Trends and determinants of female age at first marriage in Sub-Saharan Africa (1990-2014): What has changed?

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Abstract

The study analysed trends and determinants of female age at first marriage in Ghana, Kenya and Zambia using DHS datasets across defined survey horizons: 1990-1999, 2000-1999 and 2010-2014. The data analysis employed frequency distribution, cross tabulation and Cox proportional regression techniques. The results revealed female median age at first marriage as 17. The result showed a reduction in the proportion marrying at age ≤17 between 1990 and 2014 by 9.8% (Ghana), 6.2% (Kenya) and 7.2% (Zambia). Women with tertiary education and rich households had lower hazard ratio to marry at age ≤17 compared with those without education and from poor households (HR: 0.39, CI: 0.0.36-0.43) and (HR: 0.86, CI: 0.81-0.90) respectively. The study supports the use of child-marriage market model to heighten female age at first marriage through access to tertiary education. The boost in female education could be harnessed for sustainable development through provisions of job opportunities.

Keywords: Female age at first marriage, child-marriage market, sub-Saharan Africa

Introduction

Age at first marriage is a crucial population dynamic in Africa that is associated with age at which marriageable individuals of opposite sexes are connected, it is the age at which family is formed, and age at which children are expected to be born in sub-Saharan Africa. Also, age at first marriage is a license for exposure to sexual relationship and indirect vulnerability to its social and health trajectories such as HIV/AIDS, STIs, parenthood (motherhood/fatherhood) and so on (Bongaarts, 2007; Garenne, 2004; Garenne, Leclerc, & Matthews, 2011; Gupta, 2011; Mensch, Grant, & Blanc, 2006; Mensch, Singh, & Casterline, 2005). However, female age at first marriage differs from culture to culture, from one region to region, it varies among groups and from wealth/prosperity to poverty or recession time (Bongaarts, 2007; Glick & Landau, 1950; Indongo & Pazvakawamba, 2015; Odimegwu, Bamiwuye, & Adedini, 2015). The fluidity of female age at first marriage as well as its association with every facet of life, economic and development makes continuous analysis of female age at first marriage inexhaustible in research.

In the world today, female age at first marriage is more diverse and has created two polarities among countries. At one end of the spectrum are countries with late marriages, small family sizes and women's participation in labour force, e.g. China, Hong Kong, Japan, Taiwan, Thailand and South Korea, in addition to most countries of America and Europe (Jones, 2012; Keller, 1973; Murray, King, & Crowe, 2016). At the other extreme, are countries with, not only early marriages, but also girl-child marriages, large family sizes and unequal gender inequalities with countries like Nigeria, Democratic Republic of Congo, Tanzania, Uganda, Niger, Afghanistan, Burkina Faso as examples (Isiugo-Abanihe, 1995; UNICEF, 2014a; World Health Organization, UNAIDS, & UNICEF, 2011; Zwang, 2004). Countries in the latter group are overwhelmed with youth/young persons, and the children share more than one-third proportion of the population (United Nations, 2014; You, Hug, & Anthony, 2015). An average of 41,000 girls are married off every day (UNICEF, 2014b), and in the next decade over 140 million girls are likely to be married before they become 18 (UNICEF, 2014b). Till date, female early marriage is traditionally acceptable and predominant in certain communities while late marriages are increasingly emerging in others (Indongo & Pazvakawamba, 2015; Zwang, 2004).

Marriage is sacrosanct in African settings, it follows cultural process, but mostly characterised by early age, polygamy practices and multiple births (Awusabo-Asare & Annim, 2008; Bingenheimer, 2010; Delius & Glaser, 2004; Ikpe, 2004; Reda & Lindstrom, 2014). However, by description and in accordance to Article 1 of the convention of the right of the child, female early marriage refers to any marriage (formal marriages and informal unions) carried out below the age of 18 or involving a girl

younger than 18 years that lives with a partner as if married (UNICEF, 2005). A girl-child marriage is therefore conceptualised as any formal or informal marriage/union in which a girl younger than 18 years lives with a partner, whether with or without formal registration, under civil, religious or customary laws (Alcalá & Leidl, 2006; UNICEF, 2005). Studies have confirmed that in Africa settings, this type of marriage is predominant (Mensch et al., 2006, 2005; Pettifor, Van Der Straten, Dunbar, Shiboski, & Padian, 2004; UNICEF, 2001). Specifically, in the traditional Africa settings, the girl-child virginity is extolled as virtue that procures honour and good name to the family, hence, the drive to give away a little-child for marriage before her real exposure to pre-marital sexual activities (Mensch et al., 2006; UNICEF, 2001). More than one-quarter of 75 million women aged 20-24 that enters their first marriages or union before they reach 18years of age are from Africa (World Vision, Henderson, & Jones, 2016). Over three out of five sub-regions of Africa were reported to have higher rates of child-marriage than the global average of 26% (United Nations Children's Fund [UNICEF], 2015). The proportion of child-marriage stands at 42%, 40%, 37%, 26% in Western, Central, Eastern and Southern Africa, respectively (United Nations Children's Fund [UNICEF], 2015).

There have been renewed interventions across the globe to address the issue of early marriage, especially the girl-child marriage with a keen focus on sub-Saharan Africa among other developing countries. Prominent among these interventions is the elimination of child, early and forced marriage as enshrined in the United Nations Human Rights Council and the sustainable development Goals (SDGs) (African Union, 2015a, 2015b, UNICEF, 2011, 2014b). There are also numerous international and national organisations that are creating awareness on the dangers inherent in early child-marriage and early motherhood. Specifically, there are focuses on women empowerment (that include free basic education for girls) and sexual reproductive rights which are geared towards lowering the rates of child brides (Adebowale & Palamuleni, 2014; United Nations Population Fund [UNFPA], 2004). These interventions and agendas could also be regarded as offshoots of International Conference on Population and Development (1994), the Beijing conference of 1995, the MDGs (2000), SDGs (2015), Vision-2020 (International Planned Parenthood Federation) and the African Union 'Agenda 2063' and they are all supportive of girl's maturity before exposure to sex, marriage and childbearing (International Center for Research on Women [ICRW], 2015; Mensch et al., 2006, 2005; UNFPA, 2013; Wahhaj, 2015; Walker et al., 2013). Today, there are also emerging laws and regulations against human-trafficking and application of criminal laws to under-age sex, child-bride and sex work (Chersich et al., 2013).

Currently, in the developing countries, more than one-third of girls are married before the age of 18, and one out of every nine girl-child marry before the age of 15 (International Center for Research on Women [ICRW], 2015; Mensch et al., 2006, 2005; United Nations Population Fund [UNFPA], 2012; Wahhaj, 2015). Precisely in Africa, more than 42% of women aged 15-24 had married before reaching the age of 18 (UNFPA 2005; UNICEF, 2014). Despite the global decline in early marriage rate that has been achieved with considerable contributions from the developed countries, and notwithstanding the numerous initiatives to achieve the same reduction in developing countries (Jones, 2012; Keller, 1973; Lloyd and Mensch, 2008), sub-Saharan Africa still remain the largest contributor to under-age marriages world-wide (Budlender, Chobokoane, & Simelane, 2004; Gurmu, & Etana, 2014; Gyepi-Garbrah, Nichols, & Kpedekpo, 1985; International Center for Research on Women [ICRW], 2015). For example, in Nigeria, 49% of women aged 25-49 years were married by age 18 while 61% were married by age 20 (Bigombe & Khadiagala, 2003; Machiyama, 2011; National Population Commission (NPC) [Nigeria] & ICF International, 2013; Population Reference Bureau [PRB], 2015). The median age at first marriage increased in Ethiopia from 17 to 18 years between 2005 and 2011 (Reda & Lindstrom, 2014). In a study conducted by Garenne (2004) using DHS and Women Fertility Survey data across 32 Africa countries, the median age at first marriage increased from 17.7 in 1925/1929 to 18.7 in 1975/1979, representing an increase of approximately 5% in five decades (Garenne, 2004; Measure DHS, 2008). The reported median age at first marriage for Ghana was 18.7 (1993) and 21.0 (2003/2008), Kenya was 18.3 (1993) and 20.2 in 2009, while Namibia recorded 24.8 years in 1992 (Garenne, 2004; Measure DHS, 2008; United Nations, Department of Economic and Social Affairs, Population Division, 2014).

Theoretical framework

The study is premised on the theoretical model of the child-marriage market that explains how the practice of child-marriage could be discontinued (Wahhaj, 2015; Goody, 1990; Mogghadam, 2004; Amin & Bhajraha..2011). The model positions that the practice of child-marriage could be sustained in the presence of inherent preferences for young brides, where younger girls are perceived as good quality and suitability for marriage (Wahhaj, 2015). The model, as applied in other studies, indicated that

in any environment, where the younger the girl-child, the more opportunity the family has to claim purity and receive higher bride price (Bhat & Halli, 1999; Moghadam, 2004; Rezai-Rashti & Moghadam, 2011; Wahhaj, 2015), the higher will be the prevalence of child-bride. Thus, aiming at the interventions which could increase the opportunity cost of early marriage would be potentially suitable for reduction in girl-child marriage (Wahhaj, 2015). The model in its simplicity form, indicated that, the various opportunities provided for girls other than marriage would impact on the marriage market in two ways: (1) it will provide opportunity for the family to negotiate higher bride price (having expended resources on their daughters, especially in terms of money spent on her education) and thereby making it more expensive and less attractive for men seeking young brides; (2) it will provide opportunity for the girl-child to turn down the marriage offer as a result of her engagement in schooling or skills acquisition (Wahhaj, 2015). In addition, since all initiatives from international organisations, and NGOs (national and externally) are tailored towards investments on interventions that could raise awareness about the negative effects of girl-child marriage, the programmes could encourage parents to postpone marriage for their children (Wahhaj, 2015). The programmes could also expose the girl-child to development opportunities such as acquisition of new skills, equipping them with knowledge and understanding of their rights, and the dangers inherent in early motherhood (Wahhaj, 2015). The above notwithstanding, even if these interventions failed to discourage parents in child-marriage, the fact that the expansion of non-marriage related opportunities for girls could enhance the girls enlightenment to turn down marriage offers or negotiate higher bride price will discourage prospective grooms or enhance more waiting time and be a sufficient opportunity to heighten age at first marriage.

At the societal levels, the model could also be linked to various propositions in other studies that have identified increasing age at first marriage with potential to shorten the length of exposure to childbearing, capable of engendering smaller family sizes; and at the macro level, reduce the population sizes (Bongaarts, 1983; Hindin & Fatusi, 2009; Huq & Cleland, 1990; Isiugo-Abanihe et al., 2012; Islam & Islam, 1993; Mensch et al., 2005). In countries where substantial proportions marry early, such countries have tendency for high birth rates, and larger family sizes. However, where marriage is delayed, the time of exposure to pregnancy reduces, fertility could be limited and family size becomes smaller, more time could be gained for productive economic activities. Also, it could also reduce the degree of girl-child's vulnerability to STIs/HIV and AIDS. While several studies have documented the social and economic implications of age at first marriage (Andreev, Kantorová, & Bongaarts, 2013; Bongaarts, 2010; Bongaarts & Sinding, 2011; Okogu, 2011; Psaki, 2015; Zwang, 2004), marriage and religiousity (Odimegwu, 2005); analytical work on the regional variations in age patterns of marriage and complexity surrounding its determinants are relatively scanty in the literature. The study therefore conducted an analysis of female age at first marriage in Ghana, Kenya and Zambia to underscore its trends and changes in its determinants covering the DHS datasets between 1990 and 2014. The idea behind this study is to assess the changes in the determinants of female age at first marriage in sub-Saharan Africa. The results could enhance making appropriate suggestions towards the delivery of post-2015 sustainable development agenda especially through the reduction in early/child-marriage and its associate trajectories such as infant/maternal morbidities and mortality and, girl-child vulnerability to STIs/HIV and AIDS (African Union, 2015a; ICSU & ISSC, 2015).

Data sources and methods

Research design

The data for this study were from national representative datasets of Demographic Health Survey (DHS). The period of 1990 to 2014 was chosen to cover the beginning of uniform DHS dataset (1990s) across sub-Saharan Africa and the latest round of the survey. The surveys were group into 3-Waves: Wave 1 covering surveys within 1990 and 1999; Wave 2 covered 2000-2009 and data for 2010 to 2014 were used in Waves 3. Only the women recode-datasets were used and the respondents were women in their reproductive age (15-49 years). The selection of the countries was guided by availability of at least three datasets that fall within the waves defined for this study. However, among the group of countries whose survey years fall into these waves, three countries were selected randomly across sub-Saharan African with each one representing the Eastern, Western, Southern parts of the region. Thus, Ghana (Western), Kenya (Eastern) and Zambia (Southern) were selected. Also, attempt was also made to minimize bias by placing attention on the selection of dataset from close survey horizons across the countries. That is, within one horizon/wave, the data years are not too wide apart. This is to ensure that the data years are relatively close to avoid obvious variations within each wave. Specifically for Ghana data, 1998, 2008 and 2014 datasets were selected. Kenya's datasets included 1998, 2009 and 2014 while Zambia sets of data

covered 1996, 2007 and 2014. The total sample covered was 98,137 women.

Data measurements and analysis

The period of data collection guided the data grouping and analysis. Data belonging to 1990-1999 was recoded as wave 1, dataset between 2000 and 2009 as wave 2, while the last surveys between 2010 and 2014 were grouped as wave 3. All the datasets were merged together to create a general data file. From this general file, a new data file (containing wave 1, wave 2 and wave 3 data) but with only variables of interest was created as the data file for this study.

Three levels of analysis were adopted, namely: univariate, bivariate and multivariate.The profile of the respondents and other details about the selected variables were presented using frequency tabulations, with basic averages like median computed (where applicable). The analyses were done by splitting according to the waves, and by countries which helped to reveal the trends and the changes among the selected variables. In the multivariate analysis, Cox proportional hazard regression analysis was employed. The Cox hazard regression model permits the time to event analysis of female age at first marriage. The rates of entry into union were estimated using the Kaplan-Meier method while the Log-rank test was used to compare age at entry into first union/marriage between three waves. Ever married was the outcome of interest while 'never married' were censored at their current age at the time of the survey. The net effect of each of the explanatory variables was estimated using hazard ratio with 95% confidence interval having taken the 5% as putative marginal errors effect. The explanatory variables were educational attainment, religious affiliation, wealth status, occupation and usual place of residence. Bivariate analysis was also computed to underscore the distribution of selected respondent's characteristics by age at first cohabitation. The age at first cohabitation was presumed as the age of first union or actual marriage. The variable was recoded into (1) age ≤17 years and (2) 18 years and above.

In this study, the Cox hazard regression employed considered how the hazard of experiencing early marriage (≤17) among respondents with certain characteristics is different from the hazard of experiencing female early marriage in the reference category. In the interpretation of the results, a hazard ratio of 0.4, (for example), means the group concern has a 60% lower hazard than the reference category (Lehrer, 2008; Pettifor et al., 2004). This has also been interpreted and used in different studies (Gurmu & Etana, 2014; Lehrer, 2008; Mubiru, Atuhaire, Lubaale, & Wamala, 2016; Pettifor et al., 2004). Also, a hazard ratio of 1.4 would imply that the group has 40% higher hazard than the reference category. The statistical software used for modeling is Stata/SE version 14. In the Cox proportional hazards regression analysis, both the marital status and the age at marriage were combined to generate the probability of marrying at a particular time, which is the outcome variable. This is termed the hazard. The general hazard model equation is denoted as:

$$Log\frac{H(t)}{H_0(t)} = \beta_1 X_1 + \beta_2 X_2 + \cdots + \beta_n X_n \ldots\ldots\ldots (1)$$

Where X's are the explanatory variables, $H_0(t)$ is the baseline hazard at 'time_t', representing the hazard for a person with the value '0' for all the explanatory variables. The H(t)/H0(t) is regarded as the hazard ratio while the coefficients (βs) are estimated by Cox regression.

Ethical consideration

The data used in this study were secondary data collated by MEASURES DHS, ICF Macro, Calverton, Maryland, USA. The data were made available with the respondents identifiers completely removed. The survey exercise and the data were approved by Institutional Review Board of ICF Macro, and also by country-specific ethics-related committees. International standards of data collections were duly employed and all participants gave informed consent before their participation. Information collected was also accorded the right confidentiality. For this study, the author registered and applied for the use of the data and adequate permission was given before the data were downloaded and analysed.

Results

The profiles of women covered in the study as obtained in the univariate analysis are indicated in Table 1. The total samples of 98,137 women covered were distributed into waves by the year of data collection. Although, the sample distribution among all countries selected was not uniform, so also was the distribution within each wave. However, analysis was done by proportion for uniformity and data consistency. The Kaplan-Meier female median age at first marriage was 17 year; the survival time revealed that 25% of the sample married at age ≤17 year while 75% had married at 23 years. The age distributions show a downward decline from the higher proportion at the younger ages to lower proportion at the older ages. The younger women in the age group 15-24 constituted more than one-third of the sample. From Ghana data, the percentage of women in ages ≤24 years rose from 36.7% in the base-year, to 38.8% in 2000/2009 and decreased to 35.4% in 2010/2014 (Table1). The distribution of women sampled in Kenya exhibited a gradual

diminishing trend across the age categories from 15-19 up to age 45-49.

The proportion of individuals without formal education decreased considerably in Ghana from 35.5% in 1998 to 25.3% in 2008 and 24.3% in 2014. In Kenya, the number increased by 1.9% between 1998 and 2008 but later decreased to 13.5% in 2010/2014. While women with secondary education in Ghana was the highest among other education groups, the proportion also increased across the years surveyed (1990-2014). Primary education for women witnessed consistent decline in Kenya 59.9% (1990s) to 52.2% during in 2000/2009 and decreased again by 2.0% in 2010/2014. Educational attainment increased from primary to secondary education for countries like Kenya and Zambia but declined considerably at the tertiary level. Overall, the percentage of women with secondary education and above was relatively small across all the three countries. The percentage of women without formal education in Ghana doubled that of other countries.

The proportion of women not working was about a third of total women interviewed in Ghana. This proportion only decreased in 2008 by almost 10% when compared with 1998 results. It further declined by 15% in the year 2014. A great variation exists between this result and that of Kenya and Zambia, where more than 60% of the women interviewed were not working (i.e. they were either full-time housewives or unemployed) as at the time of the survey. The professional, the skilled and unskilled manual workers were relatively less than 6% of the women in each survey and across the selected countries. In the first wave (1990-1999), the occupations that had the highest proportion of women in Ghana were farming (39.2%) and the clerical/sales jobs (22.3%). In Kenya, the highest ranked job in 1998 was clerical jobs (36.6%), which later shifted to farming in 2008 and 2014. Farming has consistently been the major occupation for women in Zambia. One in every five women interviewed in 2014 were engaged in farming business in Ghana, Kenya and Zambia.

Table 1. Demographic profile of women across selected Sub-Saharan Countries

	Wave 1 (1990-1999)			Wave 2 (2000-2009)			Wave 3 (2010-2014)		
Selected Country	Ghana N=4 843	Kenya N=7 881	Zambia N=8 021	Ghana N=4 916	Kenya N=8 444	Zambia N=7 146	Ghana N=9 396	Kenya N=31 079	Zambia N=16 411
Age group									
15-19	18.4	23.5	24.7	21.1	20.9	22.4	18.7	19.6	22.5
20-24	18.3	19.6	22.7	17.7	20.7	19.7	16.7	17.4	18.5
25-29	17.7	17.1	16.0	16.6	16.9	19.2	16.6	19.1	17.0
30-34	13.6	12.4	13.5	12.9	14.0	14.6	14.3	14.3	14.8
35-39	12.9	12.7	9.6	13.0	11.0	10.2	13.4	12.4	12.0
40-44	10.0	8.2	7.1	9.9	8.6	7.5	11.0	9.6	8.9
45-49	9.0	6.6	6.4	8.8	7.9	6.5	9.3	7.6	6.2
Total	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
Residence									
Urban	32.7	18.6	37.4	44	31	44.5	49	37.4	48
Rural	67.3	81.4	62.6	56	69	55.5	51	62.6	52
Total	100	100	100	100	100	100	100	100	100
Educational level									
No education	35.9	12.8	14.6	25.3	14.7	10.4	24.3	13.5	8.3
Primary	16.8	59.9	60.3	20.3	52.2	53.2	18.6	50.2	46.6
Secondary	45.2	25.4	22.8	50.7	24.7	31.4	51.7	27.7	39.9
Higher	2.2	1.9	2.4	3.7	8.5	5.0	5.5	8.6	5.2
Total	100	100	100	100	100	100	100	100	100
Occupation									
Not Working	33.7	60.3	67.0	40.4	54.9	45.8	25.2	42.5	45.9
Prof/Armed Forces	2.7	1.5	1.8	4.6	.7	2.7	4.1	0.6	2.2
Clerical/Sales/Admin	22.3	36.6	2.0	2.9	5.5	7.6	35.2	6.6	20.6
Skilled Manual	2.0	0.4	1.8	5.5	6.8	3.5	11.2	4.7	1.2
Farming	39.2	0.1	26.9	46.3	24.3	26.1	22.9	27.9	26.1
Unskilled Manual	0.1	1.2	0.4	0.2	7.8	14.2	1.4	17.7	4.0
Total	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
Religion									
Christianity	77.7	99.8	99.7	73.9	99.3	98.7	76.3	99.8	99.4

Islam	14.3	-	-	16.9	-	-	18.4	-	-
Traditional	8.0	0.2	0.3	9.2	0.7	1.3	5.3	0.2	0.6
Total	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
Total	100	100	100	100	100	100	100	100	100

Source: Computed from selected DHS datasets of Ghana, Kenya and Zambia (1990-2014)

The cross-tabulation featured only the distribution of socio-demographic variables with respect to cohabitation at age ≤17 years and according to the waves and countries of study. The results of the analysis revealed that, relatively, two-third of the girls that married before they attained age of 18 had below secondary school education. Across all the countries of study, almost 60% of the women who had only primary education married before they reached 18. However, there was a declining trend across the waves, except in Kenya where the proportion of women without education and those that marrying at lower age remained relatively constant (Table 2).

Although the proportion of respondents tilted towards a particular religion (i.e. Christianity), the proportions of girl-child that marry remained relatively unchanged from what was obtainable in 1990/1999 in terms of religion distribution. The cross-tabulation results in terms of occupation revealed mixed results according to individual country and years of the survey. The proportions of unemployed girls that married in Zambia was 68.5% in 1990/1999, it was low as 15.6% (2000/2009) but later increased to 40.7% in 2010/2014. Similar result occurred in Kenya with 63.9%, 51.0% and 71.8% in 1990/1999, 2000/2009 and 2010/2014, respectively. Opposite trend was obtained in Ghana with 18.8%, 51.4% and 21.8% across the waves. The proportion marrying at younger ages that were in farming/manual jobs increased with time in Zambia while other countries presented mixed results.

Almost one-third of respondents aged ≤14 years have experienced sexual intercourse before they attained or married at 17 in Zambia and Kenya across the years surveyed. In Ghana, 12.9%, 13.0% and 14.0% have similar experience in 1990/1999, 2000/2009 and 2010/2014 respectively. Relatively, 50% of girls aged 15-19 years have had sex before marrying at age ≤17. The results revealed declining trends in the proportion of rural dwellers marrying at lower age group (age ≤17) between 1990/1999 and 2010/2014. Most girls in rural areas in Zambia married before the age of 18 in 1990/1999, the proportion that later declined to 66.4% and 63.1% in 2000/2009 and 2010/2014 respectively. Ghana and Kenya distribution by this variable also revealed a declining trend.

The results of the Cox proportional hazards regression analysis used in the multivariate level are presented in Table 3. Each model represents the Cox proportional hazard regression for each of the waves (1990/1999, 2000/2009 and 2010/2014). The hazard models revealed that all education attainment categories are positively related and statistically significant to risk of marrying at early age (≤17 years) in all the models. In the second and third waves, the finding indicated that women with higher level of education, were at lower risk of marrying at early age (≤17 years) and the results were statistically significant at $p<0.005$.

Comparing the women with education, especially those that have tertiary education with those without formal education (i.e. reference category), the result revealed that those with tertiary education have increasing lower risk of marrying at early age (≤17) from (HR: 0.34, CI: 0.30-0.39) in 1990/1999 to (HR = 0.39, CI: 0.36-0.43) in 2000/2009 and (HR: 0.36, CI: 0.34-0.37) in 2010/2014. Therefore, the probability of marrying at early age seems to be decreasing with higher education. Also, women with secondary education have lower risk of marrying at early age compared to women without education. The hazard ratios across the waves for secondary education revealed the following: HR: 0.19, CI: 0.16-0.25, HR: 0.60, CI: 0.57-0.63 and (HR: 0.51, CI: 0.50-0.53 in 1990/1999, 2000/2009 and 2010/2014, respectively. In the 1990/1999 results, while women with primary education are less likely to marry at early age in 1990/1999 (HR: 0.50, CI: 0.42-0.61) compared to women without formal education, they were less likely to marry at early age in 2010/2014 (HR: 0.90, CI: 0.88-0.93) compared to the reference category.

The impact of religious affiliations was relatively the same in both wave 2 and 3. In the 1990s, those with Islamic and traditional religion affiliates have higher risk of marrying at younger age (≤17) compared to women who practice Christianity (i.e. reference category). The hazard ratio indicated (HR: 2.33, 95%CI: 1.23-4.43) and (HR: 1.01, CI: 0.53-2.32). Also, apart from the professionals who were less likely to marry at an early age in the 1990/1999, women in farming and sales/service occupations or live in rural areas have higher risk ratio of marrying at early age in this same period (1990/1999). However, in 2010/2014, women who practice Islamic religion have lower risk of marrying at early age (HR: 0.84, CI: 0.77-0.92) while women who practice Christianity also demonstrated lower risk of marrying at younger age with hazard ratio of (HR: 0.73, CI: 0.69-0.76) in (2010/2014). Similarly, those that

practice traditional religion are also 24% less likely to marry at younger age compared to individual women in the reference category in the last wave (HR: 0.76, CI: 0.64-0.85).

Although wealth index was not captured in the dataset in the first round of surveys used in this study, the results of the last two waves (2000/2009 and 2010/2014) indicated that the hazard risk ratio decreases as the household wealth status improves. Women in the middle household wealth status have lower risk of marrying at younger age (with HR: 0.97 and CI: 0.93-1.02) in 2000/2009 and (HR: 0.94, CI: 0.92-0.97) in 2010/2014, compared to the reference category. Women from rich households demonstrated lower risk ratio of marrying at younger age (HR: 0.86, CI: 0.81-0.90) and (HR: 0.87, CI: 0.84-0.89) in both 2000/2009 and 2010/2014 (respectively) compared to women from the poorer households. The hazard ratio for rural residence was relatively stagnated (at HR = 1.02) in both 1990/1999 and 2000/2009, indicating that, women that live in rural area have high risk ratio (2% more) of marrying at younger age compared to those in the urban centres as indicated by hazard ratio results (HR: 1.02, CI: 0.42-2.46) and (HR: 1.02, CI: 0.97-1.07) for the two early waves. However, it was (HR: 1.08, CI: 1.06-1.11) in 2010/2014. At occupational level, the hazard risk ratios were higher among women in sales/services jobs 74% (HR: 1.74, CI: 1.46-2.11), (HR: 1.12, CI: 0.97-1.29) and (HR: 1.18, CI: 1.13-1.24) in 1990/1999, 2000/2009 and 2010/2014 respectively. The women farmers were 18% (in 1990/1999), 7% (in 2000/2009) and 8% (in 72010/2014) more likely to marry at younger age compared to unemployed (the reference category) as indicated by the hazard ratios for these periods. While all occupational categories were statistically significance at the third wave, none was significant at the second wave.

Table 2. Percentage distribution of girl-child (aged ≤17) marrying and selected variables

Waves	Wave I (1990-1999)			Wave I (2000-2009)			Wave I (2010-2014)		
Countries	Zambia	Ghana	Kenya	Zambia	Ghana	Kenya	Zambia	Ghana	Kenya
Selected variables	327	1614	2345	2774	1397	2311	5738	2307	8453
Education									
No Education	24.5	44.0	25.0	15.7	40.7	28.8	13.9	41.6	25.4
Primary	70.0	19.7	66.1	68.9	27.6	62.3	64.8	24.6	62.7
Secondary	5.5	35.6	8.7	14.6	31.0	8.3	20.7	32.9	11.1
Tertiary	-	0.7	0.1	0.8	0.7	0.7	0.6	0.9	0.9
Religion Affiliation									
Christianity	99.8	68.2	99.9	98.3	67.7	99.7	99.0	70.5	99.6
Islam	-	14.5	-	-	17.5	-	-	21.0	-
Traditional	0.2	17.3	0.1	1.7	14.7	0.3	1.0	8.5	0.4
Occupation									
Not working	68.5	18.8	63.9	15.6	51.4	51.0	40.7	21.8	71.8
Professionals	0.6	1.7	2.1	1.5	1.2	19.5	0.6	2.0	7.4
Clericals/services	21.8	58.3	28.9	69.2	30.3	9.8	28.2	56.5	11.0
Farming/Manuals	9.1	21.2	5.2	13.6	17.1	19.7	30.5	19.7	9.8
Age at 1st sex									
1st union	17.8	27.6	27.3	38.2	24.8	24.5	47.3	47.1	39.1
< 15 years	29.1	12.9	28.6	14.9	13.0	20.6	12.0	14.0	21.7
15-19 years	52.8	57.9	43.0	46.0	59.9	52.9	39.8	37.7	38.4
20 & above	0.3	1.3	1.1	0.9	2.1	2.0	0.9	1.2	0.8
Residence									
Urban	-	27.4	15.4	33.6	30.2	21.1	36.9	36.2	30.9
Rural	100.0	72.6	84.6	66.4	69.8	78.9	63.1	63.8	69.1

Source: Computed from selected DHS datasets of Ghana, Kenya and Zambia (1990-2014)

Table 3: Hazard ratios of female age at first marriage in sub-Saharan Africa (1990-2014)

Variables	Wave 1			Wave 2			Wave 3		
Education	HR	P>|z|	95%CI	HR	P>|z|	95%CI	HR	P>|z|	95%CI
No Education	(RC)								
Primary	0.5024	0.000	0.42-0.61	0.9225	0.001	0.88-0.96	0.9067	0.000	0.88-0.93
Secondary	0.1966	0.000	0.16-0.25	0.6034	0.000	0.57-0.63	0.5134	0.000	0.50-0.53
Tertiary	0.3405	0.000	0.30-0.39	0.3888	0.000	0.36-0.43	0.3599	0.000	0.34-0.37
Religion									
Christianity	(RC)								
Islam	2.3327	0.010	1.23-4.43	0.8396	0.000	0.77-0.92	0.7313	0.000	0.69-0.76
Others	1.0109	0.782	0.53-2.32	0.9571	0.522	0.83-1.09	0.7364	0.000	0.64-0.85
Wealth status									
Poor	(RC)								
Moderate	n/a	n/a	n/a	0.9711	0.230	0.93-1.02	0.9437	0.000	0.92-0.97
Rich	n/a	n/a	n/a	0.8555	0.000	0.81-0.90	0.8667	0.000	0.84-0.89
Occupation									
Unemployed	(RC)								
Sales/Services	1.7389	0.000	1.46-2.11	1.1199	0.113	0.97-1.29	1.1820	0.000	1.13-1.24
Farming	2.1789	0.000	1.85-2.57	1.0688	0.348	0.93-1.23	1.0832	0.000	1.04-1.13
Professional	0.6929	0.714	0.97-4.95	0.9932	0.925	0.86-1.15	1.0559	0.040	1.00-1.11
Residence									
Urban	(RC)								
Rural	1.0227	0.960	0.425-246	1.0186	0.448	0.97-1.07	1.0814	0.000	1.06-1.11

Source: Computed from DHS, 1990-2014. n/a =Data not available; RC= reference category

Discussion

The study provided empirical results from cross-sectional surveys at different points in the 24 years period on the risk of marrying at early age among women in Ghana, Kenya and Zambia. Notwithstanding the existence of country-by-country studies on determinants of age at marriage (Goldstein & Kenney, 2001; Jones, 2012; Zwang, 2004) or studies on the economic implications of late marriage (Andreev, Kantorová, & Bongaarts, 2013; Bongaarts, 2010; Brown, 2007; Cancian & Reed, 2008; Gupta, 2011; Okogu, 2011), a recent single trends analysis of female age at first marriage covering three regions of Africa (western, eastern and southern), for relatively two decades, is not only novel but rare. The relevant of interventions through the child-marriage market as espoused in this study could be crucial insights for reducing the menace of child bribes/marriages in sub-Saharan Africa as a whole. The study could also give the young girls the understanding of the implications of under-age marriage, and the need to resist vulnerability to the risk of early marriage. The study could be regarded as update on several individual and aggregate data sources for 50 years (Garenne, 2004) which may not reveal the reality, especially due to mortality level and the level of instability in several aspects of the economy, politics including data management. In addition, the use of standardised national representative data and the analysis by survey horizons positions this study differently from existing individual country-based studies (Cancian & Reed, 2008; Garenne et al., 2011; Glick & Landau, 1950; Goldstein & Kenney, 2001; Jones, 2012; Psaki, 2015; Zwang, 2004)

The overall results from this study pointed to the fact that women age at first marriage is rising though at a slow pace in Zambia, Ghana and Kenya, and by extension, across sub-Saharan regions. Empirical revelation from the study is that the proportion that marries at early age is decreasing in all countries of study, though not at a uniform rate. Women median age at first marriage increased consistently from 1990/1999 to 2010/2014, however in Zambia (as exceptional case), it reduced in 2000/2009 but thereafter increased in 2010/2014. The decline in the proportion of girl-child experiencing sex at age ≤15 could also reduce the risk of entering into early marriage.

There are elements of religion support for early marriage in the countries of study. The results of analysis where all religion affiliations became statistically significant in the last wave suggested the reality of this support in the current dispensation (2010/2014). Marriage, religion and culture in sub-Saharan Africa are intertwined and higher values are still placed on the girl-child virginity as tools for procuring good honour to the family and higher bride price (Awusabo-Asare & Annim, 2008; Bingenheimer, 2010; Delius & Glaser, 2004; Gurmu, & Etana, 2014; Ikpe, 2004; Odimegwu, 2005; Reda & Lindstrom, 2014). Thus, families could be culturally compelled to give away a little-child for marriage before her real exposure to pre-marital sexual activities in order to receive the perceived honour and high bride price.While other studies have confirmed that formal education plays significant role in early marriage (Berrington, Stone, & Beaujouan, 2015; Indongo & Pazvakawamba, 2015; UNICEF, 2005), the results from this study statistically supported only tertiary education as a crucial determinant for later-age marriages in Ghana, Kenya and Zambia, the result which can also be generalised to cover other sub-Saharan African countries. This finding also contradicted other studies that have recommended compulsory primary (or basic) education as panacea for early marriage (Brown, 2007; International Center for Research on Women [ICRW], 2015; Martin & Juarez, 1995; Potts, Gidi, Campbell, & Zureick, 2011; UNICEF, 2005; Wright, 2007). The study also provided evidence that there is no common age at entry into marriage in sub-Saharan Africa.

The study demonstrated that increase in wealth reduces the propensity to marry early (age ≤19 years). This information is also validated by its statistical significant ($P < 0.005$) and could be a pointer to the need for women empowerment in terms of job creation or opportunities in the countries of study to raise women age at first marriage. This finding is in tandem with the finding from Garenne (2004) and Garenne et al (2011), where income was identified as main factor of increasing median age at marriage (Garenne, 2004; Garenne et al., 2011). Although, the professional occupation distribution could be directly attached to high educational attainment, a distinct support for girls to take professional jobs could also make a significance contribution to the lower hazard risk of entering into early marriage. Individuals certified as professionals must have (in most cases) attained tertiary education, spending years in schooling or training which makes marriage to be voluntarily or inadvertently delayed. The relative high risk of marriage at early age among women in rural areas is an indication that early marriage is still in vogue in the rural communities of the study locations.

Limitations of the study

The omission of wealth index in the first dataset (1991-2000) selected for this study circumvented a long broad overview of odds ratios of women

marrying at a younger age with respect to selected variables in the 90s.

Conclusion and recommendations

The study concludes that women age at first marriage is increasing in sub-Saharan Africa, though at a very slow rate and not in uniform proportion across Ghana, Kenya and Zambia. It highlighted that the relative risk of marrying at younger age reduces as education increases to tertiary level and also as wealth status changes. Leveraging on the theoretical model of the child-marriage market, the study specifically underscored the need to build support towards access to tertiary education, professional jobs which could empower the girl-child to reject or negotiate marriage offers until maturity ages and thereby delay marriage. While these supports raise the opportunity cost of marriage, it will also release the girls for productive economic opportunities. The import of tertiary education cannot be overemphasized in stemming under-age marriage while gainful occupation could double as empowerment tool as well as a means of raising women age at first marriage. The observed irregular pattern of women age at first sex among the under-15 is fundamental to the formulation of policy and policy directions. Overall, the reduction in girl-child marriage have potential to reduce girl-child vulnerability to STIs/HIV and AIDS and possible delivery of post-2015 sustainable development agenda. The study therefore supports the use of child-marriage market model to reduce child marriage but through girl's access to tertiary education and professional occupation empowerment.

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