Journal of Population and Social Studies, Volume 26 Number 1 January 2018: 13 - 31
DOI: 10.25133/JPSSv26n1.002

# Spousal and Household Characteristics Associated with Women's Fertility in Sub-Saharan Africa

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## Abstract

*This paper is based on a study that examined the influence of spousal and household characteristics on fertility of married women in sub-Saharan Africa (SSA). It utilized data from Demographic and Health Survey (DHS) from four countries between 2010 and 2015. Fertility was measured by the number of Children Ever Born (CEB). Descriptive and Poisson regression techniques were used for analysis. Results showed variation in the mean number of CEB across categories of spousal and household characteristics and across the countries. The Poisson regression analysis showed that while spousal age and age at marriage influenced fertility similarly across the countries, spousal educational attainment and household characteristics influenced fertility differently across the countries. The study concludes that, although some disparities exist in the way spousal and household characteristics influence fertility across sub-Saharan Africa, these characteristics cannot be overlooked in driving sustainable fertility transition in the region.*

## Keywords:

*Spousal characteristics; household characteristics; women's fertility; sub-Saharan Africa*

## Introduction

Fertility levels in sub-Saharan Africa remain the highest compared with other developing regions. Although Kenya, Ghana, Zimbabwe and Botswana have experienced considerable decline in fertility (Blacker, Opiyo, Jasseh, Sloggett, & Ssekamatte-Ssebuliba, 2005; Garenne, 2008; Tabutin & Schoumaker, 2004), recent studies have shown that some of the countries are experiencing 'stalls' in recent times (Bongaarts & Casterline, 2013; Cleland, Ndugwa, & Zulu, 2011). Several arguments have been put forward to explain the persistently high level of fertility in sub-Saharan Africa. Most of these arguments revolve around gender and patriarchal family systems in the region. These systems encourage subordination of women and socio-economic inequality between men and women. Mason (2001) argued that these systems have been responsible for the late onset and slow pace of fertility transition in the region. Isiugo-Abanihe (1994) have also

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argued that the patrilineal and male dominant family systems in most countries in the region have also encouraged large families, thereby inhibiting persistent fertility decline.

The countries in sub-Saharan Africa are steeped in cultural practices that empower men, thereby leaving most of the household decision-making, including fertility in their hands (Ezeh & Dodoo, 2001; Makinwa-Adebusoye, 2007). This trend is strengthened by polygynous practices, which encourage men to have children till their old age. It also results in wide age gaps between spouses, as a result of which women may become victims of double subordination (Barbieri, Hertrich, & Grieve, 2005; Bloom, Wypij, & Gupta, 2001; Frost & Dodoo, 2009; Goldman & Pebley, 1989; Ratcliffe, Hill, & Walraven, 2000). Yet, most research on fertility is focused on women, particularly married women, leaving out their spouses and the household environment they come from, even though it is evident that fertility transition in sub-Saharan Africa (SSA) is male driven (Derose, Wu, & Dodoo, 2010). There are few studies relating men's characteristics to fertility in the region (Dodoo & Frost, 2008; Ezeh, 1993). However, attempts to explore the link between the spousal characteristics and fertility have been limited to spousal communication and contraceptive use (Bawah, 2002; Ezeh, 1993; Feyisetan, 2000; Oyediran, 2002; Salway, 1994). Studies have shown that spousal communication improves contraceptive use among couples (Irani, Speizer, & Fotso, 2014; Oyediran, 2002; Tawiah, 1997); and that men desire a larger family size than women (Bankole & Singh, 1998; Isiugo-Abanihe, 1994). Despite the strong influence of spousal education and communication on women's contraceptive use and fertility, the effects of spousal age, age at marriage and other household characteristics on women's fertility in SSA are not clearly known. This study seeks to provide answers to the following questions – (i) do spousal characteristics such as age, age at marriage and education, influence fertility in SSA? What influence do household characteristics have on fertility in SSA?

## Literature Review and Theoretical Perspective

In the traditional African culture men enjoy greater benefit than women by having a large family such as, economic and social benefits as well as old age security (Caldwell & Caldwell, 1987; 1990). Thus, they have many wives who bear as many children as possible, even till their old age. These cultural practices therefore have implication for women's fertility by the main decision maker and the household composition. The old age security model as explained by the Caldwell's theory of upward intergenerational wealth flow is such that wealth flows upward from the younger to the older generation in a traditional society. This is contrary to the downward intergenerational wealth flow in the westernized and developed regions of the world, whereby wealth flow from the parents to the younger ones (Caldwell, 1976; Caldwell & Caldwell, 1987). Recent decade has shown a slight movement away from the traditional kinship family system into a nucleated one where an increased number of women are becoming educated and are more involved in household decision-making such as fertility but despite this, fertility remains high in the region.

The culture of lineage perpetuation strengthened by the male dominance in fertility issues is another barrier to the acceptance and use of family planning (FP) by most men in the region. According to Frost and Dodoo (2009), most African men reject of family planning methods by their spouses due to their fear of losing control over their spouse's reproduction. This may explain the stalls in fertility transition in countries that had earlier experienced significant fertility decline. Most studies on spousal communication and women's contraceptive use found that the decision

to use contraceptives still lie very much with the men than with the women. Studies have shown that men generally desire larger families compared with their wives and which influences the latter. Isiugo-Abanihe (1994) studied the motivation for a large family size among men in Nigeria and found that men preferred a bigger family which subsequently shaped their spouses decisions. Bankole and Singh (1998) in a study of 18 developing countries based on DHS data found that though the desire for large family sizes were reported by most husbands and wives, the husbands' desire for them was stronger. Similarly, Tilahun, Coene, Temmerman, and Degomme (2014) who studied spousal communication and agreement on contraceptive use in Jimma zone, Ethiopia found the husbands' approval of FP was a strong determinant of contraceptive use among couples. Despite the strong spousal influence on women's contraceptive use, it is yet to be ascertained, the impact of spousal characteristics such as age, age at marriage and level of education on women's fertility.

A few studies that investigated the link between household characteristics and contraceptive use have shown women in urban areas were likely to use contraceptives and thus have lower fertility (Whyte et al., 2008). Other studies on the type of marriage and fertility have shown that fertility issues play out differently in monogamous and polygamous marriages. For example, Dodoo (1998) in a comparative study between Ghana and Kenya, found a stronger female fertility influence in polygamous marriages than monogamous marriages, despite women in the latter being more educated. Hayase and Liaw (1997) in a comparative study of 4 SSA countries on factors influencing polygamy found that, the prevalence of polygamy in each of these countries was influenced by their type of education. Hence, they concluded that populations with greater access to western education tended to prefer monogamous marriages where women's level of education influences fertility, while in a more traditional population, polygamy is predominant as women had lower levels of education. Additionally, women from rich households use contraceptives more than those from poorer households (Adebowale, Adedini, Ibisomi, & Palamuleni, 2014). Yihunie Lakew, Tamene, Benedict, and Deribe (2011) in a study of geographical variation in contraceptive use among women in Ethiopia found that wealth status and residence (urban or rural) among other factors, were predictors of women's use of modern contraceptives. Thus, if household characteristics influence contraceptive use among women, it is logical to say that these characteristics are also likely to influence women's actual fertility performance. Hence, with a tilt from traditional to westernization and modernization, particularly the proliferation of monogamous marriages; nuclear family settings as against the usual polygamous and kinship/extended family settings; increased educational attainment by women and their improved involvement in fertility decisions among other critical household decision-making; it is important to examine the influence of spousal and household characteristics, such as age, age at marriage, educational attainment, household wealth status, type of marriage and type of place of residence on fertility levels in the region.

Studies have shown that women's attitude to contraceptive use depend on their husbands' level of education and not on theirs alone (Berhane, 2015; Ezeh, 1993; Mesfin, 2002; Oheneba-Sakyi & Takyi, 1997). Ezeh (1992) examined the attitude of partners in terms of contraceptive use in Ghana and found that husbands' educational attainment influenced their wives' level of contraceptive use, but not otherwise. This is consistent with the findings of another study by DeRose and Ezeh (2005), which showed a strong influence of husbands' education on their wives fertility intention, irrespective of the latter's level of education. Another study conducted among different ethnic groups in Nigeria by Kritz (1999) found despite the importance of women's education in predicting contraceptive use, a positive and consistently significant relationships were found

between husbands' education and women's contraceptive use. It then follows logically that women's actual fertility may not be dependent only on their own or their spouse's education attainment alone, but on spousal characteristics such as age, age at marriage, as well as well as household characteristics.

A number of studies have examined the influence of women's demographic and socio-economic characteristics on fertility behavior in sub-Saharan Africa. Studies relating women's educational attainment or years of schooling with fertility in SSA have shown that an inverse relationship exists between the two (Martin, 1995). Women's education also interacts with other proximate determinants such as age at marriage and age at first birth to influence fertility. Women who stay longer in schools have been found to marry later, thereby postponing the timing of first birth and reduce the number of years of their exposure to the risks of conception (Bongaarts, 2003, 2010). Ikamari (2005) in a study of the influence of education on marriage timing in Kenya found that women who are more educated married later and this further increased their age at first birth. Other studies on education-fertility relationship found that education above the primary level influenced fertility more (Gupta & Mahy, 2003; Kravdal, 2001; Shapiro, 2012) while some found the community level education as an important predictor of fertility in addition to individual woman's education (Benefo, 2006; Kravdal, 2002, 2012; Moursund & Kravdal, 2003). If women's age and age at marriage and their level of education attainment have been found to influence their fertility, it is pertinent to also examine the influence of spousal age, age at marriage and their educational attainment on women's fertility as well. Other studies relating household characteristics to women's contraceptive use, also suggest that a relationship is likely to exist between household characteristics and women's fertility. Hence, there is a need to examine spousal and household characteristics and their influence on the number of Children Ever Born across the four regions of SSA.

## Settings of countries under study and development indicators

The choice of the countries under study is based on their history of high fertility levels with the aim of having a full representation for the four regions in SSA. Available evidence shows that fertility levels have remained high in 3 out of the 4 countries for decades. The inclusion of the fourth country was due to data availability for the period covered by this study and the necessity for a representation from the Southern region of SSA.

Nigeria, otherwise known as the giant of Africa, is the largest country in SSA, situated in the western region of Africa. With an annual growth rate of 2.2%, the population is presently estimated at about 180 million people (based on its 2006 population and housing Census which put the figure at 140 million). The Total Fertility Rate (TFR) from the 2013 DHS is 5.5, which is a slight decline from the 2003 and 2008 figure of 5.7 (see Table 1). About 46% of the Nigerian population consists of children under 15 years of age, with one in five households headed by women. Nigeria is a developing economy with geographical diversity characterized by lowlands and highlands, and an uneven population distribution across six geo-political zones. The population is mostly rural with more males having some level of education compared with the females. This has resulted to women being not empowered with only about 31% of currently married women involved in household decision making; early or child marriages and long period of exposure to childbearing. Despite the widespread knowledge of contraceptive its use remains very low, where 10% and 15% of Nigerian men and women respectively use contraceptives. The current rate of infant and childhood mortality in Nigeria implies that one in every 15 infants and

one in eight children die before their first and fifth birthdays respectively (National Population Commission (NPC) [Nigeria] and ICF International, 2009; 2014).

Located in the central African region, the situation in Democratic Republic of Congo (DRC) is similar to Nigeria. Available evidence shows that TFR in DRC has consistently remained high between 6.0 and 7.0 till date (see Table 1). The United Nations estimates the TFR at 6.7 in 1999, which differs from the national estimate of 7.3 at the same period. Further estimates for the periods between 1980-84 and 1990-95 put the rates at 6.7 for the two periods (Shapiro & Tambashe, 2001). However, the most recent Demographic and Health Survey conducted in 2013/2014 gave a value of 6.6 for the TFR in the DRC, with a variation of 5.5 to 7.3 between urban and rural areas respectively. Although more males are educated than the females, 4 in 5 Congolese women were employed in the 12 months preceding the survey with about 1 in 4 married women reporting that they were not involved in household decision making. Adolescent fertility is about 3 times higher in poorer households and despite the widespread of contraceptive knowledge in the country, only 20% of currently married women use contraceptives. Under-5 mortality decreased from 148 to 104 per thousand children between 2007 and 2014 (Ministère du Plan et Macro International, 2008; Ministère du Plan et Suivi de la Mise en œuvre de la Révolution de la Modernité (MPSMRM), Ministère de la Santé Publique (MSP) and ICF International, 2014)

More than 50% of the Ugandan (in East Africa) population is aged 15 or younger, with about 25% of adolescents aged 15-19 years carrying their first child or pregnant. There was a slight decline in the TFR from 6.9 in 2001 to 6.7 in 2006 and further to 6.2 in 2011. Infant mortality also declined from 88 in 2001 to 54 per thousand live births in 2011. The economy of Uganda is predominantly agricultural, most of the population largely dependent on subsistence farming and light agro-based industries. Educational attainment is generally low in the country as 36% and 28% of men and women have some secondary or higher level of education respectively. Statistics also show that about 2 in 5 women currently married were involved in major household decision making, including their health. Despite knowledge of contraception, less than 30% of currently married women use contraceptives (Uganda Bureau of Statistics (UBOS) and ICF International Inc, 2012).

Zimbabwe is a landlocked southern African nation which lies between Limpopo and Zambezi rivers. Its economy is well diversified but agriculture and mining remain its major sources of foreign exchange. Zimbabwe's level of fertility has witnessed a significant reduction from a TFR of 5.4 in 1988 to 4.0 in 2015. This may be due to knowledge of modern contraceptives and increased contraceptive prevalence rate among currently married women from 59% in 2011 to 67% in 2015. About 77% and 73% of men and women respectively have either attended or completed some secondary or higher education. Almost 70% of currently married women are involved in making decisions about major household issues including their own health. The infant mortality reduced slightly from 60deaths per thousand live births in 2006 to 57 per thousand live births in 2011. On the other hand, child mortality increased slightly from 24 to 29 deaths per thousand live births over the same period (Zimbabwe National Statistics Agency and ICF International, 2012; 2016).

**Table 1:** Fertility trends and patterns in the countries under study

| Country | Survey Year | Total Fertility Rate (TFR) |
|---|---|---|
| Nigeria | 1990 | 6.0 |
| | 1999 | 4.7 |
| | 2003 | 5.7 |
| | 2008 | 5.7 |
| | 2013 | 5.5 |
| Democratic Republic of Congo | 2007 | 6.3 |
| | 2013-14 | 6.6 |
| Uganda | 1988-89 | 7.4 |
| | 1995 | 6.9 |
| | 2000-01 | 6.9 |
| | 2006 | 6.7 |
| | 2011 | 6.2 |
| Zimbabwe | 1988 | 5.4 |
| | 1994 | 4.3 |
| | 1999 | 4.0 |
| | 2005-06 | 3.8 |
| | 2010-11 | 4.1 |
| | 2015 | 4.0 |

*Source: Measure DHS Statscompiler at https://www.statcompiler.com/en/*

# Data and Methods

## Data Source

Data from Demographic and Health Survey (DHS) Demographic and Health Survey (DHS) a project funded by the United States Agency for International Development and implemented by ICF Macro was the basis of this study. The DHS is cross-sectional and nationally representative household sample surveys. The similarities in the method of data collection and the survey designs have also made comparison across countries possible. Couples' data for the SSA countries was also analyzed. These countries were selected because of their high fertility rates and availability of data between 2010 and 2015. Although Zimbabwe has a relatively low fertility rates as indicated by the TFR, it was included in the study as there was readily available data for the time frame considered, as well as the necessity to examine the pattern of influence across the four regions of SSA. The DHS data for Nigeria (2013); DRC (2013/2014); Uganda (2011) and Zimbabwe (2010/2011) were further analyzed. In order to correct for over-sampling and under-sampling, appropriate weights were constructed, which brought the sample size to – 9,021for Nigeria; 4,344 for the DRC; 1,076 for Uganda and 3,132 for Zimbabwe.

## Variable measurements

*The outcome variable:*

The outcome variable for this study is women's fertility measured by the number of Children Ever Born (CEB). The outcome variable was treated as a count variable, which necessitated the use of Poisson regression models at the multivariate level of analysis.

*Explanatory variable:*

The main explanatory variables for this study are spousal and household characteristics, which include spousal age, age at marriage and level of education, household wealth status, place of residence and type of marriage. Other control variables include women's level of education, occupational status and ever use of contraceptives. These were mostly treated as categorical variables. Data analysis was done in three stages, using STATA 12.

The first stage was the frequency distribution of the explanatory variables, women's characteristics and the outcome variable. The second stage involved the use of Analysis of Variance (ANOVA) to examine the differences in the mean number of CEB across different categories of spousal and household characteristics. The third stage examined the relationship between the main explanatory variables, the control variables and the outcome variable using Poisson regression. Three models were fitted for the main explanatory variables and the outcome variable across the countries under study. The first model examined the influence of spousal characteristics on fertility (model 1a); the second model examined the influence of household characteristics on fertility (model 2a); and the third model examined the influence of both spousal and household characteristics on fertility (model 3a). The part 'b' of the models included the control variables (women characteristics) for each of the models.

## Results

The result of the frequency distribution of spousal, household and selected women's characteristics is presented in Table 2 below. Most spouses were aged between 25 and 34 years in DRC, Uganda and Zimbabwe, while it was between 35 and 44 years in Nigeria. In all the countries, most spousal age at marriage was between 20 and 35 years. Across the countries, most spouses had secondary or higher educational attainment, except for Uganda where about 63% of spouses had only primary education. Household characteristics showed that more than 40% of households in three countries were in the poor wealth quintile, except for Zimbabwe where about 43% households fell within the rich wealth quintile. The results also showed that most households were from the rural areas, with monogamous marriage prevalent across the countries.

Almost half of the Nigerian women had no formal education (48.5%); 43% in DRC and 64% in Uganda had primary education; while in Zimbabwe about 65% of the women had secondary/higher education. Most of the women were employed except in Zimbabwe, where about 56% were unemployed. About 43% of the Nigerian women were employed in the sales and services sector, while most from DRC and Uganda were employed in the agricultural sector. About 46% and 65% of women from Nigeria and Zimbabwe respectively have ever had between 1 and 3 children, about 54% and 59% of women from DRC and Uganda respectively have had up to 4 children. Information on ever use of contraceptive among women is quite low in Nigeria (23.2%) and DRC (37.5%) compared with Uganda and Zimbabwe where 56% and 85% reported ever use of contraceptives respectively.

Table 3 presents the result of the bivariate analysis showing the differences in the mean number of Children ever Born (CEB) across the categories of spousal and household characteristics. The table showed that women's mean number of CEB significantly increased with spousal age; decreased significantly with increased age at marriage except in Uganda, where mean number of CEB increased significantly with spousal age at marriage above 35 years. The relationship between spousal level of education and women's mean number of CEB showed a mixed result

across the countries. While mean number of CEB significantly decreased with a rise in spousal level of education in two countries (Uganda and Zimbabwe), reduction in the mean number of CEB was only observed in Nigeria and DRC with spouses having at least primary level of education. Also, a significant reduction in the mean number of CEB was observed with increase in the household wealth status in Nigeria and Zimbabwe, while in the DRC and Uganda the mean is highest in the middle household wealth group compared with the poor and the rich households. A significantly higher mean number of CEB was observed for rural residents while a significantly higher mean number of CEB was observed among women from polygamous households.

Tables 4a and 4b present the result of the Poisson regression which further examines the influence of spousal and household characteristics on the number of CEB by women. Model 1a shows the result of the influence of spousal characteristics on women's fertility in Nigeria. There is a direct and significant increase in the number of CEB as spousal age increases ($p$<0.001). An inverse but significant relationship exists between spousal age at marriage and the number of CEB ($p$<0.001). While a direct relationship exists between fertility and spousal educational attainment at the primary level, a negative relationship exists between fertility and spousal educational attainment above the primary level. Model 2a shows a negative relationship between households in the rich wealth quintile and the number of CEB. Women from polygamous households have significantly lower fertility (β=0.244; $p$<0.001). Model 3a shows the combined effects of spousal and household characteristics on women's fertility. While spousal characteristics showed a slight difference, but the same pattern of relationship with fertility as observed in model 1a, household characteristics showed significant and slightly different pattern of relationship. For example, a negative relationship is observed between the middle household wealth group and women's fertility, while the relationship between the rich households and the number of CEB is significant (β=-0.165; $p$<0.001). Also, fertility in the polygamous households showed decreased levels than what is observed in model 2a (β=-0.062; $p$<0.01).

For the Democratic Republic of Congo (DRC), model 1a shows similar pattern with that of Nigeria. The result showed significant increase in the number of CEB as spousal age increases ($p$<0.001). Additionally, an inverse but significant reduction in the number of CEB is observed as spousal age at marriage increases ($p$<0.001). The number of CEB reduced with increased spousal educational attainment. Model 2a shows a direct relationship between household wealth status, type of residence, type of marriage and fertility. Model 3a presents the combined effects of spousal and household characteristics on the number of CEB. The results show a slight difference, but the same pattern of relationship between spousal age, age at marriage, place of residence and fertility as observed in models 1a and 2a. However, an inverse relationship was observed between rich households and fertility; and also between type of marriage and fertility.

For Uganda, model 1a shows a significant increase in the number of CEB as spousal age increases ($p$<0.001), similar to the findings in previous countries. A negative, but significant relationship was also observed between spousal age at marriage and the number of CEB. A negative relationship was found between fertility and spousal educational attainment above the primary level. In model 2a, a positive relationship exists between household wealth status and fertility. Also, the relationship between place of residence, type of marriage and fertility were both positive and significant. The result of the influence of both spousal and household characteristics on fertility as presented in model 3a shows similar pattern to models 1a and 2a. However, a non-significant relationship is observed between the type of marriage and fertility; while an inverse relationship exists between the rich wealth group and fertility.

For Zimbabwe, the same pattern of relationship between spousal age, age at marriage and fertility observed in the other countries was also observed. A significant positive relationship exists between spousal age and fertility ($p$<0.001). An inverse but significant relationship also exists between spousal age at marriage and the number of CEB ($p$<0.001). An inverse relationship also exists between spousal level of education attained and fertility, both at the primary and higher levels of education. Model 2a presents the result of the influence of household characteristics on fertility. While an inverse relationship exists between household wealth status and fertility, direct and significant relationships exists between type of residence, type of marriage and fertility. The combined effects of both spousal and household characteristics on fertility as presented in model 3a showed similar pattern to models 1a and 2a.

Controlling for the female characteristics in each of the model presented for each country, a slight reduction in the effects, but similar pattern was observed across the countries. The results are presented in Tables 5a and 5b below.

**Table 2:** Percentage distribution of spousal and household characteristics from DHS data for Nigeria (2013); DRC (2013/2014); Uganda (2011) and Zimbabwe (2010/2011).

| Spousal Characteristics | Western Africa<br>Nigeria<br>n=9,021 (100%) | Central Africa<br>DRC<br>n=4,344 (100%) | Eastern Africa<br>Uganda<br>n=1,076 (100%) | Southern Africa<br>Zimbabwe<br>n=3,132 (100%) |
|---|---|---|---|---|
| **Age** | | | | |
| <25 | 406 (4.5) | 323 (7.5) | 84 (7.8) | 298 (9.5) |
| 25-34 | 2,896 (32.1) | 1,531 (35.2) | 440 (40.9) | 1,320 (42.1) |
| 35-44 | 3,859 (42.8) | 1,407 (32.4) | 365 (33.9) | 1,026 (32.8) |
| 45+ | 1,860 (20.6) | 1,083 (24.9) | 187 (17.4) | 488 (15.6) |
| **Age at marriage** | | | | |
| <20 | 1,511 (16.8) | 971 (22.3) | 311 (28.9) | 469 (15.0) |
| 20-35 | 7,163 (79.4) | 3,240 (74.6) | 751 (69.8) | 2,604 (83.1) |
| 36+ | 347 (3.8) | 133 (3.1) | 14 (1.3) | 60 (1.9) |
| **Education level** | | | | |
| No Education | 3,102 (34.4) | 225 (5.2) | 70 (6.5) | 35 (1.1) |
| Primary education | 1,937 (21.5) | 1,066 (24.5) | 680 (63.2) | 778 (24.9) |
| Secondary/Higher | 3,982 (44.1) | 3,052 (70.3) | 325 (30.3) | 2,319 (74.0) |
| **Household Characteristics** | | | | |
| **Wealth status** | | | | |
| Poor | 4,136 (45.9) | 1,863 (42.9) | 472 (43.9) | 1,212 (38.7) |
| Middle | 1,544 (17.1) | 953 (22.0) | 205 (19.1) | 564 (18.0) |
| Rich | 3,341 (37.0) | 1,528 (35.1) | 398 (37.0) | 1,357 (43.3) |
| **Type of Residence** | | | | |
| Urban | 3,090 (34.3) | 1,252 (28.8) | 153 (14.2) | 1,064 (34.0) |
| Rural | 5,931 (65.7) | 3,092 (71.2) | 923 (85.8) | 2,068 (66.0) |
| **Type of marriage** | | | | |
| Monogamy | 6,438 (71.4) | 3,618 (83.3) | 876 (81.5) | 2,941 (93.9) |
| Polygamy | 2,582 (28.6) | 725 (16.7) | 199 (18.5) | 192 (6.1) |
| **Women's characteristics** | | | | |
| **Education level** | | | | |
| No Education | 4,370 (48.5) | 883 (20.3) | 165 (15.4) | 72 (2.3) |
| Primary education | 1,714 (19.0) | 1,872 (43.1) | 691 (64.2) | 1,023 (32.7) |
| Secondary/Higher | 2,937 (32.5) | 1,589 (36.6) | 219 (20.4) | 2,038 (65.0) |
| **Occupational Status** | | | | |
| Not working | 2,876 (32.0) | 820 (19.1) | 237 (22.1) | 1,720 (55.5) |

**Table 2 (continued)**

| Spousal Characteristics | Western Africa Nigeria n=9,021 (100%) | Central Africa DRC n=4,344 (100%) | Eastern Africa Uganda n=1,076 (100%) | Southern Africa Zimbabwe n=3,132 (100%) |
|---|---|---|---|---|
| Prof.,Manag.,Techn.,clerical | 428 (4.8) | 122 (2.8) | 48 (4.4) | 143 (4.6) |
| Sales and services | 3,822 (42.5) | 977 (22.7) | 198 (18.4) | 493 (15.9) |
| Agric employee | 928 (10.3) | 2,372 (55.1) | 593 (55.1) | 403 (13.0) |
| Services/skilled/unskilled | 936 (10.4) | 11 (0.26) | - | 342 (11.0) |
| **Number of CEB** | | | | |
| None | 937 (10.4) | 273 (6.3) | 54 (5.0) | 237 (7.6) |
| 1-3 | 4,161 (46.1) | 1,748 (40.2) | 391 (36.4) | 2,048 (65.4) |
| 4+ | 3,923 (43.5) | 2,322 (53.5) | 631 (58.6) | 847 (27.1) |
| **Ever Use Contraceptives** | | | | |
| Never Used Contraceptives | 6,930 (76.8) | 2,715 (62.5) | 473 (44.0) | 469 (15.0) |
| Ever Used Contraceptives | 2,090 (23.2) | 1,629 (37.5) | 603 (56.0) | 2,663 (85.0) |

*"-" Data not available*

**Table 3:** Bivariate analysis showing the differences in women's mean number of Children Ever Born (CEB) across different categories of spousal and household characteristics

| Spousal Characteristics | Western Africa Nigeria n=9,021(SE) | Central Africa DRC n=4,344 (SE) | Eastern Africa Uganda n=1,076 (SE) | Southern Africa Zimbabwe n=3,132 (SE) |
|---|---|---|---|---|
| **Age** | | | | |
| <25 | 0.76 (0.050) | 1.03 (0.046) | 1.16 (0.120) | 0.89 (0.049) |
| 25-34 | 2.06 (0.030) | 2.65 (0.042) | 3.06 (0.086) | 1.87 (0.031) |
| 35-44 | 3.86 (0.038) | 4.91 (0.065) | 5.74 (0.132) | 3.24 (0.049) |
| 45+ | 5.34 (0.064) | 6.52 (0.087) | 7.24 (0.221) | 4.58 (0.100) |
| | F=1,079.21; $p$<0.05 | F=909.87; $p$<0.05 | F=249.13; $p$<0.05 | F=591.03; $p$<0.05 |
| **Age at marriage** | | | | |
| <20 | 4.10 (0.073) | 4.50 (0.092) | 4.90 (0.165) | 2.87 (0.048) |
| 20-35 | 3.36 (0.030) | 4.16 (0.049) | 4.38 (0.108) | 2.62 (0.036) |
| 36+ | 2.42 (0.115) | 3.83 (0.207) | 5.52 (0.865) | 2.27 (0.227) |
| | F=81.04; $p$<0.05 | F=6.84; $p$<0.05 | F=4.18; $p$<0.05 | F=5.04; $p$<0.05 |
| **Education level** | | | | |
| No Education | 3.68 (0.054) | 3.94 (0.183) | 5.10 (0.309) | 4.05 (0.377) |
| Primary education | 3.87 (0.057) | 4.47 (0.081) | 4.83 (0.120) | 3.36 (0.075) |
| Secondary/Higher | 3.07 (0.035) | 4.16 (0.052) | 3.85 (0.145) | 2.39 (0.035) |
| | F=82.46; $p$<0.05 | F=6.15; $p$<0.05 | F=13.64; $p$<0.05 | F=94.43; $p$<0.05 |
| **Wealth status** | | | | |
| Poor | 3.72 (0.045) | 4.19 (0.062) | 4.71 (0.140) | 3.04 (0.056) |
| Middle | 3.65 (0.065) | 4.45 (0.089) | 4.85 (0.222) | 2.67 (0.084) |
| Rich | 3.02 (0.037) | 4.13 (0.079) | 4.19 (0.138) | 2.29 (0.045) |
| | F=75.01; $p$<0.05 | F=4.18; $p$<0.05 | F=4.65; $p$>0.05 | F=53.47; $p$<0.05 |
| **Type of Residence** | | | | |
| Urban | 3.16 (0.041) | 3.94 (0.080) | 3.16 (0.155) | 2.16 (0.049) |
| Rural | 3.60 (0.035) | 4.34 (0.050) | 4.78 (0.103) | 2.90 (0.043) |
| | F=59.14; $p$<0.05 | F=18.27; $p$<0.05 | F=40.58; $p$<0.05 | F=113.99; $p$<0.05 |
| **Type of marriage** | | | | |
| Monogamy | 3.16 (0.030) | 4.13 (0.047) | 4.34 (0.099) | 2.60 (0.034) |
| Polygamy | 4.18 (0.056) | 4.70 (0.103) | 5.44 (0.210) | 3.31 (0.167) |
| | F=294.04; $p$<0.05 | F=25.05; $p$<0.05 | F=22.96; $p$<0.05 | F=25.88; $p$<0.05 |

**Table 4A:** Poisson Regression showing the relationship between spousal characteristics (model 1a); household characteristics (model 2a); Spousal and household characteristics (model 3a) and fertility behavior in Nigeria and the Democratic Republic of Congo (DRC).

| | Nigeria | | | Democratic Republic of Congo (DRC) | | |
|---|---|---|---|---|---|---|
| | Model 1a Coef. (SE) | Model 2a Coef. (SE) | Model 3a Coef. (SE) | Model 1a Coef. (SE) | Model 2a Coef. (SE) | Model 3a Coef. (SE) |
| **Number of CEB** | | | | | | |
| **Spousal Characteristics** | | | | | | |
| **Age** | | | | | | |
| below 25 | RC | | - | - | | - |
| 25-34 | 1.104***(0.088) | | 1.132***(0.090) | 0.995***(0.060) | | 1.005***(0.060) |
| 35-44 | 1.761***(0.087) | | 1.808***(0.089) | 1.633***(0.064) | | 1.645***(0.064) |
| 45+ | 2.106***(0.088) | | 2.155***(0.090) | 1.934***(0.066) | | 1.950***(0.068) |
| **Age at Marriage** | | | | | | |
| below 20 | RC | | - | - | | - |
| 20-35 | -0.302***(0.021) | | -0.292***(0.021) | -0.206***(0.027) | | -0.199***(0.027) |
| 36+ | -0.922***(0.057) | | -0.895***(0.058) | -0.632***(0.065) | | -0.601***(0.062) |
| **Level of Education** | | | | | | |
| no education | RC | | - | - | | - |
| primary education | 0.024(0.022) | | 0.056*(0.023) | 0.048(0.057) | | 0.060(0.057) |
| secondary/higher | -0.113(0.022) | | -0.025(0.025) | -0.026(0.063) | | 0.015(0.063) |
| **Household characteristics** | | | | | | |
| **Wealth Status** | | | | | | |
| poor | | RC | - | | - | - |
| middle | | 0.002(0.027) | -0.021(0.022) | | 0.059(0.037) | 0.007(0.030) |
| rich | | -0.153(0.032) | -0.165***(0.028) | | 0.064(0.044) | -0.022(0.044) |
| **Type of place of Residence** | | | | | | |
| Urban | | RC | - | | - | - |
| Rural | | -0.021(0.030) | 0.028(0.022) | | 0.118*(0.044) | 0.106*(0.040) |
| **Type of Marriage** | | | | | | |
| monogamy | | RC | - | | - | - |
| polygamy | | 0.244***(0.021) | -0.062**(0.018) | | 0.115***(0.032) | -0.030(0.030) |

** p < 0.05, ** p < 0.01, *** p < 0.001* *Coef. – Coefficient* *SE – Standard Error*

**Table 4B:** Poisson Regression showing the relationship between spousal characteristics (model 1a); household characteristics (model 2a); Spousal and household characteristics (model 3a) and fertility behavior in Uganda and the Zimbabwe.

| | Uganda | | | Zimbabwe | | |
|---|---|---|---|---|---|---|
| | Model 1a Coef. (SE) | Model 2a Coef. (SE) | Model 3a Coef. (SE) | Model 1a Coef. (SE) | Model 2a Coef. (SE) | Model 3a Coef. (SE) |
| **Number of CEB** | | | | | | |
| **Spousal Characteristics** | | | | | | |
| **Age** | | | | | | |
| below 25 | RC | | - | - | | - |
| 25-34 | 1.033***(0.123) | | 1.035***(0.124) | 0.779***(0.059) | | 0.802***(0.059) |
| 35-44 | 1.664***(0.121) | | 1.661***(0.123) | 1.348***(0.058) | | 1.369***(0.057) |
| 45+ | 1.913***(0.126) | | 1.912***(0.129) | 1.641***(0.064) | | 1.681*** (0.064) |
| **Age at Marriage** | | | | | | |
| below 20 | RC | | - | - | | - |
| 20-35 | -0.214***(0.038) | | -0.202***(0.037) | -0.169***(0.028) | | -0.147***(0.028) |
| 36+ | -0.447*(0.213) | | -0.421(0.218) | -0.670*** (0.120) | | -0.631***(0.109) |
| **Level of Education** | | | | | | |
| no education | RC | | - | - | | - |
| primary education | 0.041(0.080) | | 0.041(0.083) | -0.060(0.077) | | -0.010(0.068) |
| secondary/higher | -0.117(0.085) | | -0.045(0.088) | -0.248**(0.077) | | -0.112(0.069) |
| **Household characteristics** | | | | | | |
| **Wealth Status** | | | | | | |
| poor | | RC | - | | - | - |
| middle | | 0.026(0.062) | 0.006(0.042) | | -0.085*(0.042) | -0.066**(0.028) |
| rich | | 0.000(0.054) | -0.053(0.037) | | -0.150**(0.047) | -0.164***(0.034) |
| **Type of place of Residence** | | | | | | |
| urban | | RC | - | | - | - |
| rural | | 0.393***(0.079) | 0.287***(0.056) | | 0.194***(0.048) | 0.157***(0.035) |
| Type of Marriage | | | | | | |
| monogamy | | RC | - | | - | - |
| polygamy | | 0.206***(0.052) | 0.020(0.042) | | 0.188**(0.055) | 0.096*(0.041) |

** p < 0.05, ** p < 0.01, *** p < 0.001* *Coef. – Coefficient* *SE – Standard Error*

**Table 5A:** Poisson Regression showing the relationship between spousal characteristics (model 1b); household characteristics (model 2b); Spousal and household characteristics (model 3b) and fertility behavior, while controlling for women's characteristics in Nigeria and the Democratic Republic of Congo (DRC).

| | Nigeria | | | Democratic Republic of Congo (DRC) | | |
|---|---|---|---|---|---|---|
| | Model 1b Coef. (SE) | Model 2b Coef. (SE) | Model 3b Coef. (SE) | Model 1b Coef. (SE) | Model 2b Coef. (SE) | Model 3b Coef. (SE) |
| **Number of CEB** | | | | | | |
| **Spousal Characteristics** | | | | | | |
| **Age** | | | | | | |
| below 25 | RC | | - | - | | - |
| 25-34 | 1.087***(0.090) | | 1.107***(0.091) | 0.985***(0.059) | | 0.989***(0.059) |
| 35-44 | 1.715***(0.090) | | 1.753***(0.091) | 1.598***(0.064) | | 1.603***(0.064) |
| 45+ | 2.028***(0.090) | | 2.070***(0.092) | 1.888***(0.066) | | 1.893***(0.066) |
| **Age at Marriage** | | | | | | |
| below 20 | RC | | - | - | | - |
| 20-35 | -0.278***(0.021) | | -0.278***(0.020) | -0.195***(0.026) | | -0.198***(0.026) |
| 36+ | -0.821***(0.057) | | -0.822***(0.057) | -0.538***(0.062) | | -0.540***(0.062) |
| **Level of Education** | | | | | | |
| no education | RC | | - | - | | - |
| primary education | 0.024(0.023) | | 0.033(0.023) | 0.074(0.055) | | 0.075(0.055) |
| secondary/higher | -0.037(0.023) | | -0.009(0.024) | 0.075(0.061) | | 0.076(0.061) |
| **Household characteristics** | | | | | | |
| **Wealth Status** | | | | | | |
| poor | | RC | - | | - | - |
| middle | | 0.004(0.025) | -0.021 (0.022) | | 0.086*(0.036) | 0.022(0.030) |
| rich | | -0.103**(0.034) | -0.127***(0.031) | | 0.132***(0.037) | 0.021(0.036) |
| **Type of place of Residence** | | | | | | |
| Urban | | RC | - | | - | - |
| Rural | | -0.031(0.030) | 0.015(0.022) | | -0.021(0.041) | 0.028(0.035) |
| **Type of Marriage** | | | | | | |
| monogamy | | RC | - | | - | - |
| polygamy | | 0.216***(0.020) | -0.061**(0.018) | | 0.097*(0.031) | -0.032(0.028) |
| **Women's characteristics** | | | | | | |
| **Education level** | | | | | | |
| No Education | RC | - | - | - | - | - |
| Primary education | -0.065**(0.021) | -0.051(0.029) | -0.045*(0.022) | -0.036(0.025) | -0.085*(0.036) | -0.036(0.025) |
| Secondary/Higher | -0.262***(0.024) | -0.349***(0.033) | -0.213***(0.028) | -0.262***(0.036) | -0.399***(0.051) | -0.261***(0.035) |
| **Occupational Status** | | | | | | |
| Not working | RC | - | - | - | - | - |
| Prof.,Manag.,Techn.,clerical | 0.025(0.038) | 0.250***(0.043) | 0.037(0.037) | -0.064(0.074) | 0.156(0.087) | -0.062(0.073) |
| Sales and services | 0.201***(0.022) | 0.356***(0.025) | 0.209***(0.022) | 0.082(0.048) | 0.209**(0.063) | 0.084(0.047) |
| Agric employee | 0.267***(0.028) | 0.372***(0.039) | 0.241***(0.029) | 0.097*(0.038) | 0.225**(0.067) | 0.092*(0.040) |
| Services/skilled/unskilled | 0.141***(0.032) | 0.222***(0.038) | 0.150***(0.032) | -0.303(0.250) | -0.249(0.321) | -0.301(0.251) |
| **Ever Use Contraceptives** | | | | | | |
| Never Used Contraceptives | RC | - | - | - | - | - |
| Ever Used Contraceptives | 0.113***(0.019) | 0.232***(0.024) | 0.125***(0.020) | 0.098***(0.021) | 0.130***(0.027) | 0.097***(0.022) |

** p < 0.05, ** p < 0.01, *** p < 0.001* *Coef. – Coefficient* *SE – Standard Error*

**Table 5b:** Poisson Regression showing the relationship between spousal characteristics (model 1a); household characteristics (model 2a); Spousal and household characteristics (model 3a) and fertility behavior, while controlling for women's characteristics in Uganda and the Zimbabwe.

| | Uganda | | | Zimbabwe | | |
|---|---|---|---|---|---|---|
| | Model 1b Coef. (SE) | Model 2b Coef. (SE) | Model 3b Coef. (SE) | Model 1b Coef. (SE) | Model 2b Coef. (SE) | Model 3b Coef. (SE) |
| **Number of CEB** | | | | | | |
| **Spousal Characteristics** | | | | | | |
| **Age** | | | | | | |
| below 25 | RC | | - | - | | - |
| 25-34 | 0.986***(0.130) | | 0.978***(0.131) | 0.711***(0.054) | | 0.725***(0.054) |
| 35-44 | 1.566***(0.128) | | 1.558***(0.129) | 1.255***(0.053) | | 1.268***(0.053) |
| 45+ | 1.810***(0.135) | | 1.805***(0.137) | 1.563***(0.060) | | 1.590***(0.060) |
| **Age at Marriage** | | | | | | |
| below 20 | RC | | RC | - | | - |
| 20-35 | -0.197***(0.037) | | -0.192***(0.037) | -0.126***(0.030) | | -0.121***(0.031) |
| 36+ | -0.428(0.213) | | -0.410(0.211) | -0.615***(0.104) | | -0.597***(0.099) |
| **Level of Education** | | | | | | |
| no education | RC | | RC | - | | - |
| primary education | 0.079(0.077) | | 0.069(0.078) | -0.024(0.062) | | 0.005(0.059) |
| secondary/higher | 0.028(0.084) | | 0.042(0.084) | -0.133*(0.062) | | -0.068(0.059) |
| **Household characteristics** | | | | | | |
| **Wealth Status** | | | | | | |
| poor | | RC | | | - | - |
| middle | | 0.061(0.061) | 0.021(0.042) | | -0.024(0.037) | -0.038(0.026) |
| rich | | 0.071(0.053) | -0.019(0.038) | | -0.082(0.047) | -0.127***(0.034) |
| **Type of place of Residence** | | | | | | |
| Urban | | RC | | | - | - |
| Rural | | 0.282***(0.075) | 0.236***(0.056) | | 0.134**(0.043) | 0.124***(0.032) |
| **Type of Marriage** | | | | | | |
| monogamy | | RC | | | - | - |
| polygamy | | 0.157**(0.050) | 0.016(0.042) | | 0.189**(0.056) | 0.109*(0.046) |
| **Women's characteristics** | | | | | | |
| **Education level** | | | | | | |
| No Education | RC | RC | | - | | |
| Primary education | -0.149***(0.041) | -0.358***(0.048) | -0.146**(0.042) | -0.062(0.059) | -0.315***(0.063) | -0.047(0.059) |
| Secondary/Higher | -0.494***(0.066) | -0.795***(0.082) | -0.445***(0.068) | -0.257***(0.061) | -0.621***(0.063) | -0.187**(0.061) |
| **Occupational Status** | | | | | | |
| Not working | RC | - | | - | - | - |
| Prof.,Manag.,Techn.,clerical | 0.060(0.135) | 0.187(0.149) | 0.106(0.133) | -0.278*** (0.044) | 0.003(0.057) | -0.200***(0.045) |
| Sales and services | 0.009(0.055) | 0.100(0.073) | 0.045(0.055) | -0.059(0.032) | 0.111**(0.037) | -0.009(0.031) |
| Agric employee | 0.058(0.046) | 0.109(0.063) | 0.043(0.046) | 0.043(0.030) | 0.101*(0.135) | 0.013(0.030) |
| Services/skilled/unskilled | - | | | -0.059(0.033) | 0.025(0.044) | -0.018(0.033) |
| **Ever Use Contraceptives** | | | | | | |
| Never Used | RC | - | - | - | - | - |
| Ever Used | 0.097*(0.037) | 0.228***(0.045) | 0.117**(0.038) | 0.405***(0.057) | 0.522***(0.066) | 0.402***(0.055) |

** p < 0.05, ** p < 0.01, *** p < 0.001* *Coef. – Coefficient* *SE – Standard Error*

## Discussion

This study examined spousal and household characteristics influencing fertility in four countries in sub-Saharan Africa. The spousal characteristics were age, age at marriage and level of education attained while the household characteristics included household wealth status, type of residence and type of marriage. Findings from the study clearly showed that while some characteristics influenced fertility similarly across countries, some other characteristics influenced fertility differently. For example, spousal age at marriage between ages 20 and 35 years across the countries is an indication of cultural expectation of men to be married at a particular age, which is usually above that of their wives. Also at the bivariate and multivariate levels of analyses, it was evident that both spousal age and age at marriage influenced fertility similarly across the countries. The number of CEB corresponded with increase in spousal age across the countries at the bivariate and the multivariate levels of analyses. Also, a reduction in the number of CEB was observed across the countries based on the result of the Poisson regression models. These findings suggest that in situations where the spousal age and age at marriage are higher than those of the women (which in most cases is the situation in SSA), patriarchy may be at play as spouses have the final say as regards the number of children born. These findings support Caldwell's theory of using children as old age security. It may also mean that men who marry late prefer to have fewer children. In that regard, increased age at marriage among men could complement efforts to lower fertility levels by increasing women's age at marriage. This could be a long-term effort to lower fertility in SSA.

The level of educational attainment among the husbands was higher across the countries. Above the primary level education may have led to increased household wealth, with a positive impact on contraceptive use. However, compared with other countries where most spouses attained secondary or higher level of education, three in five married women in Uganda had only primary level education. At the bivariate level of analyses, while a progressive reduction was observed in the mean number of CEB as spousal level of educational attainment increased in Uganda and Zimbabwe, reduction was only observed among those who had above the primary level in Nigeria and the DRC. At the multivariate level of analysis, an inverse relationship was found between women's number of CEB and spousal level of educational attainment above the primary level for Nigeria, DRC and Uganda; an inverse relationship was observed both at the primary and post-primary levels for Zimbabwe. These findings suggest that the relationship between spousal education and women's fertility differ across the countries. Additionally, the findings are also consistent with those of previous studies that spousal education significantly predicted fertility intentions and contraceptive use among couples (Assefa, Berhane, Worku, & Tsui, 2012; Berhane, 2015; DeRose & Ezeh, 2005). Further, having secondary or higher level of education increases the likelihood of reducing fertility on the long run.

With respect to household characteristics, the relationship between household wealth status and fertility seem to play out the same way in Nigeria and Zimbabwe and in DRC and Uganda at the bivariate level of analysis, but differently at the multivariate level across all countries. Whereby an inverse relationship was observed between the middle and the rich class in terms of wealth and number of CEB in Zimbabwe and Nigeria. But for DRC and Uganda, a direct relationship was observed. However, for the two countries at the multivariate level, a direct relationship was noted across the classes. These findings are similar to that of Adebowale et al. (2014) and Yihunie Lakew et al. (2011), who found contraceptive use was greater among the rich. It is important to note that while increase in household wealth status may act to further lower fertility in Nigeria

as in Zimbabwe, it may not really be so in the DRC and Uganda. This again may depend on the spousal level of education and household structures in place among other indicators of development.

Further findings from this study showed that at the bivariate and multivariate levels of analyses, rural residence was found to be a significant predictor of high fertility. This again suggests low use of contraceptive in the rural areas consistent with the findings of Yihunie Lakew et al. (2011) in their study of geographical variation in contraceptive use in Ethiopia. This is not surprising because most households were in the rural areas and that efforts aimed at fertility reduction often marginalized rural dwellers in favor of urban dwellers. Additionally, urban dwellers are usually more educated. Polygamy was found to be associated with high fertility across the countries at the bivariate level of analysis, but a mixed result was found across the countries at the multivariate level of analysis, especially at the third models where an indirect relationship was observed for Nigeria and DRC, while a slight change in the relationship was observed for Uganda and Zimbabwe. The prevalence of monogamous marriages across the countries suggests greater tendencies towards modernization and westernization as concluded by Hayase and Liaw (1997). When women attain higher levels of education, combined with their spousal level of educational attainment, there is a higher likelihood of rapid fertility decline in the region.

## Conclusion

The fact that spousal age and age at marriage tend to influence fertility the same way as women's age and age at marriage is points to the cultural expectations and practices of marriage in SSA. Findings from this study showed that spousal educational attainment is very important in predicting fertility levels across the countries. This also indicates that men must be fully involved for persistent decline in fertility levels, particularly in those regions presently experiencing stalls in fertility decline. Among the household characteristics examined, household wealth was the most important predictor of fertility across the countries. This finding suggests that household wealth status is likely to have worked through the medium of spousal and women's' educational attainment to influence fertility. This is clearly shown in the model where women's characteristics were controlled for (Tables 5a & 5b). Policies aimed at further reduction of fertility in countries experiencing stalled or early fertility decline need to pay close attention to both men and women's educational advancements.

## Acknowledgements:

The authors express their gratitude to "Consortium for Advanced Research Training in Africa" (CARTA) for supporting this research. CARTA is jointly led by the African Population and Health Research Center and the University of the Witwatersrand and funded by the Wellcome Trust (UK) (Grant No: 087547/Z/08/Z), the Carnegie Corporation of New York (Grant No--B 8606.R02), Sida (Grant No:54100029)" The statements made and views expressed are solely the responsibility of the authors.

The authors also thank the ICF Macro International and MEASURE DHS for giving them permission to access data.

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