreselassie, 2014).

Shapiro and Gebreselassie (2014), however, restricted their study to women aged less than 30 years and also to only women who were currently married. The fertility experience of never married women and women aged more than 30 years were therefore ignored in their study. Though 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; Avongo and Somefun, 2019). Hence, a more comprehensive study that seeks to incorporate the never married role in the changing marriage patterns on fertility transition.

Decomposition of the components of change in total fertility rate

Decomposition refers to the process of separating a phenomenon into its basic parts to describe the contributions of each of the components to the overall change in the phenomenon being studied. (Kitagawa, 1955; Gupta, 1993; Lindstrom & Woubalem, 2003). In this regard, breaking down the changes in the population growth into its varied components (fertility, mortality and migration) over time Decomposition, 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 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 technique 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 (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, can be expressed as a function of proportions of women marrying, levels of married women's fertility as well as never-married women's fertility. Fertility of any specific age group is the product of the proportion of women married at that age and number of births to that same age group (Westoff et al., 1994 p.27). The implication is that changes in the proportions of ever married women and never married women coupled with changes in their respective fertility rates should have some influence on total fertility rate. Therefore, changes in overall fertility can be shown statistically 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 fertility 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 & Woubalem (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 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.

Tracing the relative contribution of ever and never married women would assist policymakers to formulate appropriate nuptiality, influencing policy and interventions to influence Ghana's fertility transition. Decomposition of the changes is deemed helpful in highlighting the quantum of change and the relative direction of the contribution of these components.

This study is 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

Data and Methods

This study is based on existing microlevel data from the Demographic and Health Surveys (DHS) conducted in Ghana from 1988 to 2014. The GDHS is a cross-sectional, nationally representative population-based sample survey of households and provides rich micro level data on reproductive health, mortality, health and nutrition of households and individuals.

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 et.al., 1989; 1994; 1999; 2004; 2009; 2015). All the surveys have been conducted by the same organisation and used similar data collection procedures. Therefore, the GDHS has a very rich comparable database for a study that seeks to analyse a long-term trend of fertility and nuptiality issues in Ghana over a thirty year period 1984-2014. The study population includes all women of reproductive age 15-49 years in the various rounds of the GDHS from 1988 to 2014. In all a total of 33,895 women have so far participated in the surveys since 1985. The unit of analysis is the individual woman of reproductive age.

These women were classified as never married and ever married 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 or in union (divorced, separated or widowed) at the time of the survey. Never married women, conversely, refers to women who have never entered into any marriage/union.

Total fertility rate was the main outcome variable for the description of fertility trends. 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.

The prevalence of marriage was examined by describing the levels, 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 group 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.

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 and subsequently having children would be negligible, 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

A decomposition technique was consequently used to determine the components of changes in Ghana's TFR due to three main components; marital structure, marital fertility and never married fertility over the survey periods, categorised as; 1988-1998 (rapid falling period), 1998-2008 (slow to stalling period) and 2008-2014 (reversals in decline).

The decomposition technique used, initially developed by Kitagawa (1955) and later adapted by Retherford and Ogawa (1978) and Lindstrom and Woubalem (2003). The technique was used to examine if the decline in fertility could be attributed to a decline in fertility among married women or increase in the fertility of never married 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 of the never married.

By definition, the Total Fertility Rate is given as:

$TFR = 5 \sum_x [(K_{xm} * F_{xm}) + (K_{xn} * F_{xn})]$ ………………………………………… (1)

where:

(TFR) is the weighted sum of age-specific fertility rates for the ever married women (ASMFR) and age-specific fertility rate for the never married women (ASNFR), additionally, ASMFR and ASNFR are further defined by the following:

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.

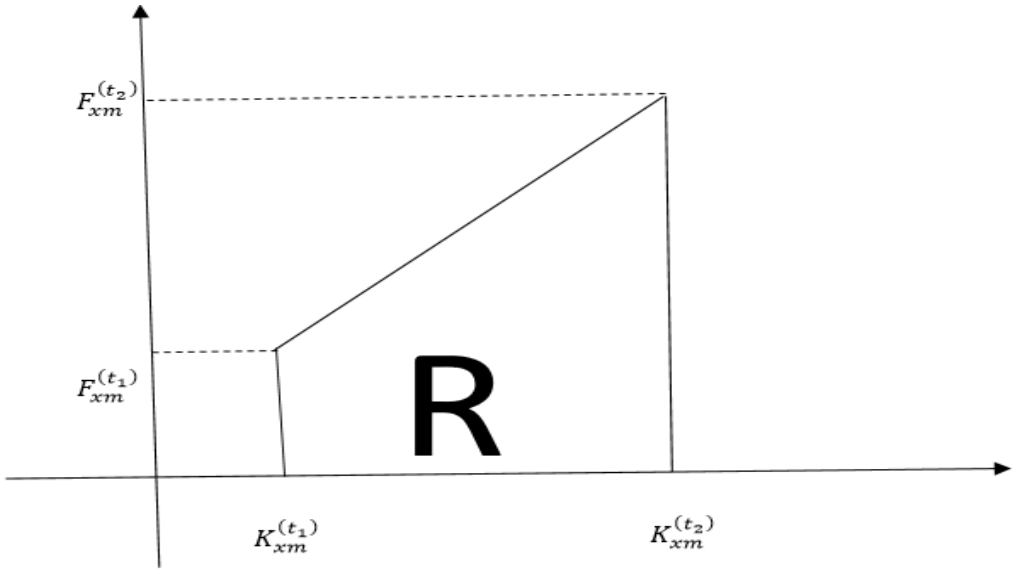
From this equation, it can be deduced that TFR at any time, t, is a function of proportions ever married, never married, as well as levels of ever marital fertility rate and never married fertility rate. Therefore, slight changes in any of F_{xm}, F_{xn}, K_{xm} and K_{xn} will cause a change in TFR and a change in TFR between two survey years would most likely be affected by any of these components of change. Hence, a change in total fertility rate (ΔTFR) is a function of a change in either the proportions of the marriage structure and/or changes in marital fertility and changes in never married fertility. These components of change are independent of each other. An increase in marriage age will most likely distort the proportions never married and ever married groups, but this does not necessarily imply a decline in marital fertility or never married fertility. It is possible, for women who may have delayed their first marriages to give birth in quick succession in order to recover the lost reproductive time.

Similarly, among the never married, childbearing before marriage could also be occurring. To this end, the change in the total fertility rate from the inter survey period t_1 to t_2, denoted as ΔTFR, is broken down into four components as;

- change in proportion ever married (a)
- change in proportion never married position (b)
- change in marital fertility rate (c)
- change in never married fertility rate (d)

Change in TFR is a change in any of the components (a-d) above represented by equation $2\Delta TFR = 5\sum_x \frac{1}{2}\left(F_{xm}^{(t_1)} + F_{xm}^{(t_2)}\right)\left(K_{xm}^{(t_2)} - K_{xm}^{(t_1)}\right) + 5\sum_x \frac{1}{2}\left(F_{xn}^{(t_1)} + F_{xn}^{(t_2)}\right)\left(K_{xn}^{(t_2)} - K_{xn}^{(t_1)}\right) + 5\sum_x \frac{1}{2}\left(K_{xm}^{(t_1)} + K_{xm}^{(t_2)}\right)\left(F_{xm}^{(t_2)} - F_{xm}^{(t_1)}\right) + 5\sum_x \frac{1}{2}\left(K_{xn}^{(t_1)} + K_{xn}^{(t_2)}\right)\left(F_{xn}^{(t_2)} - F_{xn}^{(t_1)}\right)$…… (2)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 1 plots the changes due to proportion ever married. In this case we consider the change due to the proportion ever married.

Figure 1: Changes in TFR due to changes in the proportion of ever married women



As shown in Figure 1 $K_{xm}^{(t_1)}$ 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 periodt_2. The shape is a trapezium hence, applying the area of trapezium to find the area of region R and multiplying by 5 is given as:

$$= 5 \sum_x \frac{1}{2}\left(F_{xm}^{(t_1)} + F_{xm}^{(t_2)}\right) * \left(K_{xm}^{(t_2)} - K_{xm}^{(t_1)}\right) \quad \text{..... (2a)}$$

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 for change due to the age composition of never married women

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

changes in marital fertility rate from period t_1 to t_2 will be:

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

and changes due to never marital fertility rate as;

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

Combining all the changes gives the overall change in total fertility rate (ΔTFR) from period t_1 - t_2 as shown by equation 2;

From ..... (equation1)

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

Then, the change in the total fertility rate from the inter survey period t_1 to t_2, denoted as ΔTFR, substituting equations 2a-2d into equation1

Hence,

$$\Delta TFR = 5\sum_x \tfrac{1}{2}\left(F_{xm}^{(t_2)} + F_{xm}^{(t1)}\right)\left(k_{xm}^{(t_2)} - k_{xm}^{(t1)}\right) \quad \text{.....} \quad [2a]$$

$$+5\sum_x \tfrac{1}{2}\left(F_{xn}^{(t_2)} + F_{xn}^{(t1)}\right)\left(k_{xn}^{(t_2)} - k_{xn}^{(t1)}\right) \quad \text{.....} \quad [2b]$$

$$+5\sum_x \tfrac{1}{2}\left(k_{xm}^{(t_2)} + k_{xm}^{(t1)}\right)\left(F_{xm}^{(t_2)} - F_{xm}^{(t1)}\right) \quad \ldots\ldots\ldots\ldots\ldots \quad [2c]$$

$$+5\sum_x \tfrac{1}{2}\left(k_{xn}^{(t_2)} + k_{xn}^{(t1)}\right)\left(F_{xn}^{(t_2)} - F_{xn}^{(t1)}\right) \quad \ldots\ldots\ldots\ldots \quad [2d]$$

The first component of change [2a-b] is expected to capture the structural or compositional component of the change resulting from the changing age structure of the ever/ never married, whilst [2c] and [2d] may be called the direct components of change from the marital and never marital fertility (Vaupel and Romo, 2002). Then to track the changes, decomposition was further performed for each of the five inter survey year periods.

The data cleaning, preparation and basic analysis was performed 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) and finally Microsoft excel was used to generate the needed computations and charts.

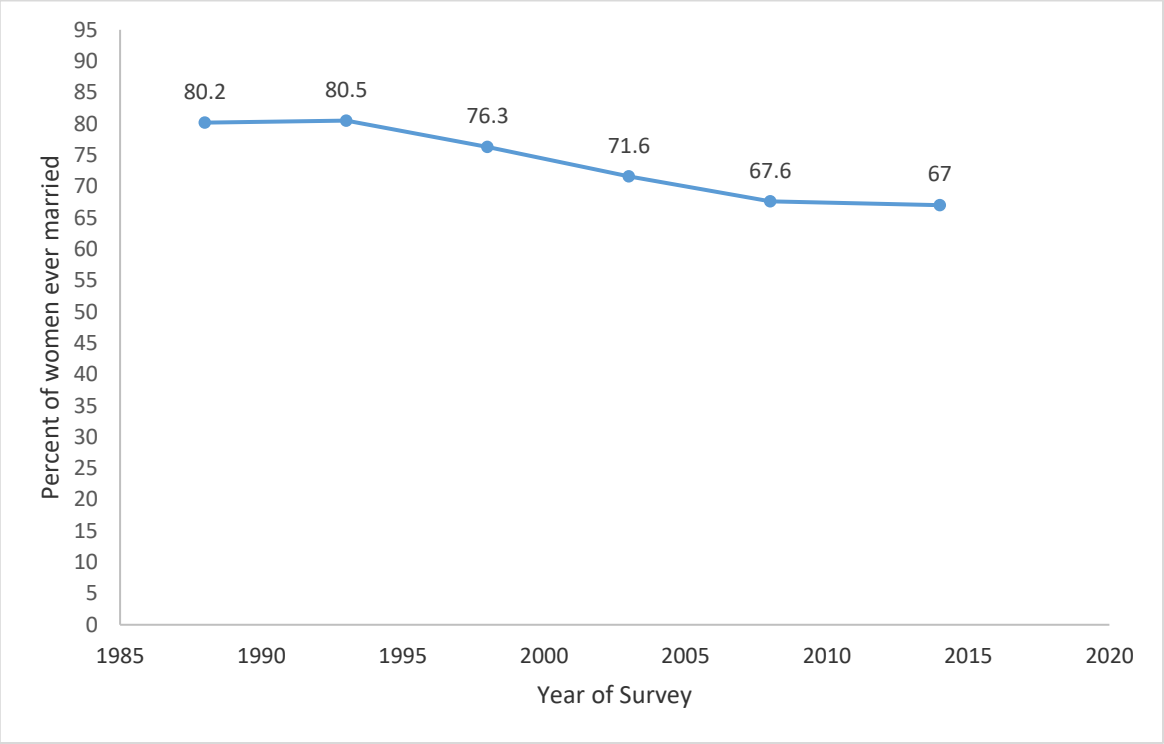
Results

Marriage prevalence trends and patterns in Ghana

Figure 2 shows the prevalence of marriage, and trends among ever-married women over the thirty years study period, 1984-2014. The chart shows that the proportion of ever married women across all age groups increased marginally between 1985 and 1993 and thereafter steadily declined by 12.9 percentage points from 80.5% in 1993

to 67.6.0% in 2008. The decline has since stabilised at 67% over the last decade. 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.

Figure 2: Percentage of ever married women in their reproductive ages, 1984-2014



Source:

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

Universal age at marriage is the age at which all women are married in a population. Table 1 therefore illustrates the age-specific proportions of the ever married.

Table 1 Percent age-specific distribution of ever married women, 1988-2014

Age group	**1988**	**1993**	**1998**	**2003**	**2008**	**2014**
15-19	24.3	22.4	16.4	13.6	9.4	7.3
20-24	77.4	75.3	71	57.9	51.3	42.1
25-29	95.5	94.1	88.8	85.6	79.6	72.9
30-34	98.8	98.7	97.7	94.9	94.3	90.1
35-39	99.5	99.7	99	97.8	96.7	95.4
40-44	99.8	100	99.8	99.4	98.3	98.6
45-49	100	100	98.6	99.5	99.6	99.1

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

The results indicate that from 1988 to 1993, almost all the women irrespective of their age 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. 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, Clark and Nandi, 2017).

Table 2 shows the proportions of never married women 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 2 Percent age specific distribution of never married women, 1988-2014

Age group	**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

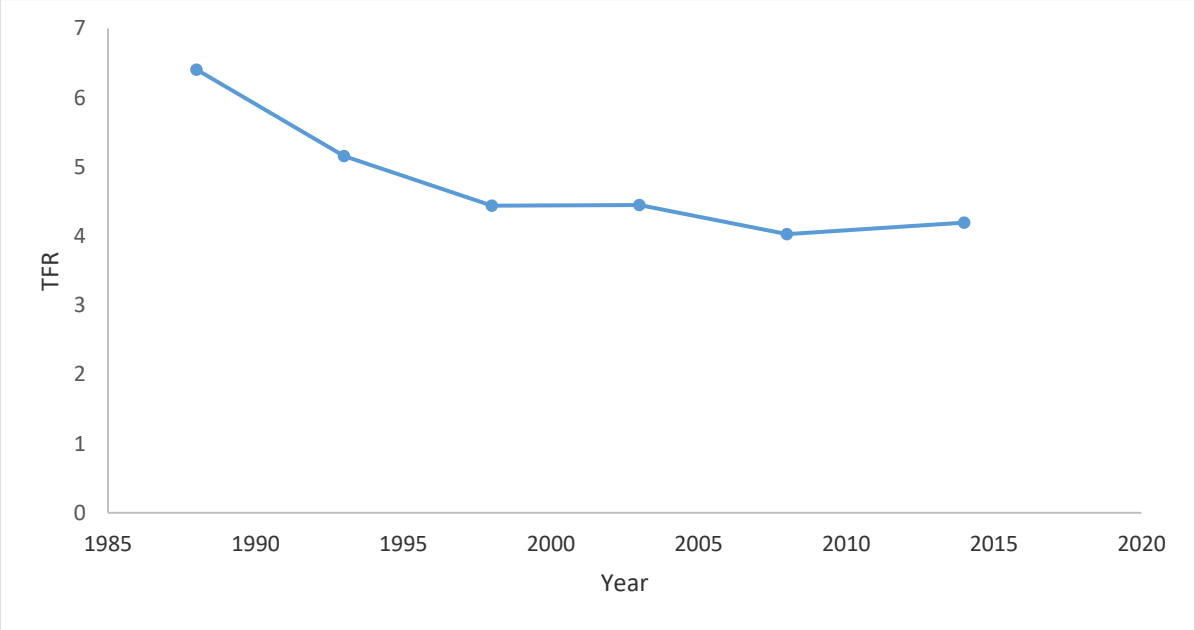
Source: Computed from GDHS 1988, 1993, 1998, 2003, 2008 and 2014

More than 8 in 10 women aged 15-19 years were never married in the late 1990s and early 2000 increasing steadily to reaching almost a universal rate in 2014. The Table also shows a sharp contrast in the marriage patterns among women in their 20s and

those aged 30-49 years. By age 30 years almost all women are married or have been ever married in Ghana. The proportion of women aged 25-29 who were never married increased six-fold over the 30-year period 1984 -2014. Similarly, the proportion of women aged 20-24 never married grew more than 2.56 times over the same period. The sharp increases in the proportions of never married women observed among the various age groups over the thirty -year period is an indication that more women of reproductive ages are postponing marriage in Ghana.

The TFR for the three years preceding each survey date over the thirty-year period is presented in Figure 3. The chart shows a continuous decline from 1988to 2008 and thereafter, a slight increase in 2014. The decline was most rapid from 1985 to 1998 when a decline of 2.0 children (6.4 to 4.6) was observed within the first 15 years and, thereafter, stalled around four children per a women in Ghana.

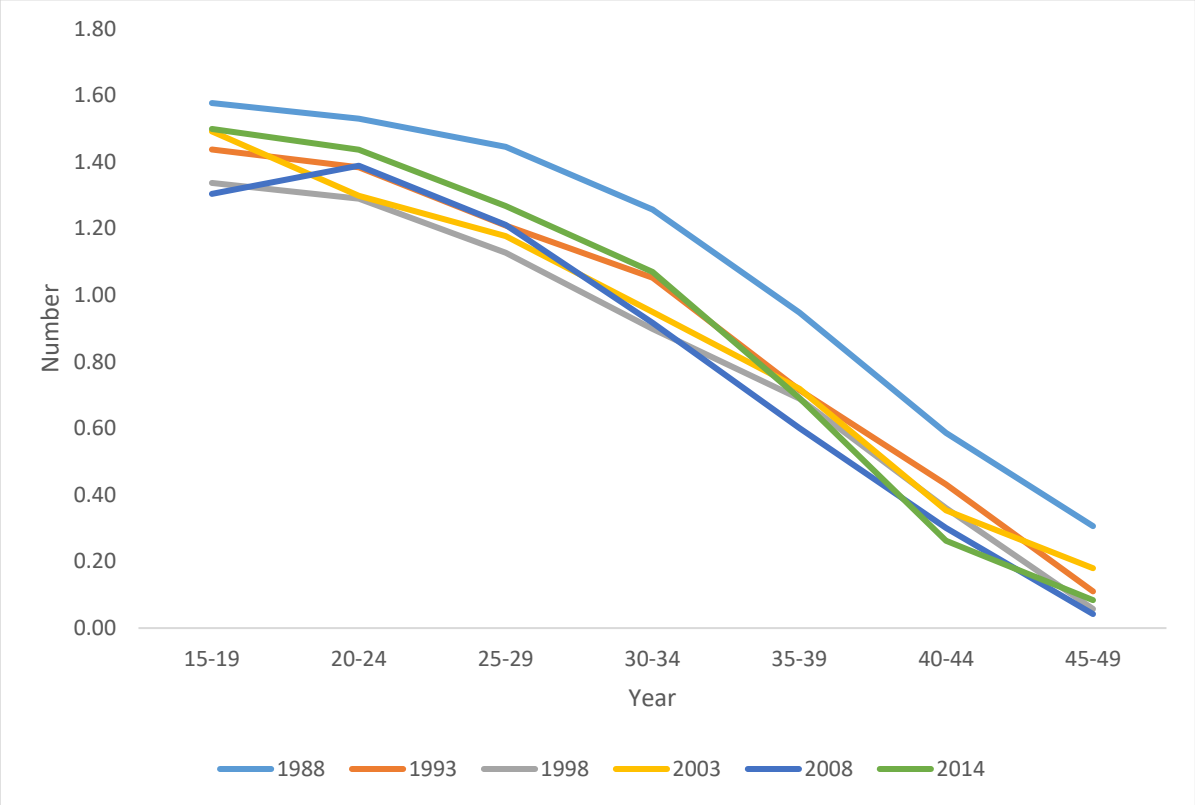
Figure 3 Trends in total fertility rate, 1988-2014



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

Figure 4 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 years.

Figure 4 Age specific marital fertility rate 1988-2014



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

The trends in age specific never marital fertility rates (ASNFR) are shown in Table 3. 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. A decline in ASNFR occurred across age groups younger than 30 years. 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. The year 1998 looks exceptional due to an unusually high ASNFR within 40-44 years. It is also observed that the ASNFR among adolescents has been increasing in the recent past. (Table 3) and this needs further investigation. Traditionally, childbearing is often linked to marriage (Tawiah, 1984; Awusabo-Asare, 1988; Takyi and Addai, 2002), but the increasing total never marital fertility rates could suggest that childbearing before marriage is becoming common in Ghana.

Table 3 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

Components of the changes in the TFR due to proportions married and fertility in 1988-2014

Table 4 presents the results of the decomposition of the changes in total fertility between 1988 and 2014.

Table 4. 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

Changes in the marital structure, as shown by the changes in the age specific proportions of ever married women, contributed about 1.24 of the general decline. 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 4 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. The results show 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 (see Table 4). 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 were highest 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 and 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.

Components of the changes in the TFR due to marital structure and fertility in 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 the period of the fertility stalls. The results are presented in Table 5.

Table 5 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 5 Decomposition of the changes in Total Fertility Rate in Ghana from 1988-1998, 1998-2008, 2008 and 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, 1993, 1998, 2003, 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.

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 16.1 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.

Discussions

From the results, the role of the proportion never married women 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 of never married women. 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 0.4 (200 percent) of this increase was contributed by the ever married fertility rate (Table 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 and 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).

Previous studies in some other countries have all attributed the most significant changes in the overall TFR to marital fertility than to changes in proportions ever married (Abbasi-Shavazi, 2000; Lindstrom and Woubalem, 2003; Gubhaju, Jongstra and Raikoti, 2014). 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 insights 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 study. 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 of 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 1994 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 four births for the past two decades. Considering the trends in delayed marriage, indications are that the proportion of never married women is 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 fertility 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 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 polices 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 married 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.

Conclusion

Overall, this 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. Results from the decomposition analysis have shown that postponement of marriage will not result in sustained fertility decline if it is not accompanied by sustained use of effective birth control measures among women who are not married. Changes in the marital structure alone are, therefore, not enough to achieve desired fertility declines in Ghana. This is because of the potential role of the never-married women in stalling the fertility decline in the country as they continue to engage in childbearing prior to being married. 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.

Considering that the proportion of never married women is steadily rising and never marital fertility has been on increase since 2003, it is important to focus more attention on addressing the sexual and reproductive health needs of the never married women, many of whom are unable to access effective reproductive health information and

services due to some socio-cultural barriers that inhibit their desire to practise contraception especially the adolescents among them.

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.

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.

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