**The Demography of Polygyny in sub-Saharan Africa:**

**Trends, Compositional Effects, and Implications for Inequality**

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**Abstract:** This paper makes several contributions to the literature on family change in Africa, with attention to the intersection between demography and inequality. First, we use micro-data from 125 Demographic and Health Surveys (DHS) across 38 sub-Saharan African (SSA) countries to provide updated descriptive estimates of how the prevalence of polygyny has changed over time and across contexts. In so doing, we reflect upon demographic transformations that have affected SSA countries, thus shifting the age distribution of the population and impacting what we label the "demographic sustainability of polygyny." Next, we test whether there is evidence that polygyny has decreased with modernization processes by exploring the association between polygyny and wealth at both national and sub-national levels. Finally, we assess the implications of changes in the socio-economic composition of polygynous families for sub-national wealth inequalities between households. Our preliminary results show a close connection between polygyny estimates from DHS and the demographic sustainability of the phenomenon.

**Keywords:** Polygyny, Demography, Family, sub-Saharan Africa, Inequality

**Introduction**

Polygyny—the practice of men marrying more than one wife—is a defining feature of family life throughout Sub-Saharan Africa (SSA). In many Western African countries—including Nigeria, Cote D'Ivoire, Cameroon, Mali, and Benin—between 20 and 30 percent of women report being in a polygynous union (Jacoby, 1995; Westoff, 2003). Polygyny is common in Eastern and Southern Africa as well, although prevalence is on average lower (e.g., between 10 and 20 percent). Although polygyny has been observed in other parts of the world, Sub-Saharan Africa is the only major region of the world where polygyny continues to be widely practiced.

For several decades, scholars have speculated that that the prevalence of polygyny in Africa will decline due to modernization, urbanization, and the spread of ideas about Western nuclear families (Clignet, 1970). Contrary to these expectations, polygyny has remained widespread in Africa; nonetheless, the practice of polygyny has changed in important dimensions. Historically, polygyny was a high socio-economic status phenomenon and the practice was most common in royal and noble families or among high-earning merchants who could afford to support multiple wives and children (Bosman, 1705). In contemporary Africa, polygynous households are on average lower socio-economic status and more likely to live in rural areas (Jewkes, 2005).

Despite the importance of polygyny for family life in Africa, sociologists and demographers lack a systematic understanding of how the prevalence and practice of polygyny has changed over time across diverse African contexts. While polygyny has been a subject of sustained interest in anthropology, the focus has been on understanding patterns of kinship and the determinants of polygyny, often in a single case study context (Goody, 1975). Likewise, the public health literature has explored the consequences of polygyny for health and well-being outcomes, with less attention to how the practice has changed over time (Amankwaa, 1996; Hadley, 2005; Smith-Greenaway & Trinitapoli, 2014; Strassmann, 1997). As a result, there have been few—if any—cross-national comparative attempts to quantify how the practice of polygyny

has changed over time throughout Africa and formally test whether declines in polygyny conform to the expectations of theories about modernization and family change. In light of the massive demographic transformations that have affected Africa, and the heterogeneous stages of the demographic transition African countries have been undergoing, there is also a question of whether changes in polygyny over time are – at least partly – a function of shifting age distributions and changes in the marriage market. Has polygyny declined because it has become more "demographically unsustainable"?

Understanding changes in polygyny is also key to understanding the linkages between family demography and inequality in contemporary Africa. The shifts in polygyny from a high to low-SES phenomenon will have important implications for the intergenerational transmission of advantage given that polygynous families will on average have less resources to share among more people.

This paper makes several contributions to the literatures on family change in Africa, with attention to the intersection between demography and inequality. First, we use micro-data from Demographic Health Surveys to provide updated estimates of how the prevalence of polygyny has changed over time and over birth cohorts. To the best of our knowledge, this represents one of the first cross-national comparative attempts to quantify in a demographically savvy way how the practice of polygyny has changed over time throughout Africa. In so doing, we reflect upon demographic transformations that have affected SSA countries, thus shifting the age distribution of the population and impacting what we label the "demographic sustainability of polygyny," i.e. the fraction of men who can marry two wives with the remaining men on the marriage market being able to find a partner. Next, we explore the association between polygyny and wealth at both national and sub-national levels to test whether there is evidence that polygyny has been decreasing with modernization processes. Finally, we assess the implications of changes in the socio-economic composition of polygynous families for sub-national wealth inequalities between households.

**Polygyny in sub-Saharan Africa**

Polygyny has been an important component of African family life for centuries and has been widely practice throughout the continent. Historically, the institution of polygyny served important social and economic functions including providing agricultural labor in hoe-based societies and cementing marital alliances between disparate families and tribes (Boserup, Tan, & Toulmin, 2013; Goody, 1975; Heath, 1958; Jacoby, 1995). Polygyny was often also an important measure of social status in contexts where wealth was measured in having many offspring (Johnson Hanks, 2006).

At the start of the seventeenth century during the onset of the colonial encounter, polygyny was most prevalent among high-status men such as royalty or wealthy merchants (Bosman, 1705). Very wealthy men often had anywhere between three and ten wives; the first wife was often higher status and ran the household, whereas other lower rank wives participated in agricultural labor and other domestic tasks. The higher prevalence of polygyny in Western Africa—compared to Eastern or Southern Africa—is often attributed to differential agricultural production and the proliferation of hoe-based agriculture (Jacoby, 1995).

In the second half of the twentieth century, scholars speculated that polygyny would decline with modernization, urbanization, and the spread of ideas about Western nuclear families (Clignet, 1970). These expectations about the decline of polygyny were part of a larger constellation of theories about how the institution of the family would be shaped by modernization processes. In the demographic literature, classic demographic transition theory posited that socio-economic development—including urbanization, modernization and industrialization—would change the structural conditions that produce high fertility and lead to lowered fertility rates (Freedman, 1979; Hirschman, 1994). In the sociological literature, it was argued that industrialization and urbanization would lead to declining importance of the extended family, causing family patterns to converge to nuclear family found in Western Europe and North America (Goode, 1963).

At present, theories predicting a linear relationship between modernization and family change are viewed as overtly deterministic, incomplete, and unrepresentative of the complex array of family forms that emerged in the second half of the twentieth century (Cherlin, 2012; Hirschman, 1994). This has been also the case in sub-Saharan Africa, where defining features of family life—such as very high fertility and widespread prevalence of polygyny—have defied the expectations of theories related to modernization and family change (Bongaarts & Casterline, 2013; Westoff, 2003).

Nonetheless, there have been important changes in the institution and practice of polygyny over time. Although polygyny was historically associated with wealth, polygynous households are on average lower socio-economic status, more rural, and more highly associated with adverse health and well-being outcomes (Amankwaa, 1996; Hadley, 2005; Smith-Greenaway & Trinitapoli, 2014; Strassmann, 1997). There may be a number of explanations for changes in polygyny. Proximity to colonial and missionary education in the colonial era are strongly associated with lower rates in the current practice of polygyny throughout Africa; however contemporary educational systems have no significant effect on women's probability of entering into a polygynous union (Fenske, 2015). Likewise, agricultural development is hypothesized to be a driving force behind declining polygyny in Cote D'Ivoire as women's agricultural labor became less valuable (Jacoby, 1995).

**Polygyny, family structure and wealth inequality**

Although family change is often viewed as the domain of scholars of the family and wealth inequality is the focus of the scholars of social stratification, there is increasing recognition that these processes are interlinked. For example, rising educational homogamy has arguably contributed to wealth inequality in the United States by concentrating more resources into the hands of highly-educated couples who are also high earners (Schwartz, 2010).

There is strong rationale for focusing on patterns of wealth inequality in Africa. Although sub-Saharan Africa is the region of the world with the second-highest level of wealth inequality as measured by the Gini coefficient (followed only by Latin America) (Deininger & Squire, 1996), research on stratification in Africa is limited, and very little research investigates the linkages between family change and stratification. One exception comes from Pesando (2017), who finds that increases in positive educational assortative mating increases accounts for between 3 and 10% of cohort-level inequality in household wealth. Following Pesando, we argue that shifts in polygyny from a high to low-SES phenomenon may have important implications for the intergenerational transmission of advantage given that polygynous families will on average have less resources to share among more people.

**Data & Analytical Strategy**

This paper uses micro-data from Demographic Health Surveys (DHS) to explore trends in polygyny and their implications for wealth inequalities in sub-Saharan Africa. DHS are publicly available nationally representative cross-sectional surveys of women ages 15-49 collected by ICF International in collaboration with host country governments; standardized questionnaires facilitate cross-national comparisons. We use 125 DHS survey waves from 38 sub-Saharan African countries collected between 1985 and 2016 (Table 1). Because our analysis is conducted at the woman level, we are providing estimates for the prevalence of polygyny among the population of women of reproductive age, as opposed to at the household level. As a supplement, we plan to also calculate polygyny prevalence at the household level using information from DHS household rosters. To assess the demographic sustainability of polygyny we instead draw data from the United Nations World Population Prospects (WPP), 2017 revision. Lastly, information on wealth is obtained from the International Wealth Index (IWI) computed and harmonized by the Global Data Lab.

Polygyny is calculated from a DHS question about the number of other wives that the respondent's partner has (this question has been collected in the DHS from the 1980s onwards). Women who responded 0 were coded as monogamous and women who responded with a value of 1 or higher were coded as polygynous. The sample is limited to women who report being married or living with a partner. Women who report not knowing if their husband has another wife are excluded from the analysis. It is plausible that some of the women who report being in monogamous relationships at present will become polygynous at a later point (e.g. if their husband takes on more wives in the future or if they are widowed and remarry).

First, we provide descriptive estimates of how the prevalence of polygyny has changed over time, over birth cohorts, and over education. In future estimates, we plan to produce estimates using age and education-standardization to minimize bias due to age structure and educational differences between countries.

Using data from the WPP 2017 revision, we estimate an index of "demographic sustainability of polygyny" (**gamma**) that aims to provide evidence of the extent to which changes in polygyny over time are – at least partly – due to changes in the marriage market. This index is a crude indicator of the demographic sustainability of polygyny to the extent that it measures the fraction of men who can have two wives, with the remaining men on the marriage market being able to find a partner. It is shaped by age structure, sex ratio at birth, and gender differences in child and early-adult mortality and is computed as follows. Let's denote:

$$(1 + \text{gamma}) = [(\text{share of women ages 20-25}) / (\text{share of men ages 30-35})]$$

$$p = \text{proportion of men with 2 wives}$$

then a "clearing of the marriage market" implies

$$2p + (1-p) = 1+\text{gamma}$$

$$p+1 = 1 + \text{gamma}$$

hence $\mathbf{p = gamma}$

In other words, the fraction of men who can have two wives is equal to the ratio of (women ages 20-25/men ages 30-35)-1, which is gamma. The main hypothesis is that in early stages and late stages of the demographic transition polygyny is harder to sustain.

Next, we assess the association between SES and polygyny to formally test whether there is evidence that polygyny has been decreasing with wealth and/or modernization processes. At the sub-national level, we explore how the association between SES (as measured using a composite index of assets and education) and polygyny has changed over time. At the national level, we explore the association between country-level development (as measured by the Human Development Index) and polygyny, to understand whether development corresponds with reductions in polygyny at the national level.

Finally, we assess the implications of changes in the socio-economic composition of polygynous families for sub-national wealth inequalities between households. We use the IWI to look at how the observed variance in wealth inequality in the most recent cohorts would be different if these cohorts had followed the patterns of polygyny observed in the earliest cohorts.

**Descriptive Results**

*Trends in the demographic sustainability of polygyny (gamma parameter)*

As expected, the indicator computed to capture the demographic sustainability of polygyny (gamma) varies significantly between 1950 and 2016 (Figure 1), typically from a modestly low level (age structure typical of a low life expectancy at birth scenario prior to fertility decline), to fairly high during periods of rapid population growth, and then declining again as a result of fertility decline (and impacts of the HIV/AIDS epidemic). There is important variation across regions, with Southern Africa following the clearest path in terms of demographic transition stages, and Western Africa experiencing the mildest increases in the parameter, only recently (~2000) followed by an incipient decline. Figure 2 also provides evidence of significant variation between countries within regions.

*Trends in polygyny estimated from DHS data*

Figure 3 documents the prevalence of polygyny among women of reproductive age in sub-Saharan Africa in the oldest and most recent DHS. Figure 3 demonstrates that there have been declines in polygyny over time in many—although not all—countries with available data. Nonetheless, polygyny remains common throughout all major regions of sub-Saharan Africa.

In Western Africa—the region with the highest prevalence of polygyny—there are seven countries where the prevalence of polygyny is very high (e.g. between 40% and 60%) in the first-time period (e.g. Senegal, Guinea, Liberia, Mali, Burkina Faso, Benin and Togo). However, in all but two of these countries—Burkina Faso and Guinea— the prevalence of polygyny falls from very high to high (e.g. between 20% and 40%) by the most recent DHS. In an additional 7 Western African countries, the polygyny prevalence in high in the first time period (e.g. Sierra Leone, Ghana, Ivory Coast, Nigeria, Niger, Chad, Cameroon). In two Western African countries—Liberia and Ghana—polygyny falls to medium prevalence (e.g. between 10 %and 20%) by the most recent DHS.

On average polygyny is more prevalent in Western Africa than in Central, Eastern, and Southern Africa in both time periods. In the latter three regions, during the first-time period, the prevalence of polygyny ranges from low (e.g. less than 10%) in one country (e.g. Madagascar) to medium (e.g. between 10% and 20%) in five countries (e.g. Namibia, Zimbabwe, Zambia, Ethiopia, Congo Brazzaville) to high (e.g. between 20% and 40%) in six countries (e.g. Mozambique, Malawi, Tanzania, Uganda, Kenya and the DRC). However, unlike in Western Africa, there are no countries in the "very high" prevalence category in the first-time period in the Central, Eastern, or Southern regions. By the most recent DHS there are three countries in the "low" prevalence category (e.g. Namibia, Zimbabwe, and Madagascar) and several countries in the "medium" prevalence category (e.g. Mozambique, Malawi, Kenya, Ethiopia, Gabon, Congo Brazzaville).

Figure 4 documents changes over time in polygyny by birth cohort upon disaggregating by region and women's educational level. In all four regions, there is a clear educational gradient whereby polygyny is highest among the least educated women and lowest among the most educated women. Nonetheless, there are regional differences in the prevalence of polygyny. In the earliest birth cohorts, polygyny prevalence among women with no education is about 20% in Southern Africa, 30% in Eastern Africa, 40% in Central Africa, and 55% in Western Africa.

Although there is some evidence of the polygyny prevalence of low-educated women converging to resemble the prevalence of women with more education, there are consistent gaps between polygyny prevalence in the most and least educated women. For example, in Western Africa—where declines in polygyny have been most dramatic—in the earliest birth cohorts (e.g. 1935-1950) polygyny was almost 55% for women with no education compared to about 20% for women with higher education. By the most recent birth cohorts (e.g. 1990 to 2000) polygyny was about 25% for women with no education compared to about 10% for women with higher education. Thus, despite an overall decline in polygyny, low-educated women have polygyny prevalence about twice as high as those of high-educated women in both older and younger birth cohorts. Similar trends hold for the other three regions as well (although overall declines in polygyny have been smaller in the Eastern and Southern regions). Nonetheless, these results do not take into account changes in the educational distribution of women over subsequent birth cohort.

Preliminary results in Figure 5 also show that polygyny estimates from DHS data are closely and positively related to the demographic sustainability of polygyny (gamma), thus suggesting that shifting age distributions and changes in the marriage market are strong determinant of polygyny patterns, particularly across Western and Central Africa. In what follows, we aim to net out these compositional factors from DHS polygyny estimates.

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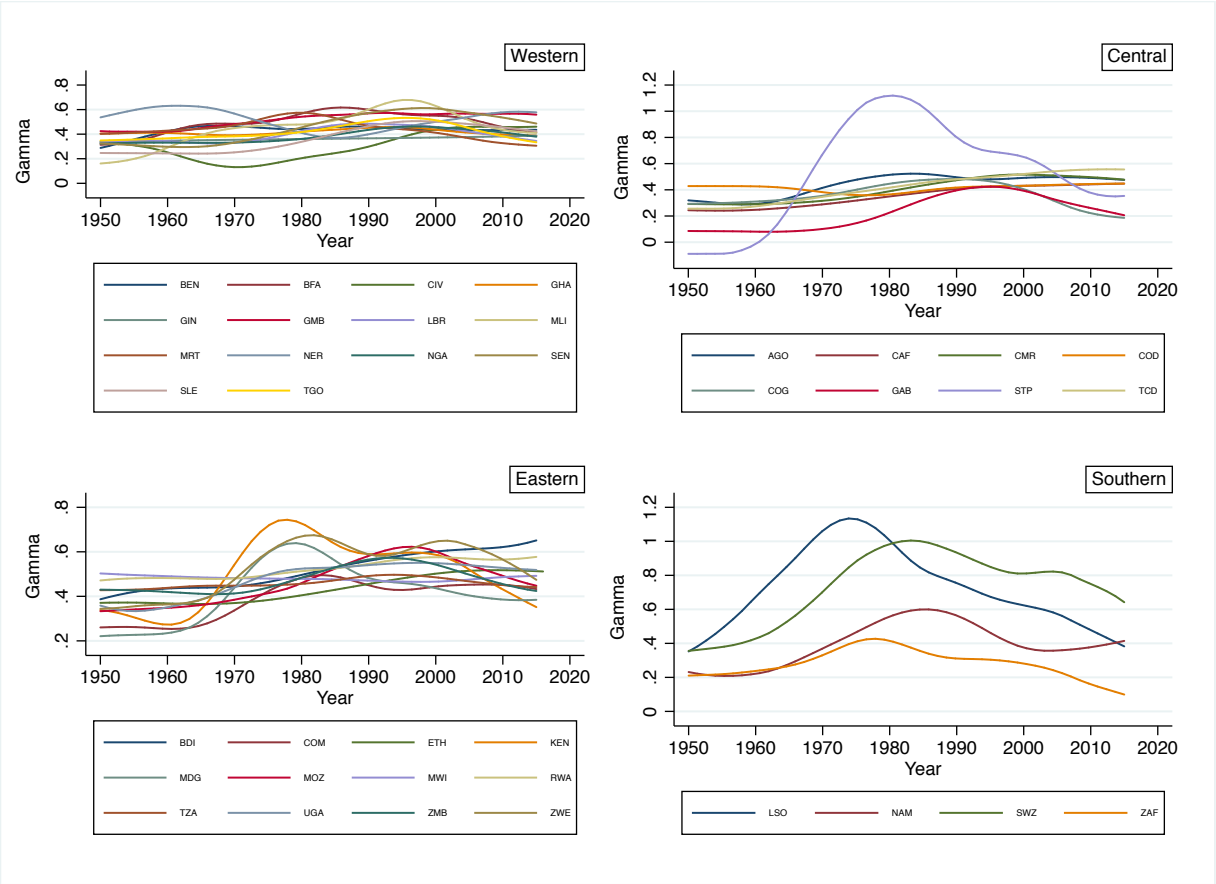
**Table 1.** Countries included in the analysis, with number of waves and observations, by region

| Western (14 countries - 51 waves) | Central (8 countries - 16 waves) | Eastern (12 countries - 51 waves) | Southern (4 countries - 7 waves) |
|---|---|---|---|
| Benin | Angola | Burundi | Lesotho |
| 1996 (4,256) | 2015 (7,872) | 1987 (2,608) | 2014 (3,424) |
| 2001 (4,570) | Cameroon | 2010 (5,193) | Namibia |
| 2006 (13,355) | 1991 (2,724) | Comoros | 1992 (2,012) |
| 2011 (11,631) | 1998 (3,512) | 1996 (1,630) | 2000 (2,362) |
| Burkina Faso | 2004 (7,131) | 2012 (3,187) | 2006 (3,118) |
| 1993 (5,085) | 2011 (9,265) | Ethiopia | 2013 (2,845) |
| 1998 (5,030) | Central African Republic | 2000 (9,373) | South Africa |
| 2003 (9,532) | 1994 (4,054) | 2005 (8,546) | 1998 (4,682) |
| 2010 (13,374) | Chad | 2011 (10,143) | Swaziland |
| Cote d'Ivoire | 1996 (5,726) | 2016 (9,756) | 2006 (1,734) |
| 1994 (5,240) | 2004 (4,403) | Kenya | |
| 1998 (1,711) | 2014 (13,327) | 1989 (4,767) | |
| 2011 (6,401) | Congo | 1993 (4,555) | |
| Gambia | 2005 (3,807) | 1998 (4,830) | |
| 2013 (6,879) | 2011 (6,626) | 2003 (4,762) | |
| Ghana | Congo, Democratic Republic | 2008 (4,961) | |
| 1988 (3,147) | 2007 (5,976) | 2014 (8,820) | |
| 1993 (3,201) | 2013 (12,188) | Madagascar | |
| 1998 (3,226) | Gabon | 1992 (3,505) | |
| 2003 (3,680) | 2000 (3,445) | 1997 (4,328) | |
| 2008 (2,925) | 2012 (4,390) | 2003 (4,923) | |
| 2014 (5,422) | Sao Tome and Principe | 2008 (11,325) | |
| Guinea | 2008 (1,615) | Malawi | |
| 1999 (5,510) | | 1992 (3,477) | |
| 2005 (6,239) | | 2000 (9,345) | |
| 2012 (6,770) | | 2004 (8,363) | |
| Liberia | | 2010 (15,329) | |
| 1986 (3,597) | | 2015 (15,852) | |
| 2007 (4,343) | | Mozambique | |
| 2013 (5,792) | | 1997 (6,154) | |
| Mali | | 2003 (7,834) | |
| 1987 (2,932) | | 2011 (8,287) | |
| 1995 (8,058) | | Rwanda | |
| 2001 (10,657) | | 1992 (3,689) | |
| 2006 (12,166) | | 2000 (4,878) | |
| 2012 (8,710) | | 2005 (5,448) | |
| Mauritania | | 2010 (6,804) | |
| 2000 (4,207) | | 2014 (6,812) | |
| Niger | | Tanzania | |
| 1992 (5,224) | | 1991 (6,035) | |
| 1998 (6,108) | | 1996 (5,279) | |
| 2006 (7,402) | | 2004 (6,734) | |
| 2012 (9,474) | | 2010 (6,246) | |
| Nigeria | | 2015 (8,119) | |
| 1990 (6,673) | | Uganda | |
| 2003 (5,131) | | 1988 (3,047) | |
| 2008 (23,793) | | 1995 (4,885) | |
| 2013 (27,090) | | 2000 (4,494) | |
| Senegal | | 2006 (5,231) | |
| 1986 (3,358) | | 2011 (5,180) | |
| 1992 (4,424) | | Zambia | |
| 1997 (5,870) | | 1992 (4,455) | |
| 2005 (10,068) | | 1996 (4,919) | |
| 2010 (10,795) | | 2001 (4,713) | |
| 2012 (5,794) | | 2007 (4,277) | |
| 2014 (5,816) | | 2013 (9,570) | |
| 2015 (6,046) | | Zimbabwe | |
| Sierra Leone | | 1994 (3,766) | |
| 2008 (5,241) | | 1999 (3,546) | |
| 2013 (10,575) | | 2005 (4,862) | |
| Togo | | 2010 (5,290) | |
| 1988 (2,453) | | 2015 (5,939) | |
| 1998 (5,974) | | | |
| 2013 (6,317) | | | |

**Figure 1.** Trends overtime in the demographic sustainability of polygyny (gamma parameter), by region of SSA

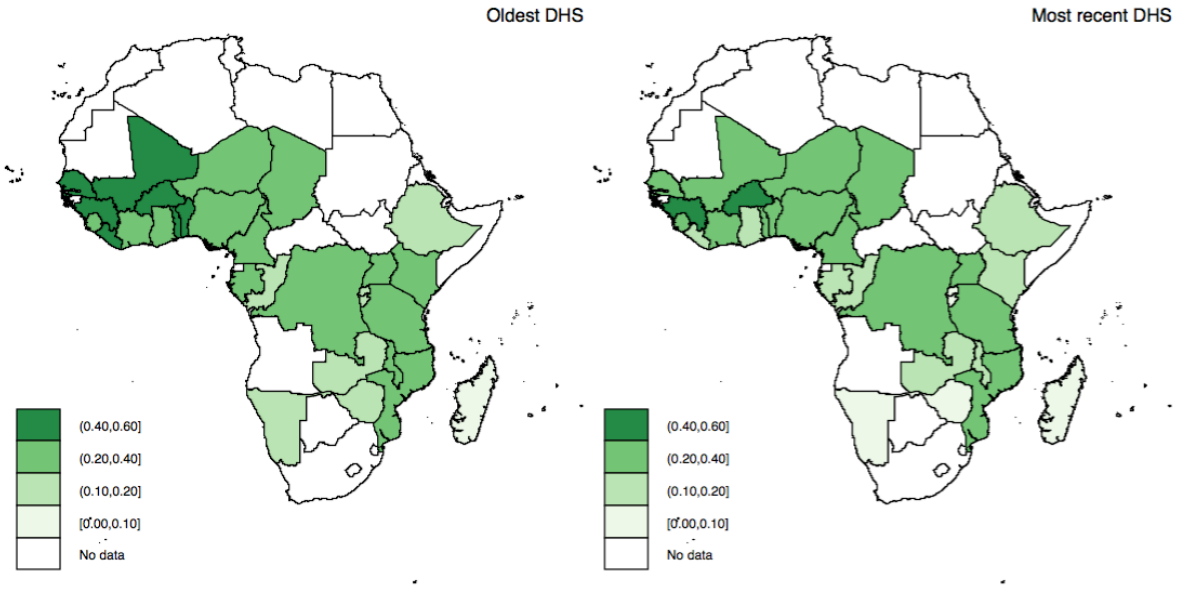

*Source*: Authors' calculations from the World Population Prospects (WPP), 2017 Revision

**Figure 2.** Trends overtime in the demographic sustainability of polygyny (gamma parameter), by country of SSA, grouped by region



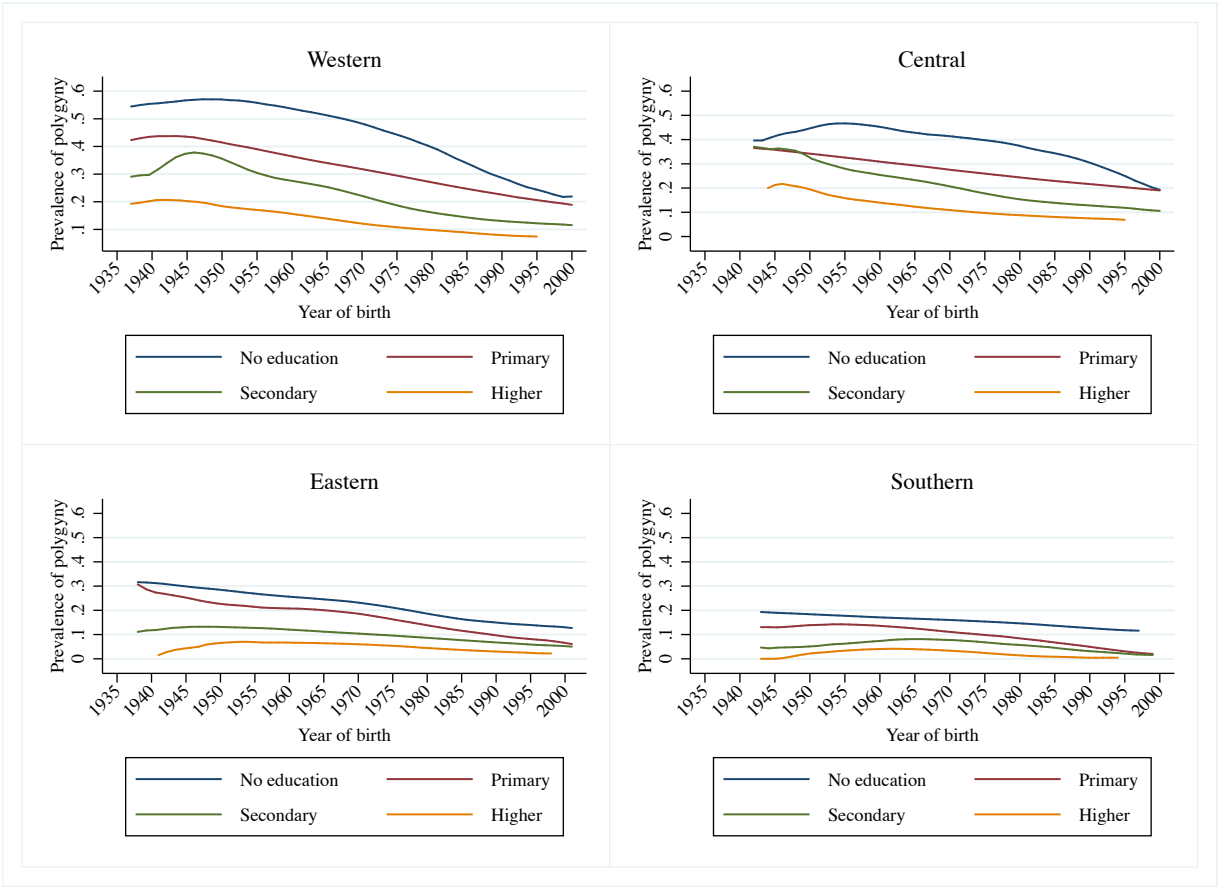

*Source*: Authors' calculations from the World Population Prospects (WPP), 2017 Revision

**Figure 3.** Comparison of prevalence of polygyny in the oldest (left) and most recent (right) DHS among women of reproductive age.



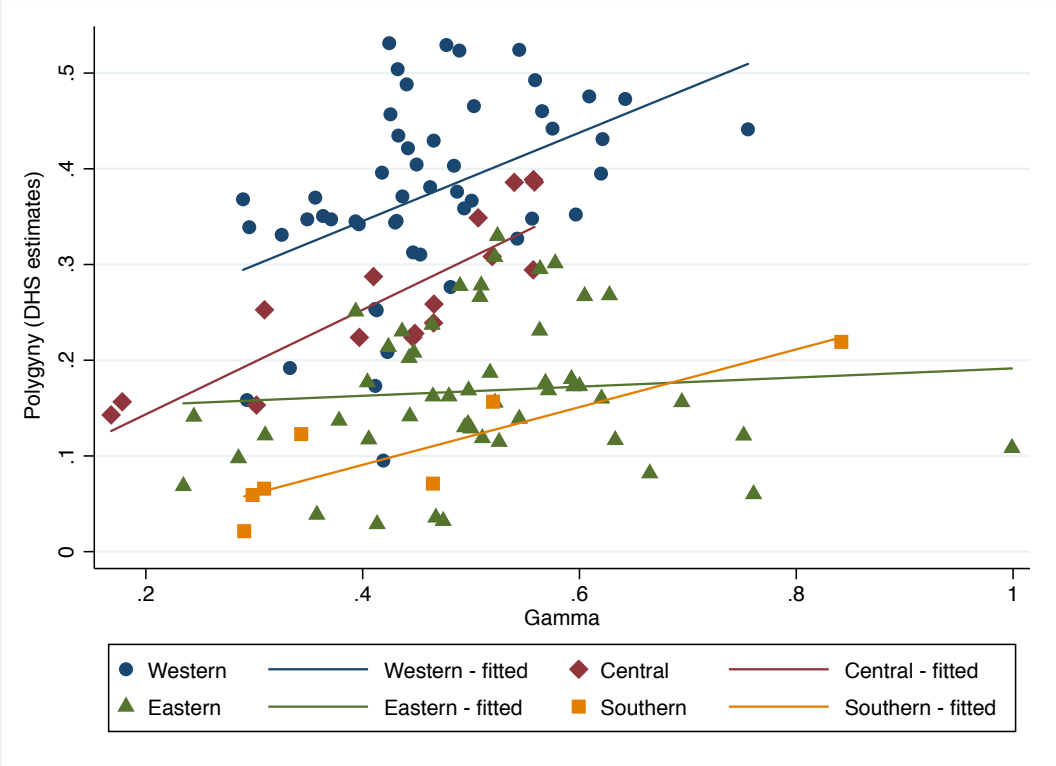

*Source*: Authors' calculations from Demographic and Health Surveys (DHS)

**Figure 4**. Prevalence of polygyny among women of reproductive age by birth cohort disaggregated by region and educational level




*Source*: Authors' calculations from Demographic and Health Surveys (DHS)

**Figure 5**. Relationship between demographic sustainability of polygyny (gamma) and DHS estimates of polygyny, by region




*Source*: Authors' calculations from Demographic and Health Surveys (DHS) and World Population Prospects, 2017 Revision