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The Transformation of Polygyny in Sub-Saharan Africa

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Abstract

As the rest of the developing world, Sub-Saharan Africa has experienced profound transformations in the institution of marriage. Yet, unlike most other regions, polygyny has remained widespread across the subcontinent. There is, however, evidence to suggest that the practice of polygyny is declining and that selection into polygynous unions based on sociodemographic characteristics is increasing as sub-Saharan Africa undergoes rapid sociocultural, demographic, and economic change. Using data from 111 Demographic and Health Surveys conducted in 27 countries since the 1990s, we study recent trends in the prevalence of polygyny among currently married women, examine sociodemographic characteristics of women in polygynous unions, and test whether selection on these characteristics into polygynous unions has increased over time. We find that, net of other factors, the likelihood of being in a polygynous union has declined in most countries. We show that women who are less educated, non-Christian, and living in rural areas are more likely to be in a polygynous union and that in many countries, selection into polygynous unions on these characteristics has been growing. These findings contribute to the broader literature on marital and family change by providing new insights into recent trends in and patterns of polygyny across the subcontinent.

Introduction

Like the rest of the world, sub-Saharan Africa has experienced significant changes in the institution of marriage over the past half-century. Although marriage remains largely universal, age at first marriage has increased (Bongaarts, Mensch, and Blanc 2017; Marston et al. 2009), the practice of marriage payment (bridewealth) has declined (Anderson 2007; Bishai and Grossbard 2010; Chae, Agadjanian, and Hayford 2021), informalization of partnerships has grown (Antoine and Marcoux 2014; Calvès and N'bouke 2018; Nappa et al. 2019), and individual spousal choice has become more common (Loforte 2000; Meekers 1995; Smith 2001). There is also evidence to suggest that polygyny, a form of marriage in which a man is married to more than one woman, is declining and that selection into such unions based on sociodemographic characteristics is increasing across the subcontinent (Fenske 2015; Tabutin et al. 2020; Whitehouse 2018). Altogether these changes in the marriage system have been part of broader rapid sociocultural, demographic, and economic transformations in sub-Saharan Africa. While the extent and pace of these changes

vary, virtually all sub-Saharan countries have witnessed rising levels of female education (Barro and Lee 2013), improvements in women's status (Hanmer and Klugman 2016), rapid urbanization (United Nations Population Division 2018), greater exposure to mass media (Thussu 2018), and increased economic development (Frankema 2021).

Various theories, including developmental idealism (Thornton 2013) and Second Demographic Transition (Lesthaeghe 2010), link these socioeconomic transformations to changes in marital and family life and posit that, as developing societies industrialize, marriage and family forms would converge toward the Western family model—conjugal family—as it existed in the mid-twentieth century (Goode 1963; Lesthaeghe 2010; Thornton 2013). Marriage would shift from being a social institution, arranged by a couple's parents with the purpose of solidifying bonds between families, to being more individualized (Goode 1963), characterized by “romantic love, shared interests, and companionship in a spouse” (Cherlin 2012). A growing body of literature shows that, as sub-Saharan Africa undergoes modernization, the diffusion of Western ideals about marriage, including that of monogamy, has been increasing, particularly in urban areas (Antoine and Marcoux 2014; Calvès and N'bouke 2018; Garenne 2004; Harwood-Lejeune 2001; Nappa et al. 2019; Whitehouse 2018). Taken together, these changes may be contributing to shifts in marriage patterns across the subcontinent, including declines in the prevalence of polygyny and changing selection into these unions (Tabutin et al. 2020; Whitehouse 2018). Though these transformations of the institution of marriage are taking place, to varying degrees, in all African countries, they are occurring at different rates within countries. Like most social transformations, many of these changes are first observed among the social elites, primarily the well-educated in large urban centers, before diffusing to the less educated and those living in smaller towns and rural areas (Antoine and Marcoux 2014; Calvès and N'bouke 2018; Garenne 2004; Harwood-Lejeune 2001; Mensch, Singh, and Casterline 2005; Nappa et al. 2019).

In this study, we examine the practice of polygyny and its evolution since the 1990s, a period in which sub-Saharan Africa has experienced accelerated sociocultural, demographic, and economic transformations and rapid integration into the global economy. We use data from the Demographic and Health Surveys (DHS) to assess trends in the prevalence of polygyny and the characteristics of women in polygynous unions in 27 sub-Saharan countries. First, we investigate whether the practice of polygyny is declining and whether this decline varies by union order (first vs. non-first union). We find that, in almost all countries, the prevalence of polygyny has indeed decreased and that this decrease is generally greater for women in first unions compared to those in non-first unions. Next, we examine select sociodemographic characteristics of women in polygynous unions and test whether selection into such unions on these characteristics is increasing over time. We observe that women who are less educated, non-Christian (i.e., Muslims or those who adhere to other religions), and living in rural areas are more likely to be in polygynous marriages. We also show that selection into polygynous unions is indeed growing over time, but that it varies by country. Our study contributes to the broader literature on marital and family change by providing a comprehensive overview of recent trends in and patterns of polygyny across the subcontinent.

Background

Polygyny in sub-Saharan Africa

Polygyny exists, though to varying degrees, in almost all sub-Saharan countries. Its prevalence is generally highest in Western Africa, followed by Central, Eastern, and Southern Africa (Lesthaeghe, Kaufmann, and Meekers 1989; Tabutin and Schoumaker 2004). Within countries, polygyny levels also vary considerably, reflecting differences in sociocultural traditions as well as in economic patterns. Polygyny predates the arrival of Islam and Christianity to the subcontinent (Zeitzen 2020) and though its prevalence is higher among Muslims (Hayase and Liaw 1997; Klomegah 1997), it is practiced across religious lines, including among Christians and those belonging to other, mainly traditional religions (Agadjanian 2020; Reniers and Tfamily 2008). Across the subcontinent, polygyny is present in both patrilineal and matrilineal societies, with prevalence generally higher in the former (Goody 1973; White and Burton 1988). The prevalence of polygyny also tends to be greater in rural areas, particularly where reliance on subsistence agriculture (vs. pastoralism) is high and women's contributions to agricultural production are significant (Boserup et al. 2013; Goody 1976; Jacoby 1995); (Klomegah 1997). Furthermore, polygyny has historically been a symbol of men's social prestige and wealth (Zeitzen 2020). Wealthy men as well as those in positions of power, such as village chiefs, who could afford multiple bridewealth payments and support a larger family, were more likely to have several wives.

Conditioned by sociocultural and economic factors, the practice of polygyny has also contributed to sustained population growth. Across sub-Saharan Africa, where pronatalism is strongly ingrained, children are highly valued not only for the potential labor they can provide but also as a source of wealth, a marker of social status, and insurance for their elderly parents (Caldwell 1976, 2005). In addition, like other regions before the epidemiological transition, the subcontinent has suffered from high rates of child mortality. Polygyny thus served as a means to ensure that a man produces enough offspring, especially males, to continue his lineage (Klomegah 1997; Muhsam 1956). The option to marry another woman was particularly important if the first wife did not bear any children (Meekers and Franklin 1995). Moreover, in societies that prohibited women's sexual intercourse for an extended period after the birth of a child, polygyny allowed men to have continuous sexual relations (Blanc and Gage 2000; Hillman 1970; Lesthaeghe 1994; Meekers and Franklin 1995). Furthermore, large spousal age differences and higher male mortality, mainly due to violence and war, often resulted in an excess number of women versus men on the marriage market (Ember 1974), and polygyny helped reduce this imbalance (Hillman 1970). Also, by augmenting the pool of potential husbands, polygyny allowed divorced and widowed women to remarry quickly (Goody 1976). In some cases, a widowed woman married a brother of her deceased husband, who may already be married, which allowed her and her children to be supported by her husband's extended family (Garenne and Van de Walle 1989; Hillman 1970; Murdock 1959; Palmore 1987).

Rapid sociocultural, demographic, and economic change across the subcontinent

Over the past century, sub-Saharan Africa has experienced rapid sociocultural, demographic, and economic transformations. Many of these changes began with the arrival of European

Christian missionaries in the nineteenth century and continued under European colonial rule, which in most of the subcontinent lasted until the mid-twentieth century. During this time, missionaries not only attempted to proselytize locals to the Christian faith but were also involved in building schools and introducing Western education to the local population, especially in areas under British rule (Frankema 2012; Gallego and Woodberry 2010). Since the end of the colonial period, education levels, particularly among women, have risen greatly, with mean years of women's education increasing from 0.97 years in 1950 to 4.65 years in 2010 (Barro and Lee 2013). Yet, even more so than in the past, significant regional heterogeneity exists in women's education levels, with Southern and Eastern Africa having the highest levels and Western and Central Africa having the lowest (Graetz et al. 2018; Hyde 1993). Within countries, variation also exists, particularly by religion and place of residence, with women's education levels generally higher among Christians and those in urban areas (Alesina et al. 2020; Graetz et al. 2018; Hyde 1993). Higher educational attainment is not only beneficial because it improves women's economic outcomes, including access to better employment opportunities, enhanced economic productivity, and higher earnings (Hill and King 1993), but also because it raises women's status by increasing their agency and empowerment (Eger, Miller, and Scarles 2018; Hanmer and Klugman 2016; Kabeer 2005; Murphy-Graham 2010).

For the past several decades, sub-Saharan Africa has seen the fastest population growth in the world. In contrast to other developing regions that are well advanced in their fertility transition, that is, are near or at replacement level, the fertility decline in the subcontinent began relatively late and has proceeded slowly (Bongaarts 2017). Additionally, the onset and pace of this decline have varied quite widely, with countries in southern Africa further along in their transition (Tabutin et al. 2020). Furthermore, the subcontinent has experienced rapid urbanization over the past half-century (United Nations Population Division 2018), with the share of urban population increasing from 15 percent in the 1960s to 41 percent in 2020 (Tabutin et al. 2020). Similar to other indicators, country-level variation exists in the percentage of the population living in urban areas, ranging from 14 percent urban in Burundi to 90 percent in Gabon (World Bank 2021).

Despite significant economic progress made over the past few decades, sub-Saharan Africa remains the poorest and least developed region of the world. The World Bank classifies all countries, except Gabon, Namibia, and South Africa, as low-income (\$1,045 or less in gross national income (GNI) per capita) or lower-middle income (\$1,046–4,095 in GNI per capita) (World Bank 2021). While living conditions have greatly improved across the subcontinent, socioeconomic disparities, particularly between urban and rural areas, have grown as wealth is increasingly concentrated in cities and towns (Sahn and Stifel 2003). In addition, there exists a great deal of wealth inequality, especially in urban centers (Brockerhoff and Brennan 1998). As urban populations increase in size, work opportunities have not grown at the same pace, leaving many residents unemployed or underemployed. The high living costs in cities and towns further exacerbate urban poverty.

Transformation of polygyny in a rapidly changing societal context

Some six decades ago, Goode (1963) predicted that, as sub-Saharan Africa modernizes and its marriage system converged toward the conjugal family, polygyny would disappear from the subcontinent. Yet, even at the turn of the century, polygyny remained widespread with little signs of decline (Marcoux 1997; Tabutin and Schoumaker 2004; Van de Walle 2006). More recent research, however, has established that polygyny is, in fact, declining in many parts of the subcontinent (Fenske 2015; Tabutin et al. 2020; Whitehouse 2018). Like most other social transformations, the pace of this decline differs by region and population segments within countries. The reasons for polygyny's decline are varied and likely linked to many of the sociocultural, demographic, and economic transformations that have taken place over the past several decades.

In areas where they settled, European Christian missionaries were not only instrumental in building schools, providing health care, and converting locals to their faith but they also played an influential role in shaping values and norms, including those surrounding marriage. Because polygyny conflicts with Christian tenets, missionaries highly discouraged this practice, and in some churches, individuals in polygynous unions were refused full membership (Baloyi 2013; Hillman 1970, 1975; Notermans 2002). The discordance between polygyny and Christian teachings partly contributed to the proliferation of African Independent Churches (AICs), which adapted themselves to local customs and practices, including greater tolerance of polygyny (Agadjanian 2020; Anderson 2001; Hillman 1975). AICs likely contributed to polygyny remaining part of the marriage system even as increasing numbers of Africans converted to Christianity.

In many areas under colonial rule, polygyny was not permitted by law (Falen 2008). Yet, even today, despite legislation banning this practice in a number of sub-Saharan countries, including Benin, Côte d'Ivoire, and Guinea, it remains widespread (Tertilt 2006). While anti-polygyny laws might have deterred the formation of some polygynous unions, their impact is likely limited because many of these laws apply solely to civil unions, and such unions remain uncommon, as most couples are married through customary or religious ceremonies. On a similar note, a number of countries have explicitly prohibited levirate marriages, that is, when a widowed woman marries her husband's brother or other male relative, due to concerns about the forced nature of such unions (Kudo 2018, 2021). While this practice is becoming less common, it continues to persist across many parts of the subcontinent.

Although today the practice of polygyny is most common in sub-Saharan Africa (and a few predominantly Muslim countries in the Middle East and Asia), this form of marriage historically existed in many societies across the world, including in Europe, the Americas, and Asia (Murdock 1967), and the decline and disappearance of polygyny there may inform our assessment of recent and future trends of polygyny across the sub-Sahara. Gould, Moav, and Simhon (2008) theorized that the disappearance of polygyny (and the corresponding rise in monogamy) in developed societies is a consequence of increasing variation in the social quality of women, as measured by human capital, and women's ability to raise higher quality children. Guided by the quantity-versus-quality trade-off assumption, they proposed that higher quality men in these societies increasingly preferred marrying higher

quality (i.e., more educated) women. Fenske (2015) tested this theory using education as a marker of human capital in an analysis of data from the DHS in 34 African countries. His study failed to find evidence that increasing levels of education explained the decline in polygyny; however, it is worth noting that his analysis did not consider increases in women's educational attainment over time as access to education grew and became more common. This is potentially problematic because the meaning and implications of the "quality" of a woman born in the 1950s with a few years of education are likely different than that of a woman born in the 1990s with a similar level of education. Failure to acknowledge this changing "quality," as reflected in a woman's educational attainment, could have resulted in this null finding.

In addition, as education levels have risen so has women's status, particularly with respect to their agency and empowerment (Eger, Miller, and Scarles 2018; Hanmer and Klugman 2016; Kabeer 2005; Murphy-Graham 2010). This has likely contributed to women increasingly selecting their own spouse and envisioning a companionate union for themselves (Cole and Thomas 2009), which for most women, is incompatible with polygyny. In fact, several studies have demonstrated women's wide disapproval of polygyny and growing preference for a monogamous union (Aluko and Aransiola 2003; Falen 2008; Meekers and Franklin 1995).

Traditionally, the practice of polygyny ensured population growth, helped maintain family lineages, and reduced sex imbalances in the marriage market. Today, however, many of the social rationales for the existence of polygyny have diminished. For example, sub-Saharan Africa has experienced significant reductions in child mortality, which has consequently resulted in more offspring surviving to adulthood and contributed to declines in desired fertility (Bongaarts and Casterline 2013). Moreover, as more women pursue higher levels of education and/or enter the paid workforce, the timing of the first marriage is increasingly delayed (Bongaarts, Mensch, and Blanc 2017), which reduces the number of women in the marriage market, and in turn, sex imbalances on it.

In an age of rapid modernization, the economic rationale for the persistence of polygyny and the high costs associated with it may also be contributing to its decline in sub-Saharan Africa. As the locus of the population shifts to urban areas and fewer families rely on subsistence agriculture for their livelihood, the benefit of having more wives, and consequently, a larger family, to increase agricultural productivity is diminishing. Moreover, compared to rural areas, polygyny is often viewed as incompatible with urban life, due to higher living costs and more limited living space (Blanc and Gage 2000). The high costs of bridewealth, as they are increasingly to be shouldered by individual men rather than their families, might also deter some men from taking more than one wife, even if the amount of bridewealth is lower when marrying a previously married woman. At the same time, the economic costs of and corresponding social penalties for remaining unmarried for divorced or widowed women have declined. As education levels have risen, women have greater access to income-generating opportunities. Thus, the economic pressure to remarry (often into a polygynous union) and to do so quickly, may have decreased for women who can work and support themselves and their children. Furthermore, the social pressure to

remarry has also diminished as it has become increasingly acceptable for women to remain unmarried, particularly in urban areas.

Hypotheses

Reflecting on the reviewed literature, our central theoretical presumption is that, over the past several decades, sub-Saharan Africa has experienced various sociocultural, demographic, and economic transformations that have led to changes in the institution of marriage across the subcontinent. These changes have, most notably, culminated in a shift in the nature of marriage, from being a component of a broader kinship and family system to that of an individualized couple relationship. Based on this presumption, we propose several hypotheses about the changing prevalence of polygyny and characteristics of women in polygynous unions.

As the institution of marriage evolves across the subcontinent, we expect to observe declines in the likelihood of being in a polygynous union even after adjusting for sociodemographic, marital, and childbearing characteristics. We also hypothesize that the pace of these declines is greatest in countries that have experienced more extensive sociocultural, demographic, and economic transformations.

H1: The likelihood of being in a polygynous union relative to being in a monogamous union has declined over time.

H2: The pace of polygyny decline is greater in countries that have experienced more socioeconomic development.

Despite increases in age of first marriage, marriage has remained nearly universal across the subcontinent. Because divorced or widowed women are, on average, older than never married women seeking a spouse, they may have fewer options for a monogamous union, compared to never married women, and therefore should be more likely to remarry into a polygynous union.

H3: The likelihood of being in a polygynous union has declined faster for women in first unions compared to those in non-first unions.

Considering the sociocultural, demographic, and economic reasons for the persistence of polygyny, we expect to observe selection of polygyny on key sociodemographic characteristics. Like many past and current transformations across the subcontinent, social change tends to begin with the better educated and those living in urban areas. This is similarly, though somewhat less consistently, also observed along religious lines as Christians are more likely to embrace Western influences than Muslims or adherents of other, mainly indigenous, religious traditions. We therefore expect selection into polygynous unions to increase over time by education, place of residence, and religion, after controlling for sociodemographic, marital, and childbearing characteristics.

H4: Less educated women are increasingly more likely than more educated women to be in a polygynous union over time.

H5: Rural women are increasingly more likely than urban women to be in a polygynous union over time.

H6: Muslim women and those belonging to other non-Christian religions are increasingly more likely than Christian women to be in a polygynous union over time.

Although all countries in sub-Saharan Africa have experienced profound transformations over the past several decades, the speed and intensity of these changes have varied across the subcontinent. In light of this heterogeneity, as well as variation in marriage patterns and customs, we do not expect that our proposed hypotheses will find equally strong support across the 27 countries in our study sample. As we present our findings, we will attempt to explain some of the country-level variations that emerge from our analysis.

Data

We address our research questions and test our hypotheses using data from the DHS.¹ The DHS, conducted approximately every five years in many low- and middle-income countries, are nationally representative household surveys that collect data on a range of topics, including marriage, education, and spousal characteristics. DHS samples are based on a stratified two-stage cluster design in which primary sampling units are typically drawn from census enumeration areas, after which households are randomly selected within each cluster. In selected households, all women, aged 15–49, living in the household are invited to participate in the survey.

From its inception in 1984, the DHS program has collected data in almost all sub-Saharan African countries. Our study uses data from 27 of these countries in which two or more survey rounds have been conducted, a 10+ year gap exists between the earliest and latest surveys, and information on key variables was collected. These data, collected from the early 1990s to the late 2010s, add up to a total of 111 survey-years and include countries from all regions of the subcontinent: 11 in Western Africa, 3 in Middle Africa, 11 in Eastern Africa, and 2 in Southern Africa. Together these countries represent 77 percent of sub-Saharan Africa's total population. These countries, along with their survey years, are listed in Table 1. For each country, we pooled all rounds of data (meeting the above criteria) to generate consecutive birth cohorts of women. Thus, our analytic sample is composed of currently married women aged 15–49 born between 1940 and 2004.² The total sample size in each country ranges from 4,925 women in Comoros to 91,969 women in Nigeria.

Measures

The DHS collects information on key marriage characteristics. Survey questions cover, but are not limited to, current marital status, polygyny status (of current marriage), and the number of times married (once or more than once). Because the focus of this study is on polygyny, we construct a measure indicating whether a married woman is in a polygynous union using responses to the following question: "Does your (husband/partner) have other

¹We use data from both the IPUMS-DHS (Boyle, King, and Sobek 2017) and DHS programs.

²Currently married also includes women who reported living together with a man as if married. Hereafter, we refer to these individuals as currently married.

wives, or does he live with other women as if married?” Women who answered “Yes” are coded as being in a polygynous marriage; women who answered “No” or “Don’t know” are coded as being in a monogamous marriage.³ We also classify women by union order (first union vs. non-first union). A respondent who reports having been married more than once is coded as being in a non-first union; all other women are coded as being in a first union.

We test whether a country’s pace of polygyny decline, as measured by the annual rate of change in the prevalence of polygyny between the earliest and latest surveys, varies according to differential exposure to socioeconomic development over the past several decades. We proxy this exposure using the most recent values of the Human Development Index (HDI) (UNDP 2020), an index that is frequently used to measure a country’s level of development. The HDI is a summary measure that captures multiple dimensions of development, including health, education, and standard of living, with higher values indicating greater levels of development. While admittedly imperfect in capturing all the various changes experienced by a country, the HDI is the best global and comparable measure available to summarize many of these changes.

We examine several sociodemographic characteristics of women in polygynous unions. To test whether the likelihood of being in a polygynous union has declined over time, we group women into 10-year birth cohorts from the 1940s to 2000s. We also consider differences in polygyny status by place of residence (urban vs. rural) and religion (Christian, Muslim, Other). Because the DHS did not collect comparable data on religion over time in all countries in the study sample, we do not consider religion in countries where these data are not available.⁴ Furthermore, we investigate how polygyny varies by education. Although the DHS collects data on women’s educational attainment, we use a different education measure—relative education score—to take into account increases in absolute levels of educational attainment over time. Over the past half-century, education levels, particularly among women, have risen considerably across the subcontinent (Barro and Lee 2013). Thus, if the social quality of a woman in the marriage market is reflected in her educational attainment, then a woman with primary-level education in the 1960s would likely be viewed as highly educated while a woman with the same level of education in the 2010s would be viewed differently. By measuring women’s relative education score among those in the same birth cohort, we can better capture the changing quality of a woman, as reflected by her educational attainment.⁵ In our study, this relative education score indicates where a woman falls in her country’s education distribution (0–100) among women of the same age group at a given point in time, that is, survey year. To construct this score, we group women into five-year age groups (e.g., 15–19, 20–24, ..., 45–49) and their educational attainment into five categories (no schooling, incomplete primary, complete primary, incomplete secondary, and

³In 78 survey-years, fewer than 1 percent of women answered “Don’t know” to this question; in 26 survey-years, between 1 and 5 percent; and in 7 survey-years, 5 percent or more. We obtained similar regression results when we excluded women who reported “Don’t know” from analyses.

⁴The following five countries lack comparable data on religion: Comoros, Niger, Rwanda, South Africa, and Tanzania. In Comoros, Niger, and Rwanda, excluding religion should have minimal effect on the analyses given that either Christianity (in Rwanda) or Islam (Comoros and Niger) is by far the predominant religion.

⁵We construct relative education scores using a formula that has been used in the migration literature to ascertain how a migrant’s level of education compares with those of the same age and sex in the origin country (Chae and Glick 2019; Feliciano 2005; Ichou 2014).

complete secondary).⁶ Next, we determine where a woman is positioned in her country's distribution of educational attainment for women of the same age group and the same survey year. Finally, we sum the percentage of women belonging to the same age group who have completed less education than she has with half the percentage of women of the same age group who have completed the same level of education as she has. To illustrate the construction of this measure, this is how we calculate the relative education score for a 22-year-old woman in Ghana in 2014. In this year, Ghanaian women in the 20–24-year age group have the following education distribution: 24 percent have no education, 13 percent have incomplete primary education, 9 percent have completed primary education, 39 percent have incomplete secondary education, and 15 percent have completed secondary education. Thus, a 22-year-old woman with complete primary education has a relative education score of 42 percent (24 percent + 13 percent + 9 percent \times 0.5), indicating that her educational attainment is greater than or the same as 42 percent of women belonging to the same age group. Hence, this woman would be comparable to a Ghanaian woman of the same age with incomplete primary education in 1993 because their relative education scores are the same.⁷

Lastly, we include several other relevant characteristics in our analysis. We control for woman's age because the likelihood of being in a polygynous union generally increases with age. Due to ethnic differences in the practice of polygyny, we also control for ethnicity. In countries where the DHS did not collect comparable information on ethnicity across survey years, we include region of residence in our models instead. We adjust for premarital birth history because, in many African societies, having a premarital birth is perceived negatively and can constrain a woman's options on the marriage market, possibly increasing her likelihood of entering into a polygynous union. If a woman reports that the date of her first birth precedes the month and year of her first marriage, she is coded as having had a premarital birth. We also control for spousal age difference (four years or less, 5–9 years, 10+ years, don't know) and spousal education difference (same or lower, higher, don't know) because these characteristics can influence a woman's likelihood of being in a polygynous union.

Methods

In the first part of the analysis, we calculate the prevalence of polygyny in each country using data collected from all available birth cohorts, that is, from the 1940s to early 2000s.⁸ We present these statistics for all women as well as by union order, that is, first unions versus non-first unions. We also calculate the percentage change and the annual rate of change in the prevalence of polygyny between the earliest and latest surveys and examine whether a correlation exists between the annual rate of change in the prevalence of polygyny and the HDI. Next, we use logistic regression to study whether the probability of

⁶We based these categories on the education systems in each country. If the classification of primary and secondary school changed over time, we used the latest classification.

⁷In 1993, Ghanaian women in the 20–24-year age group have the following education distribution: 35 percent have no education, 14 percent have incomplete primary education, 8 percent have complete primary education, 42 percent have incomplete secondary education, and 2 percent have complete secondary education.

⁸The following countries lack data from women born in the 1940s: Ethiopia, Gabon, Liberia, and Sierra Leone. The following countries lack data from women born in the 2000s: Burkina Faso, Comoros, Gabon, Ghana, Kenya, Madagascar, Mozambique, Namibia, Niger, and Togo.

being in a polygynous union has declined over time after controlling for sociodemographic (age, ethnicity/region, education, religion, place of residence), marital (union order, spousal age difference, spousal education difference), and childbearing (had premarital birth) characteristics. Specifically, we test whether women from later birth cohorts are less likely to be in a polygynous union than those from earlier cohorts, net of other factors. Afterwards, we include an interaction term between union order and birth cohort in regression models to examine whether the probability of being in a polygynous union varies by union order over time. We test for this interaction effect by computing the second difference in the effect of union order and birth cohort for each possible cohort-pair comparison (e.g., 1950s vs. 1960s, 1950s vs. 1970s) and assessing whether each of these differences is statistically significant (Mize 2019). If one or more of these cohort-pair comparisons is statistically significant ($p < 0.05$), then we denote this relationship as statistically significant in Figure 3.

In the second part, using the same models described above, we test our hypotheses on the association of women's polygyny status with their key sociodemographic characteristics—education, religion, and place of residence. We also investigate if, as polygyny declines, there is increasing selection of women with these three characteristics into polygynous unions. In separate models, we include interaction terms between the birth cohort and each of these characteristics. We follow similar procedures as described above to test whether these interaction effects are statistically significant.

In all regression analyses, we exclude women born in the earliest and latest birth cohorts, 1940s and 2000s, respectively, because these women make up a relatively small fraction of the analytic sample, making it difficult to convincingly determine whether they are at risk of being in a polygynous union. Furthermore, we exclude surveys conducted in the early 1990s that did not collect data on husband's age because we lack information on spousal age difference.⁹ All regression analyses are conducted at the country level and use sampling weights.

Results

Is the practice of polygyny declining?

First, we present our results on general trends in the prevalence of polygyny. The left panel of Figure 1 displays the prevalence of polygyny among all currently married women between the earliest and latest survey years. Countries found below the 45-degree line experienced a decline in the prevalence of polygyny. This figure demonstrates considerable variation in polygyny levels. In the earliest surveys, polygyny levels ranged from 4 percent in Madagascar to 53 percent in Guinea. In the latest surveys, it varied from 2 percent in South Africa to 42 percent in Burkina Faso. In all countries, except Chad, Madagascar, and Niger, the prevalence of polygyny declined significantly ($p < 0.05$) between the earliest and latest surveys. The middle panel of Figure 1 presents the prevalence of polygyny among women in first unions. Overall, polygyny levels are similar or slightly lower to those found

⁹The following surveys did not collect data on spousal age: Burkina Faso 1993, Cameroon 1991, Ghana 1993, Kenya 1993, Madagascar 1992, Malawi 1992, Namibia 1992, Niger 1992, Nigeria 1990, Rwanda 1992, Senegal 1992–1993, Tanzania 1991–1992, Tanzania 1996, Uganda 1995, Zambia 1992, Zimbabwe 1994.

among all currently married women. The right panel of Figure 1 shows the prevalence of polygyny among women in non-first unions. The pattern observed for these women is different from that of women in first unions: Polygyny levels are noticeably higher among women in non-first unions, while also varying considerably across countries. In the earliest surveys, the prevalence of polygyny in this group ranged from 6 percent in Madagascar to 67 percent in Guinea, and in the latest surveys it varied from 5 percent in South Africa to 66 percent in Guinea. In contrast to first unions, where almost all countries experienced significant declines in polygyny, 14 countries experienced such a decline ($p < 0.05$) among women in non-first unions while 11 countries observed no significant change and two countries (Chad and Niger) experienced significant increases between the earliest and latest surveys.

While Figure 1 demonstrates the declining prevalence of polygyny in most countries, it does not clearly convey the magnitude of this change. Thus, Table 2 presents the percentage change in the prevalence of polygyny among currently married women between the earliest and the latest surveys. Overall, substantial variation exists in the percentage change in polygyny, ranging from no change in Niger to a 68 percent decline in South Africa. The median decline was 29 percent. Because the interval between the earliest and latest survey years varied by country, we also calculated the annual rate of change in the prevalence of polygyny during this period. This change varied from no change in Niger to a 6 percent decline per year in South Africa, with a median decline of 2 percent per year. Because women in first unions make up a significant proportion of all currently married women, similar patterns were observed among this group. Among women in non-first unions, in contrast, we observe that the percentage change in polygyny is noticeably smaller and sometimes positive. This change ranged from a 15 percent increase in Madagascar to a 61 percent decline in South Africa. The median decline was 12 percent. Similarly, the annual rate of change in the prevalence of polygyny varied from +1 percent per year in Madagascar to -5 percent in South Africa, with a median decline of 1 percent per year.

Next, we examine whether women from younger birth cohorts are less likely to be in a polygynous union after controlling for sociodemographic, marital, and childbearing factors related to polygyny. In Table 3, we find a strong negative relationship between birth cohort and polygyny in all countries, except Madagascar and Niger, supporting H1 that a woman's likelihood of being in a polygynous union relative to that of a monogamous union has declined over time. Results in this table also confirm our descriptive finding that women in non-first unions are more likely to be in a polygynous union than women in first unions, even after adjusting for potential confounders. In addition, we test whether the effect of union order varies by education (Figure A1 in the Supporting Information). Results indicate that, in most countries, greater educational selectivity into polygynous unions exists among women in first unions. Women in first unions with higher relative education scores are significantly less likely to be in polygynous unions than those with lower scores. In contrast, there is little to no educational selection among women in non-first unions.

Given that the probability of being in a polygynous union is declining over time, we test whether the pace of this decline varies according to differential exposure to socioeconomic development over the past several decades, as measured by the HDI. Figure 2 shows a

strong negative relationship between HDI and the annual rate of change in the prevalence of polygyny between the earliest and latest surveys. As we hypothesized (H2), the pace of polygyny decline is faster in countries with higher HDIs. This relationship is similarly observed for women in both first and non-first unions.

As the probability of being in a polygynous union declines over time, we examine whether this decline is experienced differently by women in first unions versus non-first unions by including an interaction term between union order and birth cohort in regression models. Figure 3 presents predicted probabilities of being in a polygynous union by union order and birth cohort. In 12 countries, we find evidence in support of H3 that there is increasing selection of previously married women into polygynous unions. In most of these countries, this is due to women in first unions experiencing significantly greater declines in the probability of being in a polygynous union over time, while in Chad, Niger, and Nigeria, previously married women experienced significant increases in the likelihood of this type of union.

Is there increasing selection into polygynous unions on key sociodemographic characteristics?

We now examine the sociodemographic characteristics of women in polygynous unions and investigate how these characteristics are changing in the context of declining polygyny. First, we present descriptive statistics of women's education, place of residence, and religion by polygyny status (Table 4). With relatively few exceptions, women in polygynous unions have noticeably lower relative education scores than their counterparts in monogamous unions. This is true in both the earliest and latest surveys. We also observe that women in polygynous unions experienced greater declines in relative education scores, that is, evidence of increasing selection of less educated women into polygynous unions. In almost all countries, a higher proportion of women in monogamous unions live in urban areas than those in polygynous unions. We also note that the percentage of women in monogamous unions living in urban centers increases over time more considerably compared to that of women in polygynous unions. With respect to religion, we generally find that a higher proportion of women in polygynous unions tend to be Muslim or belong to other (i.e., mostly traditional) religions compared to women in monogamous unions. In fact, over time in most countries, polygyny is increasingly concentrated among Muslim women and those belonging to other religions.

Before presenting results of the regression models testing for increasing selection into polygyny, we examine whether selection into polygyny exists on key sociodemographic characteristics, net of other factors (Table 3). Across most countries, we find that women with higher relative education scores and those living in urban areas have significantly lower odds of being in a polygynous union. We also observe that, in most countries with data on religion, Muslim women and those belonging to other religions, have significantly higher odds of being in a polygynous union than Christian women. Much of this selection appears to be driven by education differentials as we find evidence of greater educational selectivity into polygyny by place of residence and/or religion in many countries in our sample (Figures A2 and A3 in the Supporting Information). For instance, the likelihood of

being in a polygynous union declines as relative education scores increase for women living in urban areas and Christian women (vs. those living in rural areas and Muslims or followers of other non-Christian religions).

Next, we examine whether select sociodemographic characteristics of women in polygynous unions have been changing as the practice of polygyny has declined. We first investigate whether the association between education and polygyny varies across birth cohorts. In Figure 4, we present predicted probabilities of polygyny by birth cohort for women with low and high relative education scores, 25 percent and 75 percent, respectively. In 17 countries, the probability of polygyny varies by education over time. In most of these countries, less educated women are increasingly more likely than more educated women to be in polygynous unions (supports H4). We then examine whether the effect of place of residence on the predicted probabilities of polygyny varies by birth cohort (Figure 5). In 16 countries, we find evidence to support H5 that selection of rural women into polygynous unions increases over time. Lastly, we test whether religion's association with polygyny varies by birth cohort (Figure 6). This part of the analysis focuses on a subset of 16 countries that meet the following two criteria: (1) comparable data collected on religion across all survey years; and (2) each religious category is represented by at least 10 percent of women in the sample. In most of these countries, the effect of religion on the likelihood of being in a polygynous union varies by birth cohort. Generally, we observe that Christian women experienced the most notable declines in predicted probabilities of being in a polygynous union over time, which implies greater selection of Muslim women and those belonging to other religions into polygynous unions (supports H6).

Discussion

Our study drew on multiple waves of data from 27 sub-Saharan African countries to examine trends in the prevalence of polygyny and investigate changes in selection into polygyny over time. It showed that polygyny continues to be prevalent across the subcontinent but is declining in almost all countries. Where polygyny has declined, the pace of this decline is strongly correlated with a country's level of development, as measured by the HDI: with few exceptions, countries with higher levels of development, and likely greater exposure to sociocultural, demographic, and economic change over the past several decades, have witnessed faster declines in polygyny over the study period.

Despite a differential decline in polygyny levels by union order between the earliest and latest surveys, polygyny levels have remained noticeably higher among previously married women. Our regression analyses confirmed this descriptive finding: Net of other factors, women in non-first unions have significantly higher odds of being in a polygynous union. Differences in the likelihood of polygyny could reflect differential marriage market conditions for never married versus previously married women. In contrast to never married women, previously married women who seek to remarry may have few options but to enter into a polygynous union. This explanation is confirmed by our finding that greater educational selectivity into polygynous unions exists for women in first unions, but not for those in non-first unions. As polygyny declines across sub-Saharan Africa, we found some evidence to support our hypothesis that, net of other factors, increasing selection of formerly

married women into polygynous unions is occurring. This selection appears to be largely driven by faster declines in the likelihood of polygyny among women in first unions. Where this decline is similar to marriage order, fewer formerly married women may be remarrying or more of them may be waiting longer to do so.

As polygyny declines, we show that the probability of being in a polygynous union has decreased for all subgroups of women. The speed and intensity of this decline, however, vary by subgroup, as well as by country. Most countries included in our study experienced increased selection into polygyny on one or more of the key sociodemographic characteristics that we considered—education, place of residence, and religion—and slightly more than half underwent growing selection on two or more of these characteristics. In these countries, we observed the greatest increases in negative selection into polygyny by education. This is not surprising given education's association with later age at first marriage and greater agency and empowerment. As their education levels rise, women may be more likely to desire and enter into a companionate union, which is oftentimes viewed as less compatible with polygyny. In contrast, only three countries in our sample did not experience increasing selection into polygyny by education, place of residence, or religion. Despite the lack of change, selection into polygyny still existed on most of these characteristics. Together these findings provide support for our hypotheses that, across many contexts, there is increasing selection of certain subgroups of women into polygynous unions, specifically the less educated, followers of Islam or non-Christian religions, and those living in rural areas, even after controlling for other sociodemographic, marital, and childbearing characteristics.

Our study has several limitations. At the country level, our descriptive portrait of polygyny decline from the 1990s to the 2010s covers, on average, a 20-year period. The regression analyses reflect an even shorter period, on average 16 years, because the DHS did not collect data on spouse's age in the early 1990s. Hence, the time period in our analyses may not be sufficiently long to fully detect compositional changes over time, including increasing selection into polygyny on key characteristics. Furthermore, the present study provides a snapshot of the prevalence of polygyny at specific moments in time. However, in sub-Saharan Africa, marriage is a fluid state, with many women entering and exiting monogamous and polygynous unions. For instance, a woman can enter into a monogamous marriage that later becomes polygynous if her husband marries another woman. Alternatively, a woman can marry into a polygynous union that later transforms into a monogamous union because the first wife divorces her husband or dies. Due to data limitations, we are unable to capture the lifetime prevalence of being in a polygynous union, which is likely higher than the one-time prevalence estimates observed in this study. Moreover, our measure of polygyny is based on self-reports of women knowing and reporting that their husband has another wife or lives with another woman as if married. In certain situations, a woman might be unaware that her husband has another wife, particularly if the couple lives in an urban area, where it might be possible to conceal such a union, or if her husband is engaged in labor migration and establishes a marital partnership at the place of his work. In addition, as bridewealth payment becomes less common and unions are increasingly informalized, there may be some uncertainty over the "status" of a husband's partner, that is, wife versus mistress. Such situations are, however, rare, as there is typically

little ambivalence to the social status of a partnership, and they should thus have minimal impact on reports of polygyny. Also, some women might be unwilling to admit in an interview that their husband has another wife. Though we acknowledge that our estimates of the prevalence of polygyny are likely underestimates, we do not expect underreporting to affect any underlying trends observed in the data. Finally, our study focused on whether increasing selection into polygyny is occurring on several sociodemographic characteristics that are easily observed and recorded in our data. It is quite possible that selection into polygyny also exists on unobserved characteristics and that this selection is increasing as polygyny declines across the subcontinent.

Despite these limitations, the present study provides a comprehensive and updated overview of the prevalence of polygyny, the characteristics associated with it, and how these characteristics are changing as polygyny becomes less common across sub-Saharan Africa. Similar to many developing contexts, this part of the world has experienced massive sociocultural, demographic, and economic changes over the past several decades that have transformed the institution of marriage, including that of polygyny. Altogether our findings demonstrate how the prevalence and characteristics associated with polygyny are changing and how these changes are occurring at different rates across the subcontinent. Much of this country-level variation likely stems from heterogeneity in lineage systems, marriage customs, legal tolerance of polygyny, urbanization levels, religion, and education levels. As sub-Saharan Africa continues to experience major and diverse societal transitions, the institution of marriage, including the practice of polygyny, will likely keep changing. The extent to which the prevalence of polygyny will continue to decline and whether the characteristics associated with it will change are difficult to predict. As the practice of marital payment also declines and marriage becomes increasingly informalized, polygyny may manifest itself in different forms, including informal multiple partnerships and non-coresidential unions. Though currently these types of unions may have less legitimate social status than formalized polygynous unions, in the future, they may be viewed as “functional equivalents of polygyny” (Whitehouse 2018) and contribute to the persistence of this form of marriage across the subcontinent.

Supplementary Material

Refer to Web version on PubMed Central for supplementary material.

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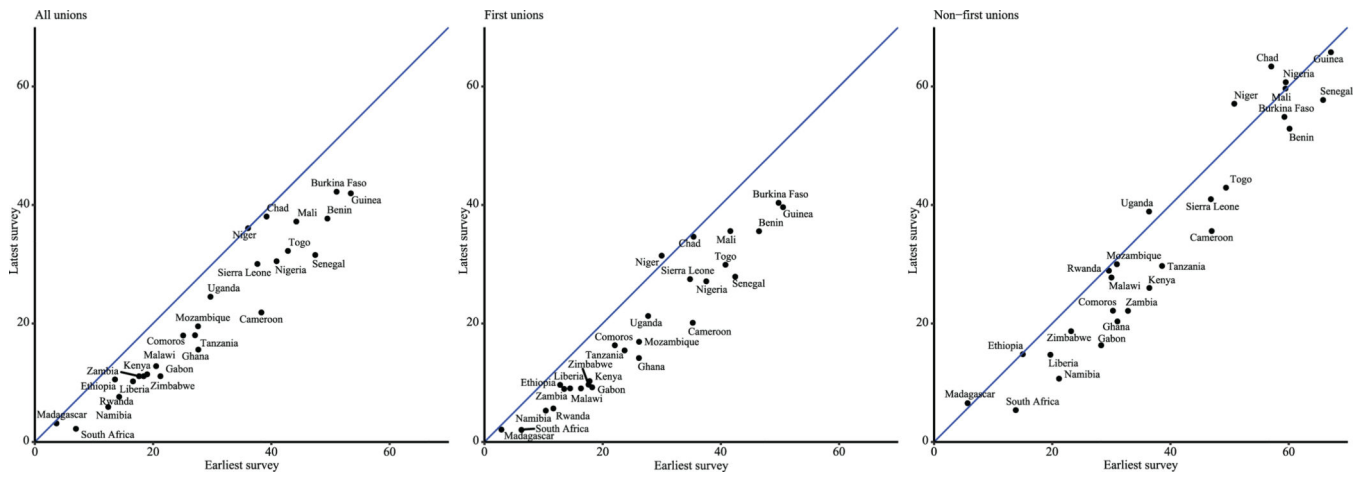


FIGURE 1.
Prevalence of polygyny among currently married women (percent)

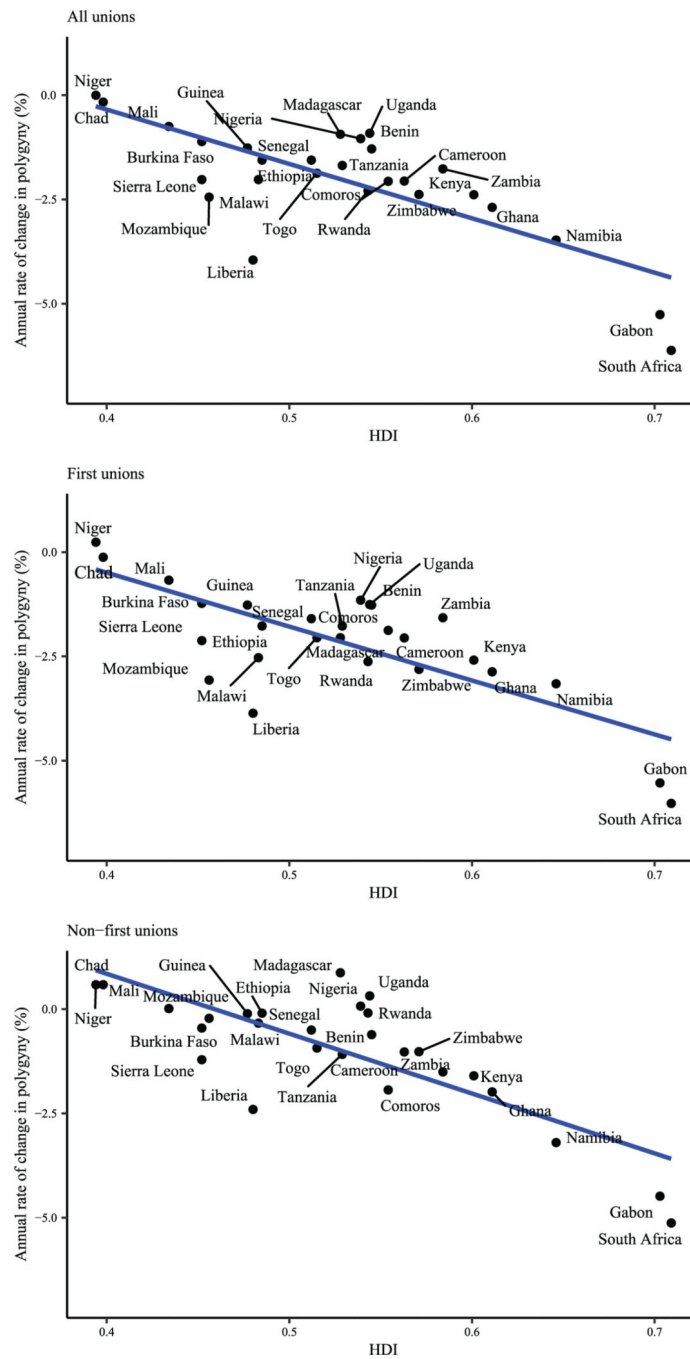


FIGURE 2. HDI and the annual rate of change in prevalence of polygyny (percent) between earliest and latest surveys

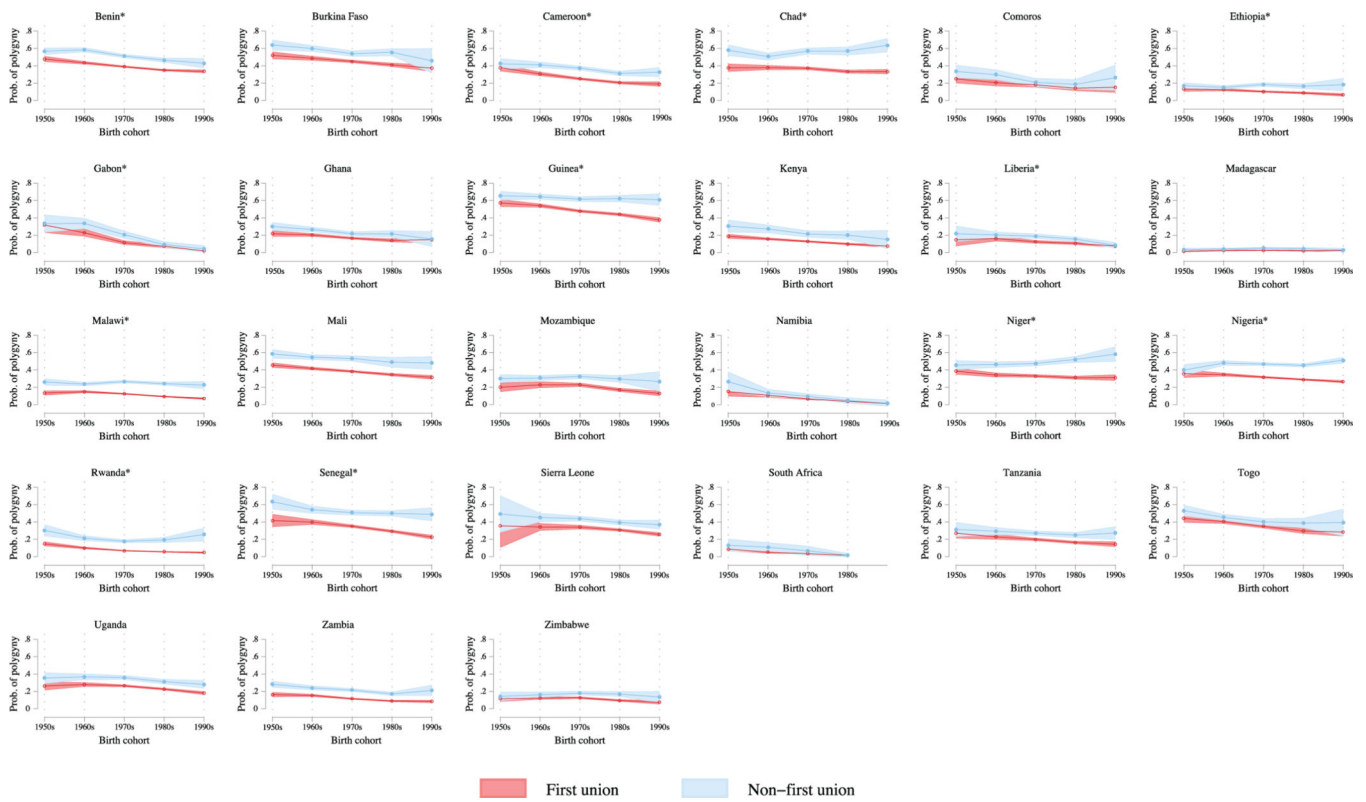


FIGURE 3. Predicted probabilities of a polygynous union by union order and birth cohort

* The association between union order and polygyny varies by birth cohort for one or more cohort–pair comparisons ($p < 0.05$).

NOTE: All models include the same controls indicated in Table 3. In South Africa, we could not obtain predicted probabilities for women born in the 1990s due to a lack of observations of previously married women in polygynous unions in the sample.

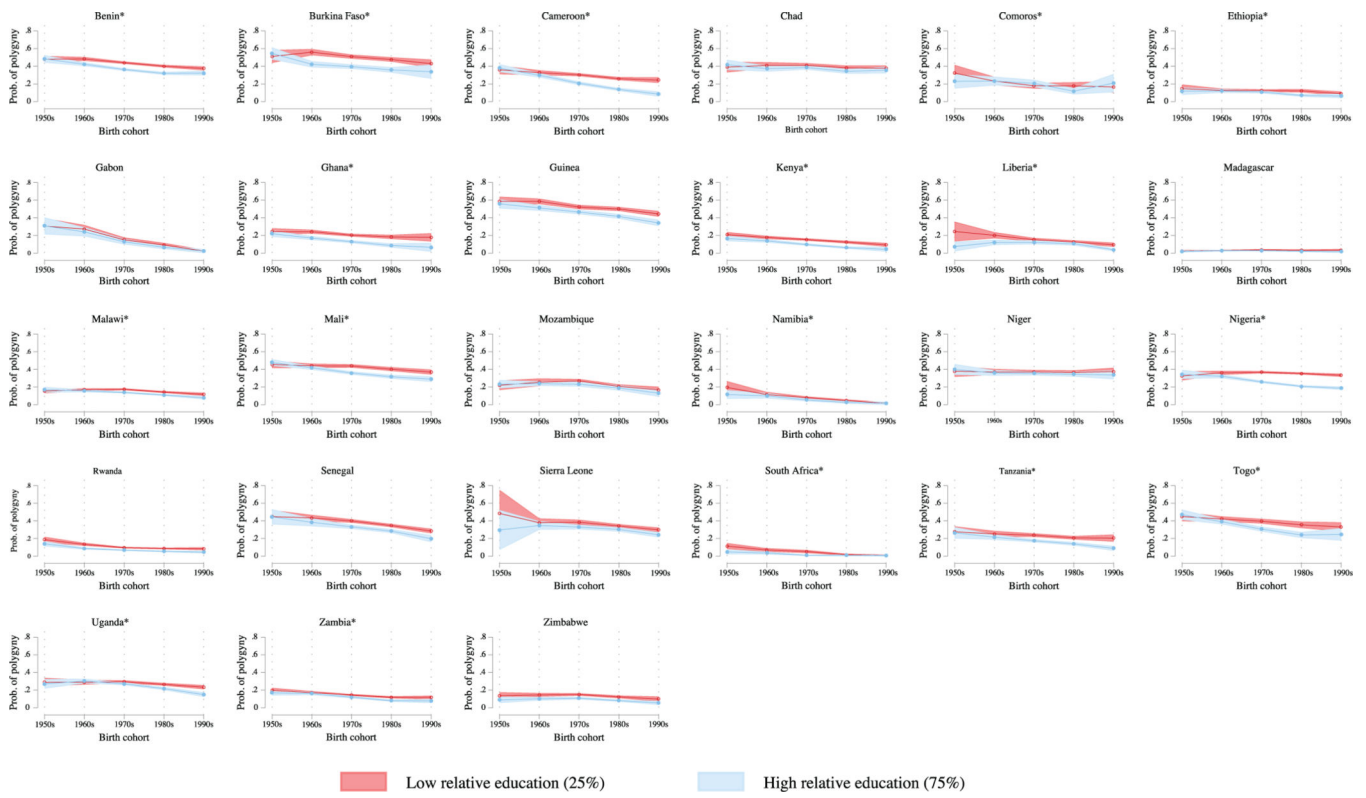


FIGURE 4. Predicted probabilities of a polygynous union by education and birth cohort

* The association between union order and polygyny varies by birth cohort for one or more cohort–pair comparisons ($p < 0.05$).

NOTE: All models include the same controls indicated in Table 3.

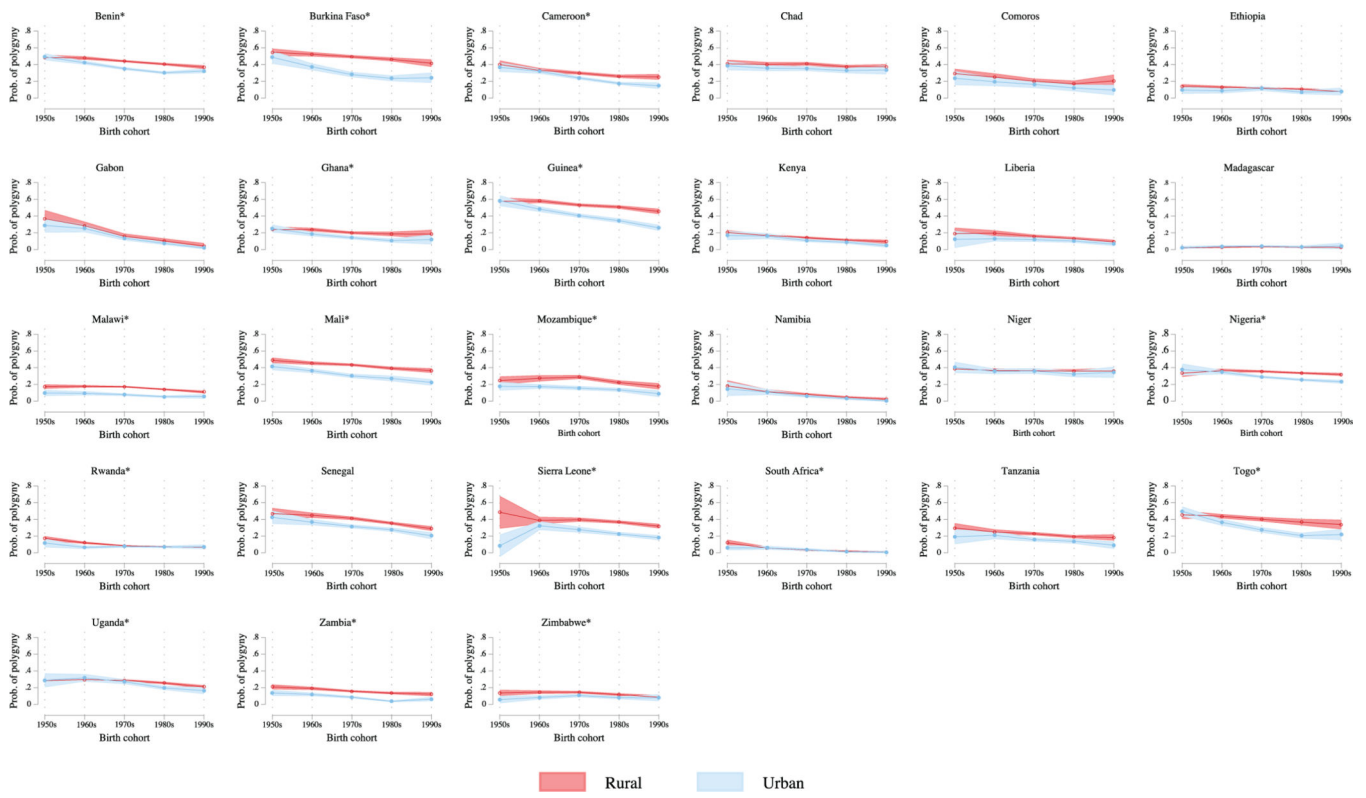


FIGURE 5. Predicted probabilities of a polygynous union by place of residence and birth cohort

* The association between union order and polygyny varies by birth cohort for one or more cohort–pair comparisons ($p < 0.05$).

NOTE: All models include the same controls indicated in Table 3.

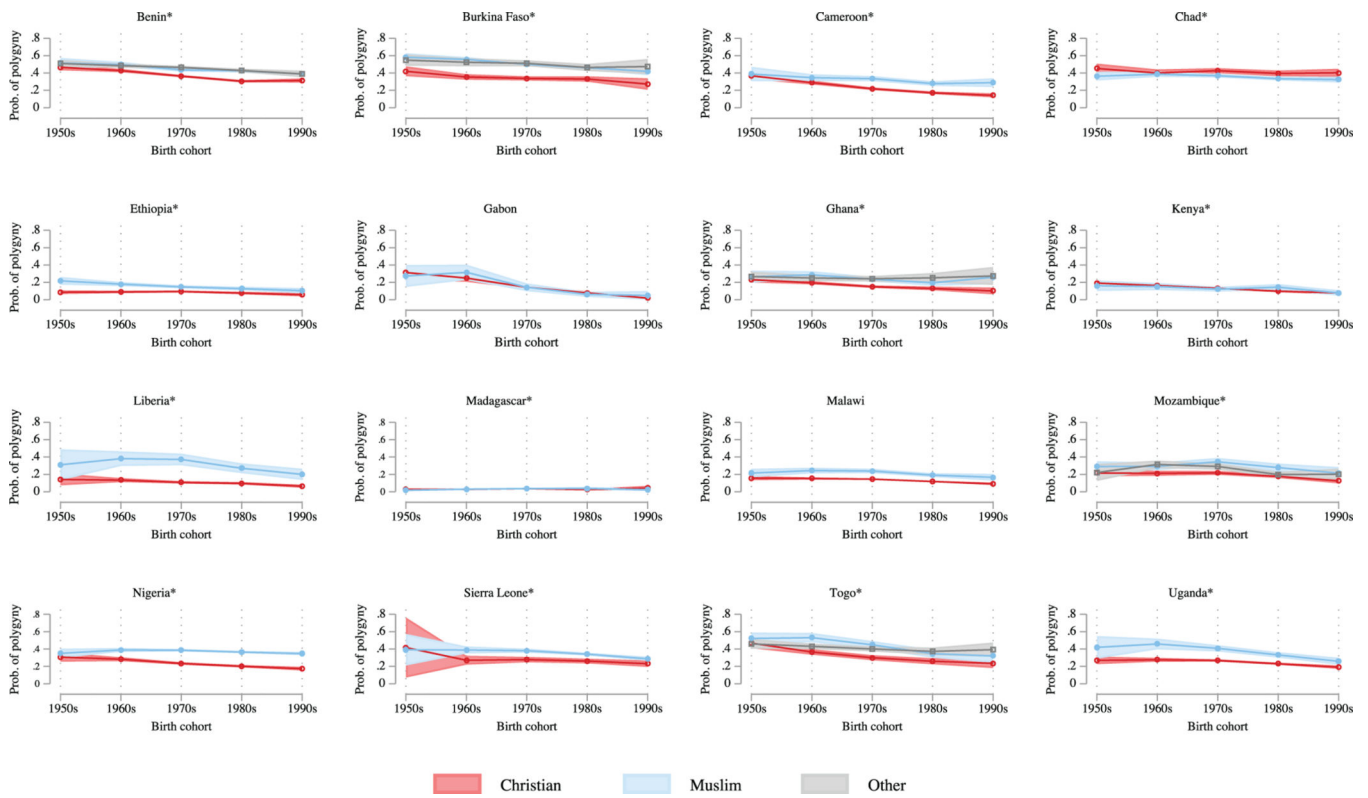


FIGURE 6. Predicted probabilities of a polygynous union by religion and birth cohort
 * The association between union order and polygyny varies by birth cohort for one or more cohort–pair comparisons ($p < 0.05$).
 NOTE: All models include the same controls indicated in Table 3.

TABLE 1

Country and survey years, Demographic and Health Surveys

Country	Years	Number of women in analytic sample
Benin	1996, 2001, 2006, 2011–2012, 2017–2018	45,387
Burkina Faso	1993 ^a , 1998–1999, 2003, 2010	33,059
Cameroon	1991 ^a , 1998, 2004, 2011, 2018	30,712
Chad	1996–1997, 2004, 2014–2015	23,585
Comoros	1996, 2012	4,925
Ethiopia	2000, 2005, 2011, 2016	38,052
Gabon	2000, 2012	8,218
Ghana	1993 ^a , 1998, 2003, 2008, 2014	18,533
Guinea	1999, 2005, 2012, 2018	26,449
Kenya	1993 ^a , 1998, 2003, 2008–2009, 2014	38,383
Liberia	2007, 2013, 2019–2020	15,037
Madagascar	1992 ^a , 1997, 2003–2004, 2008–2009	24,829
Malawi	1992 ^a , 2000, 2004, 2010, 2015–2016	52,632
Mali	1995–1996, 2001, 2006, 2012–2013, 2018	48,155
Mozambique	1997, 2003, 2011	23,593
Namibia	1992 ^a , 2000, 2006–2007, 2013	12,065
Niger	1992 ^a , 1998, 2006, 2012	28,290
Nigeria	1990 ^a , 2003, 2008, 2013, 2018	91,969
Rwanda	1992 ^a , 2000, 2005, 2010, 2014–2015, 2019–2020	35,061
Senegal ^b	1992–1993 ^a , 2005, 2010–2011, 2014, 2018	37,676
Sierra Leone	2008, 2013, 2019	25,964
South Africa	1998, 2016	7,789
Tanzania	1991–1992 ^a , 1996 ^a , 2004–2005, 2010, 2015–2016	32,780
Togo	1998, 2013–2014	12,336
Uganda	1995 ^a , 2000–2001, 2006, 2011, 2016	31,671
Zambia	1992 ^a , 1996, 2001–2002, 2007, 2013–2014, 2018	35,709
Zimbabwe	1994 ^a , 1999, 2005–2006, 2010–2011, 2015	24,041

^aSurvey did not collect information on spouse's age.

^bFrom 2012 to 2018, the DHS administered Continuous surveys on an annual basis. To prevent later surveys from weighting more heavily in analyses than earlier surveys, we only included the surveys conducted in 2014 and 2018.

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TABLE 2

Prevalence of polygyny among currently married women in the earliest and latest surveys, Demographic and Health Surveys

Country	Earliest Year	Latest Year	All unions						First unions						Non-first unions					
			Earliest (%)	Latest (%)	Change (%)	Annual rate of change (%)	Earliest (%)	Latest (%)	Change (%)	Annual rate of change (%)	Earliest (%)	Latest (%)	Change (%)	Annual rate of change (%)	Earliest (%)	Latest (%)	Change (%)	Annual rate of change (%)		
Benin	1996	2017-18	49.5	37.7	-23.8	-1.3***	46.5	35.6	-23.4	-1.3***	60.1	52.9	-12.1	-0.6**						
Burkina Faso	1993	2010	51.1	42.2	-17.3	-1.1***	49.8	40.3	-18.9	-1.2***	59.3	54.9	-7.4	-0.5						
Cameroon	1991	2018	38.3	21.9	-42.9	-2.1***	35.2	20.1	-42.9	-2.1***	47.0	35.6	-24.2	-1.0**						
Chad	1996-97	2014-15	39.2	38.0	-2.9	-0.2	35.4	34.6	-2.1	-0.1	57.1	63.4	11.1	0.6*						
Comoros	1996	2012	25.1	18.0	-28.4	-2.1***	22.1	16.3	-26.1	-1.9***	30.3	22.2	-26.8	-1.9**						
Ethiopia	2000	2016	13.5	10.5	-22.2	-1.6**	12.8	9.6	-24.8	-1.8**	15.0	14.8	-1.5	-0.1						
Gabon	2000	2012	21.2	11.1	-47.7	-5.3***	18.2	9.2	-49.5	5.5***	28.3	16.3	-42.4	-4.5***						
Ghana	1993	2014	27.6	15.6	-43.6	-2.7***	26.1	14.2	-45.7	-2.9***	31.0	20.4	-34.4	-2.0***						
Guinea	1999	2018	53.4	41.9	-21.5	-1.3***	50.5	39.6	-21.6	-1.3***	67.1	65.8	-2.0	-0.1						
Kenya	1993	2014	19.0	11.4	-39.8	-2.4***	17.8	10.3	-42.4	-2.6***	36.4	26.0	-28.6	-1.6**						
Liberia	2007	2019-20	16.6	10.2	-38.3	-3.9***	14.5	9.0	-37.7	-3.9***	19.7	14.7	-25.3	-2.4*						
Madagascar	1992	2008-09	3.7	3.1	-14.0	-0.9	2.9	2.1	-28.2	-2.1	5.7	6.5	14.9	0.9						
Malawi	1992	2015-16	20.5	12.8	-37.6	-2.0***	16.3	9.1	-44.6	-2.5***	30.0	27.8	-7.5	-0.3						
Mali	1995-96	2018	44.2	37.2	-15.9	-0.7***	41.6	35.6	-14.4	-0.7***	59.4	59.6	0.3	0.0						
Mozambique	1997	2011	27.6	19.5	-29.3	-2.4**	26.2	16.9	-35.3	-3.1**	30.9	30.0	-3.0	-0.2						
Namibia	1992	2013	12.4	5.9	-52.4	-3.5***	10.4	5.3	-49.0	-3.2***	21.2	10.7	-49.5	-3.2***						
Niger	1992	2012	36.1	36.1	0.0	0.0	30.0	31.4	4.9	0.2	50.8	57.1	12.4	0.6**						
Nigeria	1990	2018	40.9	30.5	-25.4	-1.0***	37.5	27.1	-27.7	-1.2***	59.5	60.7	2.1	0.1						
Rwanda	1992	2019-20	14.3	7.6	-46.6	-2.3***	11.7	5.7	-51.2	-2.6***	29.6	28.9	-2.3	-0.1						
Senegal	1992-93	2018	47.4	31.6	-33.4	-1.6***	42.4	27.9	-34.2	-1.6***	65.8	57.7	-12.3	-0.5**						
Sierra Leone	2008	2019	37.7	30.1	-20.2	-2.0***	34.8	27.5	-21.0	-2.1***	46.8	41.0	-12.6	-1.2*						
South Africa	1998	2016	7.0	2.2	-67.9	-6.1***	6.3	2.1	-67.3	-6.0***	13.8	5.4	-61.2	-5.1*						

Country	Earliest Year	Latest Year	All unions						Non-first unions					
			Earliest (%)	Latest (%)	Change (%)	Annual rate of change (%)	Earliest (%)	Latest (%)	Change (%)	Annual rate of change (%)	Earliest (%)	Latest (%)	Change (%)	Annual rate of change (%)
Tanzania	1991-92	2015-16	27.1	18.0	-33.6	-1.7***	23.7	15.4	-34.9	-1.8***	38.6	29.7	-23.0	-1.1***
Togo	1998	2013-14	42.8	32.3	-24.7	-1.9***	40.8	29.9	-26.7	-2.0***	49.4	42.9	-13.2	-0.9**
Uganda	1995	2016	29.7	24.5	-17.5	-0.9***	27.7	21.2	-23.3	-1.3***	36.4	38.9	6.8	0.3
Zambia	1992	2018	17.6	11.1	-37.1	-1.8***	13.5	8.9	-33.8	-1.6***	32.8	22.1	-32.6	-1.5***
Zimbabwe	1994	2015	18.4	11.1	-39.7	-2.4***	17.6	9.7	-45.0	-2.8***	23.2	18.7	-19.4	-1.0

 $p < 0.001$

**
 $p < 0.01$

*
 $p < 0.05$.

NOTE: Significance levels denote whether the difference in the prevalence of polygyny between the earliest and latest surveys is statistically significant.

TABLE 3

Odds ratios of being in a polygynous union, Demographic and Health Surveys

	Benin	Burkina Faso	Cameroon ^a	Chad ^b	Comoros ^a	Ethiopia	Gabon	Ghana	Guinea	Kenya	Liberia ^a	Madagascar ^a	Malawi	Mali
Birth cohort														
1950s	1.42*** (0.09)	2.45*** (0.16)	1.82*** (0.19)	1.03 (0.10)	1.67*** (0.26)	1.19 (0.17)	2.93*** (0.80)	1.54*** (0.17)	1.44*** (0.13)	2.72*** (0.19)	1.25 (0.32)	0.63 (0.18)	1.03 (0.10)	2.37*** (0.09)
1960s	1.26*** (0.05)	1.22** (0.08)	1.35*** (0.08)	0.97 (0.06)	1.32 (0.19)	1.08 (0.09)	2.25*** (0.39)	1.34*** (0.10)	1.30*** (0.06)	2.34*** (0.11)	1.27* (0.13)	0.84 (0.14)	1.05 (0.06)	1.15*** (0.05)
1970s (ref.)	—	—	—	—	—	—	—	—	—	—	—	—	—	—
1980s	0.83*** (0.03)	0.84** (0.05)	0.73*** (0.04)	0.85** (0.05)	0.78 (0.13)	0.81* (0.07)	0.52*** (0.07)	0.84* (0.07)	0.86*** (0.04)	0.74*** (0.06)	0.80* (0.08)	0.81 (0.14)	0.76*** (0.04)	0.83 (0.04)
1990s	0.77*** (0.04)	0.69*** (0.08)	0.67*** (0.07)	0.86 (0.07)	0.91 (0.22)	0.60*** (0.09)	0.14*** (0.04)	0.85 (0.15)	0.64*** (0.05)	0.53*** (0.08)	0.51*** (0.09)	0.80 (0.23)	0.58*** (0.05)	0.72*** (0.04)
Relative education score	0.99*** (0.00)	0.99*** (0.00)	0.99*** (0.00)	1.00* (0.00)	1.00 (0.00)	0.99*** (0.00)	1.00 (0.00)	0.99*** (0.00)	0.99*** (0.00)	0.99*** (0.00)	0.99*** (0.00)	1.00* (0.00)	0.99*** (0.00)	0.99*** (0.00)
Urban residence	0.69*** (0.02)	0.39*** (0.03)	0.66*** (0.04)	0.80*** (0.05)	0.70*** (0.07)	0.75* (0.09)	0.77** (0.08)	0.65*** (0.05)	0.54*** (0.03)	0.75*** (0.06)	0.69*** (0.06)	1.24 (0.16)	0.39*** (0.03)	0.57*** (0.03)
Religion														
Christian (ref.)	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Muslim	1.50*** (0.06)	2.28*** (0.12)	1.87*** (0.14)	0.78*** (0.05)	2.16*** (0.19)	2.16*** (0.19)	1.46 (0.30)	2.77*** (0.15)	1.69*** (0.20)	1.12 (0.15)	4.46*** (0.53)	2.53 (1.42)	2.92*** (0.13)	2.04*** (0.21)
Other	1.54*** (0.05)	2.22*** (0.17)	2.16*** (0.17)	1.39** (0.15)	1.92*** (0.27)	1.92*** (0.27)	1.08 (0.15)	1.74*** (0.14)	1.18 (0.17)	1.89*** (0.30)	1.37 (0.25)	1.06 (0.12)	1.85*** (0.21)	2.22*** (0.26)
Previously married	1.74*** (0.05)	1.74*** (0.09)	1.90*** (0.08)	2.36*** (0.12)	1.46*** (0.14)	1.81*** (0.12)	1.69*** (0.17)	1.55*** (0.09)	1.94*** (0.09)	2.26*** (0.20)	1.57*** (0.11)	1.97*** (0.21)	2.64*** (0.10)	1.89*** (0.07)
Constant	0.38*** (0.03)	0.25*** (0.04)	0.22*** (0.03)	0.24*** (0.03)	0.05*** (0.02)	0.05*** (0.01)	0.24*** (0.07)	0.08*** (0.02)	0.24*** (0.04)	0.09*** (0.02)	0.07*** (0.02)	0.01*** (0.00)	0.08*** (0.01)	0.15*** (0.02)
N(women)	44,127	26,655	26,889	22,577	4,596	37,619	7,239	15,056	25,499	23,310	14,346	20,743	48,693	46,229

	Mozambique ^a	Namibia	Niger ^d	Nigeria	Rwanda ^b	Senegal	Sierra Leone	South Africa	Tanzania ^a	Togo	Uganda ^d	Zambia ^d	Zimbabwe ^d
Birth cohort													
1950s	0.85 (0.11)	2.88*** (0.69)	1.14 (0.10)	1.05 (0.12)	2.31*** (0.14)	1.48** (0.20)	1.19 (0.47)	2.70*** (0.59)	1.45** (0.22)	1.61*** (0.17)	0.99 (0.11)	1.53*** (0.14)	0.86 (0.13)
1960s	0.97 (0.08)	1.68*** (0.26)	1.01 (0.06)	1.15** (0.05)	1.43*** (0.10)	1.23** (0.08)	1.03 (0.08)	1.60* (0.36)	1.19 (0.11)	1.29*** (0.09)	1.07 (0.06)	1.33*** (0.08)	0.95 (0.08)
1970s (ref.)	—	—	—	—	—	—	—	—	—	—	—	—	—
1980s	0.71*** (0.05)	0.53*** (0.10)	0.96 (0.05)	0.87*** (0.03)	0.85*** (0.05)	0.77*** (0.04)	0.84** (0.05)	0.39** (0.13)	0.80** (0.06)	0.78** (0.07)	0.80*** (0.04)	0.73*** (0.04)	0.76*** (0.06)
1990s	0.50*** (0.07)	0.19*** (0.07)	0.98 (0.09)	0.78*** (0.04)	0.79* (0.09)	0.53*** (0.05)	0.65*** (0.06)	0.22* (0.14)	0.71* (0.10)	0.73* (0.09)	0.61*** (0.05)	0.72** (0.08)	0.56*** (0.09)
Relative education score	1.00*** (0.00)	0.99*** (0.00)	1.00 (0.00)	0.99*** (0.00)	0.99*** (0.00)	0.99*** (0.00)	1.00*** (0.00)	0.98*** (0.00)	0.99*** (0.00)	0.99*** (0.00)	1.00*** (0.00)	0.99*** (0.00)	0.99*** (0.00)
Urban residence	0.49*** (0.04)	0.77* (0.10)	0.94 (0.07)	0.68*** (0.03)	0.83** (0.06)	0.65*** (0.03)	0.51*** (0.03)	0.79 (0.13)	0.63*** (0.06)	0.60*** (0.04)	0.83*** (0.05)	0.42*** (0.03)	0.64*** (0.06)
Religion													
Christian (ref.)	—	—	—	—	—	—	—	—	—	—	—	—	—
Muslim	1.84*** (0.15)	—	—	2.38*** (0.11)	3.30*** (0.50)	1.57*** (0.10)	—	—	—	1.77*** (0.15)	1.88*** (0.10)	2.46** (0.70)	0.51 (0.24)
Other	1.48*** (0.09)	2.00** (0.46)	—	2.25*** (0.29)	3.40*** (0.98)	1.74* (0.40)	—	—	—	1.50*** (0.10)	1.24+ (0.16)	2.33*** (0.39)	1.12 (0.10)
Previously married	1.76*** (0.11)	1.50** (0.20)	2.03*** (0.09)	2.34*** (0.08)	3.18*** (0.18)	2.30*** (0.11)	1.60*** (0.08)	1.91** (0.41)	1.61*** (0.08)	1.35*** (0.08)	1.61*** (0.07)	2.17*** (0.10)	1.64*** (0.12)
Constant	0.13*** (0.02)	0.02*** (0.01)	0.12*** (0.01)	0.14*** (0.03)	0.07*** (0.02)	0.07*** (0.01)	0.22*** (0.04)	0.09** (0.07)	0.13*** (0.03)	0.24*** (0.04)	0.14*** (0.02)	0.09*** (0.02)	0.19*** (0.04)
N (women)	22,804	9,115	22,516	81,843	30,985	32,356	23,079	7,191	21,139	12,037	26,555	30,102	20,146

p < 0.001
**
p < 0.01
*
p < 0.05.

NOTE: All models control for age, ethnicity, spousal age difference, spousal education difference, and premarital birth history unless otherwise specified. Standard errors in parentheses.

Model does not control for ethnicity due to a lack of comparable data across survey waves. Instead, model controls for the region.

Model does not control for ethnicity due to lack of comparable data across survey waves.

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TABLE 4

Sociodemographic characteristics of study sample, Demographic and Health Surveys

	Benin				Burkina Faso				Cameroon				Chad				Comoros				
	Earliest		Latest		Earliest		Latest		Earliest		Latest		Earliest		Latest		Earliest		Latest		
	Mono	Poly	Mono	Poly	Mono	Poly	Mono	Poly	Mono	Poly	Mono	Poly	Mono	Poly	Mono	Poly	Mono	Poly	Mono	Poly	
Relative education score	49.0	45.7	48.8	43.9	43.9	51.3	46.2	49.8	43.7	50.8	39.6	49.4	26.4	48.9	48.9	48.3	47.3	47.9	45.5	47.6	44.6
Urban residence (%)	37.7	31.7	43.1	34.0	24.4	10.4	29.0	10.5	42.6	31.2	53.5	28.1	22.1	19.9	20.8	18.0	26.8	19.8	34.1	26.0	
Religion (%)																					
Christian	48.4	34.9	56.1	41.2	33.2	21.0	32.9	18.8	70.0	46.8	73.3	34.8	37.4	42.3	43.3	40.7	na	na	na	na	na
Muslim	20.2	24.2	29.4	38.6	54.9	57.2	60.2	69.3	20.4	32.4	23.5	56.5	57.8	49.4	54.1	54.4	na	na	na	na	na
Other	31.5	40.9	14.5	20.2	11.9	21.8	6.9	11.9	9.7	20.8	3.2	8.7	4.8	8.3	2.7	4.9	na	na	na	na	na
	Ethiopia				Gabon				Ghana				Guinea				Kenya				
	Earliest		Latest		Earliest		Latest		Earliest		Latest		Earliest		Latest		Earliest		Latest		
	Mono	Poly	Mono	Poly	Mono	Poly	Mono	Poly	Mono	Poly	Mono	Poly	Mono	Poly	Mono	Poly	Mono	Poly	Mono	Poly	
Relative education score	47.9	46.5	47.1	41.8	48.1	44.3	47.9	43.4	49.0	42.2	48.3	31.7	48.8	47.1	48.8	44.5	49.5	40.7	49.0	33.3	
Urban residence (%)	13.1	6.1	17.2	8.1	77.8	70.4	86.9	86.2	34.8	24.6	52.9	34.5	31.2	23.3	38.3	19.0	16.1	10.6	41.4	24.6	
Religion (%)																					
Christian	69.7	46.4	65.9	44.6	81.3	79.6	85.4	77.3	71.0	55.4	81.2	54.1	12.1	5.3	14.0	5.9	91.8	84.3	92.3	81.3	
Muslim	27.2	46.9	32.6	51.7	7.8	8.8	9.1	18.6	11.5	18.2	14.4	32.0	80.9	89.6	83.8	93.4	4.5	7.2	5.8	14.4	
Other	3.2	6.7	1.5	3.7	10.9	11.6	5.6	4.1	17.5	26.4	4.4	13.9	7.0	5.1	2.2	0.7	3.7	8.5	1.9	4.3	
	Liberia				Madagascar				Malawi				Mali				Mozambique				
	Earliest		Latest		Earliest		Latest		Earliest		Latest		Earliest		Latest		Earliest		Latest		
	Mono	Poly	Mono	Poly	Mono	Poly	Mono	Poly	Mono	Poly	Mono	Poly	Mono	Poly	Mono	Poly	Mono	Poly	Mono	Poly	
Relative education score	48.2	38.9	46.1	36.5	49.0	41.7	49.0	40.1	48.6	47.2	49.0	41.5	48.9	47.4	49.0	45.5	49.2	45.0	47.7	43.6	
Urban residence (%)	37.0	19.1	55.3	40.4	17.0	14.5	15.8	14.3	13.1	6.7	17.6	6.4	30.4	21.6	26.3	16.0	22.3	12.1	32.3	17.9	
Religion (%)																					
Christian	86.0	70.0	85.0	61.8	76.8	64.9	70.5	55.0	85.8	78.7	87.3	79.3	4.0	1.3	3.5	1.1	56.9	42.6	70.8	64.8	

	Benin			Burkina Faso			Cameroon			Chad			Comoros							
	Earliest		Latest	Earliest		Latest	Earliest		Latest	Earliest		Latest	Earliest		Latest					
	Mono	Poly	Mono	Poly	Mono	Poly	Mono	Poly	Mono	Poly	Mono	Poly	Mono	Poly	Mono	Poly				
Muslim	9.9	23.2	13.3	36.4	0.9	0.8	0.7	0.5	12.8	17.8	12.1	19.1	89.2	92.0	93.4	94.7	19.3	18.5	18.9	18.6
Other	4.1	6.9	1.8	1.8	22.3	34.3	28.8	44.5	1.5	3.5	0.6	1.6	6.7	6.7	3.2	4.1	23.9	38.9	10.4	16.6
	Namibia			Niger			Nigeria			Rwanda			Senegal							
	Earliest		Latest	Earliest		Latest	Earliest		Latest	Earliest		Latest	Earliest		Latest					
	Mono	Poly	Mono	Poly	Mono	Poly	Mono	Poly	Mono	Poly	Mono	Poly	Mono	Poly	Mono	Poly				
Relative education score	49.5	39.1	48.9	37.4	48.4	49.6	48.5	47.4	49.0	41.7	51.0	31.9	48.7	44.4	49.7	41.4	47.2	44.2	46.6	40.3
Urban residence (%)	41.3	21.4	59.5	36.9	13.3	15.9	16.0	12.5	24.1	17.6	45.9	28.2	5.4	3.0	17.6	14.6	36.6	27.3	45.5	31.0
Religion (%)																				
Christian	97.7	98.0	87.4	84.7	na	na	na	na	46.5	29.6	50.2	15.9	na	na	na	na	4.9	1.6	3.2	0.3
Muslim	na	na	na	na	na	na	na	na	48.9	64.8	49.2	83.8	na	na	na	na	95.0	98.4	96.8	99.6
Other	2.3	2.0	12.7	15.3	na	na	na	na	4.6	5.6	0.6	0.3	na	na	na	na	0.1	0.0	0.0	0.0
	Sierra Leone			South Africa			Tanzania			Togo			Uganda							
	Earliest		Latest	Earliest		Latest	Earliest		Latest	Earliest		Latest	Earliest		Latest					
	Mono	Poly	Mono	Poly	Mono	Poly	Mono	Poly	Mono	Poly	Mono	Poly	Mono	Poly	Mono	Poly				
Relative education score	47.9	42.4	47.5	42.1	50.3	30.0	50.3	38.7	49.3	43.6	48.6	38.6	48.4	43.5	50.1	39.1	47.3	47.8	48.9	44.3
Urban residence (%)	33.2	20.2	42.1	24.5	61.5	38.8	74.5	52.8	23.6	16.9	33.5	18.7	34.6	23.6	44.7	26.6	12.3	10.9	24.9	19.4
Religion (%)																				
Christian	23.1	10.5	22.9	13.6	na	na	na	na	na	na	na	na	50.8	34.6	62.2	40.9	86.7	82.5	87.5	80.4
Muslim	76.0	88.2	77.1	86.3	na	na	na	na	na	na	na	na	9.7	13.7	15.9	21.9	10.3	16.1	11.5	18.4
Other	0.9	1.2	0.0	0.0	na	na	na	na	na	na	na	na	39.5	51.8	21.9	37.2	3.0	1.5	1.0	1.3
	Zambia			Zimbabwe																
	Earliest		Latest	Earliest		Latest														
	Mono	Poly	Mono	Poly	Mono	Poly														
Relative education score	48.4	42.1	46.9	37.5	50.0	39.2	49.1	37.4												

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	Zambia						Zimbabwe					
	Earliest			Latest			Earliest			Latest		
	Mono	Poly		Mono	Poly		Mono	Poly		Mono	Poly	
Urban residence (%)	51.7	24.4	43.4	15.6	31.5	19.3	35.9	19.7				
Religion (%)												
Christian	97.1	94.0	98.1	97.5	57.0	39.2	93.2	93.7				
Muslim	0.4	0.4	0.5	1.5	na	na	0.4	0.0				
Other	2.6	5.6	1.4	1.0	43.1	60.8	6.4	6.3				

NOTE: na = not applicable. Relative education scores range from 0 to 100. Higher scores indicate higher levels of education.