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Changing Gender Gaps in the Timing of Partnership Formation in Sub-Saharan Africa

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Keywords

gender gaps, partnership formation, Sub-Saharan Africa

Disciplines

Demography, Population, and Ecology | Family, Life Course, and Society | Gender and Sexuality | Social and Behavioral Sciences | Sociology

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Abstract

Due to scarcity of research about men, gender differences in transition to adulthood in Sub-Saharan Africa remain poorly documented. We adopt a novel perspective on this topic by examining *gender gaps* in the ages of first union and sex in 27 countries, focusing on measures of central tendency and dispersion. Gender differences in the age of first union decreased, driven by postponement among women with relatively late pattern of union formation. Due to concurrent persistence of very early unions among a sizable portion of women's populations, within-country heterogeneity in the ages of first union increased substantially among women. Hence, although forces responsible for earlier union formation among women than among men are weakening, these changes affect population strata unequally. Gender differences in the age of first sex decreased to a lesser extent, but in some countries, they disappeared or reversed, suggesting a shift in the relationship between gender and timing of sexual initiation. Changes in partnership formation are more heterogeneous across countries among men than among women, indicating that timing of transition to adulthood among men is more context specific. We show importance of including men in research on partnership formation and exploring heterogeneity in this process both within and between populations of women and men.

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1. Introduction

Sexual initiation and union formation are among the key events marking transition to adulthood. Although partnership formation is a process involving both women and man, comprehensive research examining levels and trends in the ages of sexual initiation and first union formation in Sub-Saharan African countries has so far mainly focused on women (e.g. Mensch, Grant, and Blanc 2006). Such one-sided perspectives omit a crucial dimension of partnership formation dynamic: the behavior of men. The scarcity of research on the topic is because, until recently, the information about the ages of first union and first sex has not been widely collected among men as part of demographic surveys in low- and middle-income countries (LMICs). As a result, the knowledge about the magnitude of gender differences in the timing of transition to adulthood, as well as their changes in the last decades in Sub-Saharan African countries remains inadequate.

Examining gender gaps in the timing of union formation and sexual initiation is important to enhance the understanding of family and gender relations (Malhotra 1997; Mensch, Singh, and Casterline 2005). As highlighted by van de Walle and Meekers (1994), marriage is a process which helps to understand better the organization of the whole social system. This is particularly relevant in Sub-Saharan Africa, where levels of gender inequality one of the highest in the world (UNDP 2019) and where, traditionally, families have been characterized by patriarchy and authority of their senior members (Airhihenbuwa 1995). Moreover, early transition to adulthood and high levels of child marriage among women continue to be prevalent in the region (Koski, Clark, and Nandi 2017), and are one of the ways through which women's low level of empowerment is manifested. Such early transition to adulthood can have implications for women's opportunities in wide range of domains and the balance of power within the households they form. The study of the magnitude and the evolution of gender gaps in the timing of partnership formation can cast light on whether there are signs of changes in the way marriage systems are organized, which is crucial for understanding of social and family change in the region.

The study of gender gaps in the timing of partnership formation is relevant in the context of vast changes that occurred in Sub-Saharan Africa. Last decades have seen pronounced social and economic transformations which included urbanization, westernization, increasing exposure to mass media, increasing women's employment and education (ECA 2017; Majgaard and Mingat 2012). Such modernization and developmental processes can be associated with emergence of more egalitarian gender relations, and changes in the patterns of family formation (Caldwell 1982; Goode 1963). As an expression of growing egalitarianism, and through their impact on the life-courses of young people,

these changes could result in increasingly similar partnerships formation trajectories among men and women. Without empirically examining this proposition, Pesando and GFC-team (2019) suggested that development might be associated with diminishing differences in transition to adulthood between men and women in LMICs. Given these considerations, the lack of comprehensive research examining gender gaps in the timing of union formation and sexual initiation in LMICs is an important gap in knowledge.

In this paper, we study gender gaps in partnership formation in Sub-Saharan African countries. We examine how the ages of first union and first sex differ between men and women, and whether gender differences in the timing of partnership formation decreased in the last decades as fertility declined in most countries, schooling expanded, and societies became more developed. Moreover, we examine the extent to which the changes in gender gaps result primarily from the shifts in the behavior of men, from changes in the behavior of women, or both.

Our analyses are based on *all* the available Demographic and Health Surveys (DHS) that include men's questionnaires. These DHS data on men have remained largely unexploited for the large-scale, cross-country comparative studies of partnership formation in Sub-Saharan Africa. Using 97 surveys for 27 countries and information about the ages of first union and first sex for both men and women, we create indicators of gender gaps in the timing of partnership formation for cohorts born between 1960s and 1990s.

An important additional contribution of our study is that we move beyond the conventional measures such as the median or the mean ages at first union and first sex. We calculate ages at which 25% (25th percentile), 50% (median) and 75% (75th percentile) of women and men in each cohort experience first sex and union, as well as corresponding interquartile ranges. This allows us to examine the timing of partnership formation in a comprehensive manner, by looking at the whole distributions of the ages at first union and first sex. This approach permits examining gender differences in the dispersion of these distributions, which is important for understanding of the variation and diversity in the timing of union formation and sexual initiation both between genders and within the populations of men and women. Our aim is to provide the first detailed account of the magnitude of gender gaps in the ages of first union and first sex, as well as their changes over time, in Sub-Saharan African countries.

2. Gender differences in the timing of partnership formation in Sub-Saharan Africa

Current evidence

Few studies have provided empirical evidence about how the ages at partnership formation differ between men and women in Sub-Saharan Africa. By aggregating information from available censuses, Lloyd (2005) and Mensch, Singh, and Casterline (2005) examined gender differences in the prevalence of marriage across age groups, finding that the percentage of men who were less than 30 years old and married was lower than among women. Between the 1970s and 2000s, these percentages declined among both genders, but the change among women was more pronounced than among men. Similarly, using DHSs, Marston et al. (2008) showed that the median ages at first union were higher among men than women in Tanzania, Uganda and Zimbabwe. While among women they increased between cohorts born in 1950s and 1980s in all countries, the patterns of change among men varied (Zimbabwe - increase, Uganda – decrease, Tanzania - no change). Existing research suggests men form unions later than women do, which is in line with studies that had discussed nuptiality patterns among men and women in Sub-Saharan Africa, but conducted no empirical analysis (e.g. Bledsoe and Pison 1994). Moreover, while these findings are consistent with growing body of research documenting postponement of first unions among women in the region (Audrey Harwood-Lejeune 2001; Garenne 2004; Hertrich 2017), they indicate that corresponding changes among men might have differed between countries. This highlights a need for more country-specific analyses in order to understand how gender differences in the age at first union changed in the region.

A larger body of research has explored gender differences in the age at first sex, but based on this evidence, it is challenging to determine whether these are women or men who initiate sexual activity earlier. This is because existing studies encompassed different time periods, age groups and population strata according to union status. The majority of these studies focused on the experience of sexual initiation in adolescent years. Aggregating data for African countries with available DHSs conducted around 2000, Lloyd (2005) found that the percentage of individuals who were aged 20-24 at time of the survey and initiated sexual activity before the age of 20 was smaller among men than among women, suggesting that women initiate sexual activity earlier than men do. Country specific studies provide less conclusively evidence. Using DHSs conducted during 1990s, Singh et al. (2000) found lower (Ghana, Mali) or equal (Tanzania, Zimbabwe) levels of sexual initiation in adolescence among men, as compared to women.[1] Contrary to this evidence, using the same data, Gupta and Mahy

[1] Analysis of individuals aged 20-24 at the time of the survey

(2003) showed that in 6 out of 8 countries[2] which were part of the study, the percent of young adult men who initiated sexual activity in adolescence was higher than among women, which suggests lower ages at first sex among men than among women. Doyle et al. (2012) add to this mixed picture. Using DHSs conducted during 2000s, the authors argued that while smaller proportion of men aged 15-19 initiated sexual activity before the age of 15 in West Africa, in many countries in the rest of the continent males reported higher levels of sexual initiation before their 15th birthday than women did.

Few studies have examined sexual initiation beyond adolescent years. According to Zaba et al. (2004) the median age at first sex during 1990s among DHS respondents aged 20-24 was higher among men than among women in Ghana and Uganda, it was lower in Kenya and no difference between genders was observed in Tanzania, Zambia and Zimbabwe. Using DHSs, Marston et al. (2008) for Tanzania, Uganda and Zimbabwe and of Slaymaker et al. (2009) for Uganda showed that the median ages at first sex have been higher among men than among women for cohorts born between 1950s and 1980s. Finally, a study based on DHSs conducted during 2000s in 34 African countries argued that on average, the percentage of *unmarried* young adults aged 15-24 who ever had sex and the median ages at first sex were higher among men than among women. However, there has been an appreciable variation in these differences between countries and in some of them, men reported having first sex earlier than women (Amo-Adjei and Tuoyire 2018). Consequently, the direction of the difference in the age at first sex between women and men in Sub-Saharan Africa varies depending on the study; the findings for a given country at times differ between studies. Hence, it cannot be clearly determined how gender differences in the timing of sexual initiation changed over time across the region.

Our analysis makes four important contributions to this body of research. First, using retrospective information on the age at first union and first sex from DHS we focus on partnership formation across the whole reproductive life courses of men and women born between 1960 and 1989. Therefore, our analyses are not limited to certain age groups only and encompass all individuals irrespectively of their marital status. To the best of our knowledge, no previous cross-country comparative study on Sub-Saharan Africa used information about the ages of first union and first sex of both men and women from DHS in order to explore partnership formation in such a comprehensive manner. Second, we move beyond the study of the median or mean ages, and we examine how distributions of the age at first union and sex in terms of dispersion differ between men and women. This allows us to provide a more detailed description of gender differences in the timing

[2] Cote d'Ivoire, Ghana, Kenya, Senegal, Tanzania and Zimbabwe, remaining being Burkina Faso and Mali

of partnership formation. Third, we focus specifically on gender differences and, unlike previous studies, we compute measures of gender gaps in the ages at first union and first sex, as well as examine how they changed across cohorts. Finally, we make use of all of the survey data currently available for the region and encompass a large number of countries. This allows us to explore the extent to which the patterns have differed across Sub-Saharan Africa.

Expectations regarding changes over time

First, we briefly discuss why timing of union formation and sexual initiation differs between men and women, and subsequently, why we expect gender differences in Sub-Saharan Africa to have diminished in the last decades.

The ages at which young people initiate sexual activity and form unions can be influenced by social and cultural norms, as well as economic factors. Traditionally defined family roles and the routes to status achievement have been different for men and women. These differences translate into distinct patterns of timing of partnership formation observed between males and females (Amo-Adjei and Tuoyire 2018; Goldscheider and Waite 1986; Marini 1978; Mensch, Singh, and Casterline 2005). In Sub-Saharan Africa, women's life courses have been defined by marriage and reproduction; marriage and fertility have been a way to gain status and financial security among women (Hertrich 2017). Within such traditional family settings, in which arranged unions are common and familial control over the choice of the spouse is substantial, parents have an incentive to marry daughters early and close to puberty in order to protect their sexuality and preserve their virginity before marriage (Malhotra 1997; Mensch, Grant, and Blanc 2006). On the other hand, financial means have been the primary way of status attainment among men. Men are likely to wait with forming unions until they achieve necessary means to support a family, which in the context of some Sub-Saharan Africa countries can also be related to the need to accumulate resources for the payment of bride wealth (Mondain, LeGrand, and Sabourin 2007; National Research Council 1993). As a result, parents might be inclined to marry their daughters early and earlier than their sons; young women themselves might perceived the benefits of marrying early as greater than do men.

Sex and marriage tend to more closely connected among women than men (Lloyd 2005). The fact that women in Sub-Saharan Africa form unions earlier than men do might result in their lower ages at sexual initiation. Moreover, men might have a greater choice over when they initiate sexual activity; among women very early first sex might result from social pressure or coercion (Slaymaker et

al. 2009). On the other hand, since in Sub-Saharan Africa premarital sex has been more socially acceptable among men (Gage-Brandon and Meekers 1993), the ages at first sex among them might be lower than among women. Earlier sexual initiation among men in some contexts could also arise from social norms or peer pressure encouraging young men to be sexually active as a way of proving their masculinity (Eaton, Flisher, and Aarø 2003; MacPhail and Campbell 2001). Therefore, the relationship between gender and timing of sexual initiation could be more complex than timing of first union formation; it is also likely to be more context specific.

Industrialization, modernization and developmental processes can be associated with emergence of more egalitarian gender relations and changes in the patterns of family formation among men and women (Caldwell 1982; Goode 1963). Globalization, urbanization, westernization, increasing exposure to media, rising educational attainment and labor market opportunities are likely to affect social norms and expectations regarding the gender roles (Mensch, Singh, and Casterline 2005). The growth in schooling and employment opportunities, among women in particular, have been among the most dramatic changes that occurred in the last decades in young people's lives in LMICs, including in Sub-Saharan Africa (Lloyd, Grant, and Ritchie 2008). Increasing women's opportunities might change the notion that marriage is the only socially legitimate option for women, break the close connection between puberty and union formation (Malhotra 1997) and eliminate one of the pathways through which women enter unions and initiate sexual activity earlier than men.

With modernization, institutions like schools and labor markets increasingly shape the lives of young people, loosening family control (Grant and Furstenberg 2007). For example, increasing employment and earning potential of women could encourage parents to give up early marriage for their daughters, especially when women's educational attainment might increase the bride wealth price (Isiugo-Abanihe 1994; Jejeebhoy 1995). Moreover, expansion of educational and labor market opportunities contributes to increasing women's autonomy and gives women more agency in the process of spousal selection. Increasing freedom of young people in the choice of their partners and "individualization of marriage" (Lesthaeghe, Kaufmann, and Meekers 1989), lengthens the process which leads to union formation until they find a suitable candidate (Lloyd 2005). Enhanced women's opportunities outside of the domestic spheres might also increase the opportunity cost of marriage among women and reduce their incentives to marry early (Becker 1974). These changes might lessen differences between men and women in the spousal selection process, including the differences in when they form unions.

Finally, increasing women's opportunities and participation in the public sphere results in activities of boys and girls in adolescence and young adulthood becoming more similar. For example, time spent in school environment rather than at home in traditional gender activities among young women can enhance the process of socialization of girls and boys outside of traditional familial constrains (Gupta and Mahy 2003; Lloyd, Grant, and Ritchie 2008). This could mitigate gendered patterns of behavior and result in similar perceptions of boys and girls about when to initiate sexual activity and form unions.

3. Data and Methods

We use Demographic and Health Surveys (DHSs) that are nationally representative surveys of men and women. They include information about all women aged 15-49 residing in households randomly selected according to the DHS program's sampling design (ICF International 2012). The age ranges of men who are interviewed as part of the program differ depending on the country and survey round; in some of them, all men in randomly selected households are interviewed. For comparability, we restrict the analyses to individuals aged 15-49 at the time of the survey. Our study encompasses all of the Sub-Saharan African countries with at least two rounds of DHS that satisfy the following conditions. First, a survey includes both men's and women's questionnaires. Second, all men and women irrespectively of their marital status are part of the survey.[3] Third, a survey includes a question about the current marital status, age at first union and first sex for both men and women. As a result, we use 97 surveys for 27 countries (Table). We pool all of the surveys available for each country, separately for women and men, in order to generate a long-term series of indicators of timing of partnership formation. In order to apply sampling weights to the pooled datasets, we de-normalize individual men's and women's weights for each survey according to the DHS guidelines (ICF International 2012). For that purpose, we use estimates of the population of men and women for each survey-year from the 2019 World Population Prospect (United Nations 2019).

[3] We exclude countries where only ever-married women were interviewed.

Table: Countries, surveys, sample sizes, the youngest and the oldest cohorts covered by the analyses

								Sample size**		Cohorts***	
Country (Abbr.)	**Surveys**							**Men**	**Women**	**Youngest**	**Oldest**
Benin (BJ)	1996	2001	2006	2011	2017			13,363	45,539	1960-64	1985-89
Burkina Faso (BF)	1998	2003	2010					7,943	24,096	1960-64	1980-84
Burundi (BU)	2010	2016						6,044	15,238	1960-64	1985-89
Cameroon (CM)	1998	2004	2011					6,253	14,125	1960-64	1975-79
Chad (TD)	1996	2004	2014					5,936	22,195	1960-64	1985-89
Comoros (KM)	1996	2012						1,512	4,914	1960-64	1980-84
Congo (CG)	2005	2011						4,779	11,015	1960-64	1980-84
DRC* (CD)	2007	2013						6,389	14,677	1960-64	1980-84
Ethiopia (ET)	2000	2005	2011	2016				22,171	45,217	1960-64	1985-89
Gabon (GA)	2000	2012						3,159	6,754	1960-64	1975-79
Ghana (GH)	1993	1998	2003	2008	2014			9,303	18,826	1960-64	1980-84
Guinea (GN)	1999	2005	2012	2018				7,596	23,768	1960-64	1985-89
Cote d'Ivoire (CI)	1998	2011						2,239	5,357	1960-64	1975-79
Kenya (KE)	1993	1998	2003	2008	2014			13,567	37,254	1960-64	1980-84
Liberia (LB)	2007	2013						6,139	9,461	1960-64	1980-84
Malawi (MW)	2000	2004	2010	2015				13,958	53,155	1960-64	1985-89
Mali (ML)	1995	2001	2006	2012	2018			11,987	43,280	1960-64	1985-89
Mozambique (MZ)	1997	2003	2011					6,196	28,041	1960-64	1985-89
Niger (NI)	2006	2012						4,048	12,376	1960-64	1980-84
Nigeria (NG)	2003	2008	2013	2018				31,371	80,727	1960-64	1985-89
Rwanda (RW)	2000	2005	2010	2014				10,076	29,455	1960-64	1980-84
Senegal (SN)	1997	2005	2010	2014	2015	2016	2017	11,755	39,747	1960-64	1980-84
Sierra Leone (SL)	2008	2013						5,254	12,717	1960-64	1980-84
Tanzania (TZ)	1991	1996	1999	2004	2010	2015		11,578	40,849	1960-64	1985-89
Uganda (UG)	1995	2000	2006	2011	2016			9,201	34,854	1960-64	1985-89
Zambia (ZM)	1996	2001	2007	2013				13,171	24,605	1960-64	1980-84
Zimbabwe (ZW)	1994	1999	2005	2010	2015			19,188	30,165	1960-64	1985-89

*DRC- Democratic Republic of the Congo
**total sample size from all survey rounds when samples of men and women are restricted to age 15-49
***cohorts grouped into 5-year groups

Our analyses are based on two retrospective questions about the timing of partnership formation: age at first union and age at first sex. Age at first union corresponds to the age at first marriage or age at first cohabitation, since no distinction is made between these two types of unions when this information is collected. The variable describing the age at first sex allows us to identify the timing of sexual initiation. We calculate measures of the age at first union and sex for cohorts of men and women born between 1960 and 1989, grouping cohorts into 5-year intervals. In order to ensure the representativeness of our results for a given cohort-group, we restrict the analyses to those for

which the information about all of the five cohorts was available for a given country. Our aim is to use as much information as possible, therefore, the end cohorts differ by country depending on the year of the last survey. For the majority of countries, the last cohort-group is that of individuals born in 1980-84 or 1985-89. Since we show the results separately by country, we must keep this in mind when interpreting the results even though it does not pose any problems for the analysis itself.

Questions about the age at first union and age at first sex can suffer from biases. The most commonly discussed ones are recall errors and unwillingness of young individuals to report that they are sexual active (Blanc and Rutenberg 1990; Gage 1995; Neal and Hosegood 2015). These biases can be problematic when studying changes in the timing of partnership formation over time, but we believe they are less of a concern in our study than in previously published research on the topic. In our analyses, we always focus on the comparison of a given indicator between men and women. Therefore, we are not interested in an absolute change in a given indicator over time among men and women separately, but a change among women in relation to men (or vice versa). Therefore, the validity of our results rests on the assumption that the way the abovementioned biases affect the responses of men and women has not changed across cohorts. This assumption is more realistic than the alternative of assuming that individuals are not affected by these biases, which is implicit if these indicators are used to study changes in the timing of partnership formation among only men or only women. Finally, a limitation of the data we use is that in Sub-Saharan Africa, union formation might be a process, which proceeds in stages, rather than a discrete even. Therefore, it might be difficult for an individual to identify the start of a union and to state the exact age at which they entered it (Bledsoe and Pison 1994; Meekers 1992). While we acknowledge these limitations, there are currently no other measures, free from such shortcomings, which could be used for the purpose of this large-scale, cross-national study.[4]

Using pooled DHS surveys, for each country, and separately for men and for women, we estimate cohort trends in the age at first union and the age at first sex. Not all of the individuals in our samples have already entered union or initiated sexual activity. We use survival analysis to take into account right censoring, i.e. the fact that some men and women are still at risk of experiencing these events. We conduct separate analyses for sexual initiation and entrance into first union. In both

[4]An alternative approach could the use of Singulate Mean Age at Marriage (SMAM). This synthetic measure which is calculated based on the current marital status information is however based on the assumption that the first marriage incidence rates are constant over time (Hajnal 1953). If that is not the case, the use of SMAM might be problematic when looking at the changes in the timing of union formation over time (Preston, Heuveline, and Guillot 2001). Moreover, SMAM is a measure of central tendency and does not permit examining heterogeneity in the timing of partnership formation, which is an important aim of our study.

analyses, we follow individuals from age 8[5] onwards until they experience these events, or censor them at the age at the time of the interview. In order to estimate ages at first union and first sex, we use Kaplan-Meier estimator which allows us to calculate the median ages, as well as the ages at which 25% and 75% of the population experiences these events, providing the interquartile range (Forthofer and Lee 1995; Singer and Willett 2003).

Based on the obtained measures, we calculate indicators of gender gaps, separately for each country and cohort. The gender gap in the age at first union is a difference between men and women in the median, 25th and 75th percentile or the interquartile range of the age at first union for a given cohort. We calculate corresponding gender gaps in the age of first sex. In order to examine how these gaps changed across cohorts, we calculate differences in all of the indicators of gender gaps between the youngest and the oldest cohorts for each country. We also compare the changes between the last and the first cohort in a given indicator of the age of first union and the age of first sex, between men and women. Although we only show results for the oldest and the youngest cohorts, we use the estimates obtained for the in-between cohorts to examine the consistency of the observed changes over time.[6] For example, we check whether the trends are consistently in the direction indicated by the change between the last and the first cohort. This gives us confidence that the results we show are not an artifact of the choice of these two cohorts, but represent a plausible direction of change in a given indicator over time.

4. Results

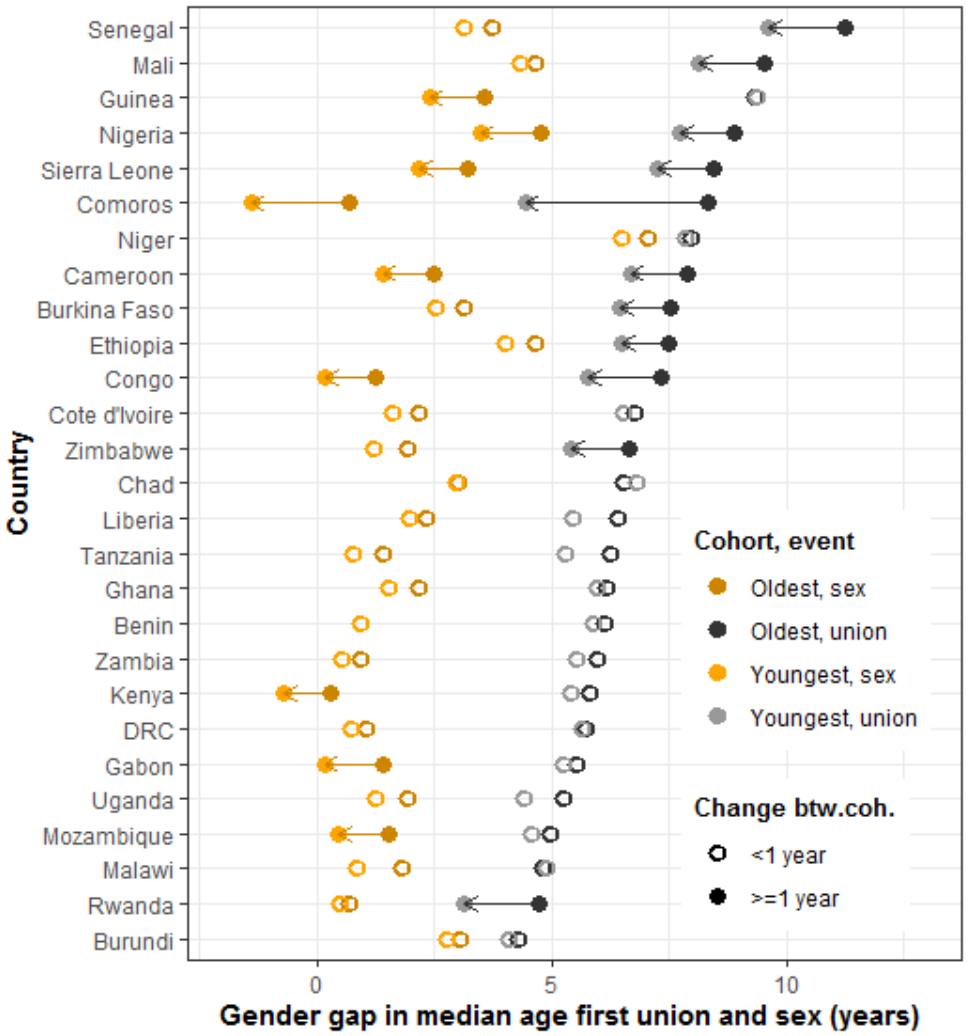
Gender gaps in the timing of partnership formation

Differences between men and women in the median ages at first union and the median ages at first sex for the oldest and the youngest cohorts are presented in Figure 1. Countries are ordered according to the magnitude of gender gap in the median age at first union for the oldest cohort. Men transition to first union later than women, indicated by the fact that gender gaps in all of the countries are greater than zero, which corroborates findings from previous studies (Lloyd 2005; Marston et al. 2009; Mensch, Singh, and Casterline 2005). This pattern did not change across cohorts. The magnitude of differences in the timing of union formation differs substantially between countries: it ranges from around 12 years in Senegal to around four years in Burundi. Although gender gaps in the median age

[5]There were very few individual with age at first sex or union below age 8 and we exclude them from the analysis.
[6] The results for all of the cohorts are available on request.

at first sex are also mainly positive (with the exception of Kenya and Comoros for the youngest cohort), they are smaller in magnitude. This means that differences between men and women in the ages at which they form unions are larger than in the ages at which they initiate sexual activity. The latter ones range from around zero (e.g. Rwanda) to five years (e.g. Niger). Maps in the Appendix show that although differences between men and women in the median ages at partnership formation tend to be largest in Western Africa, there is a substantial degree of diversity within the regions.

Figure 1: Gender gaps in the median age at first union and first sex, oldest and youngest cohorts

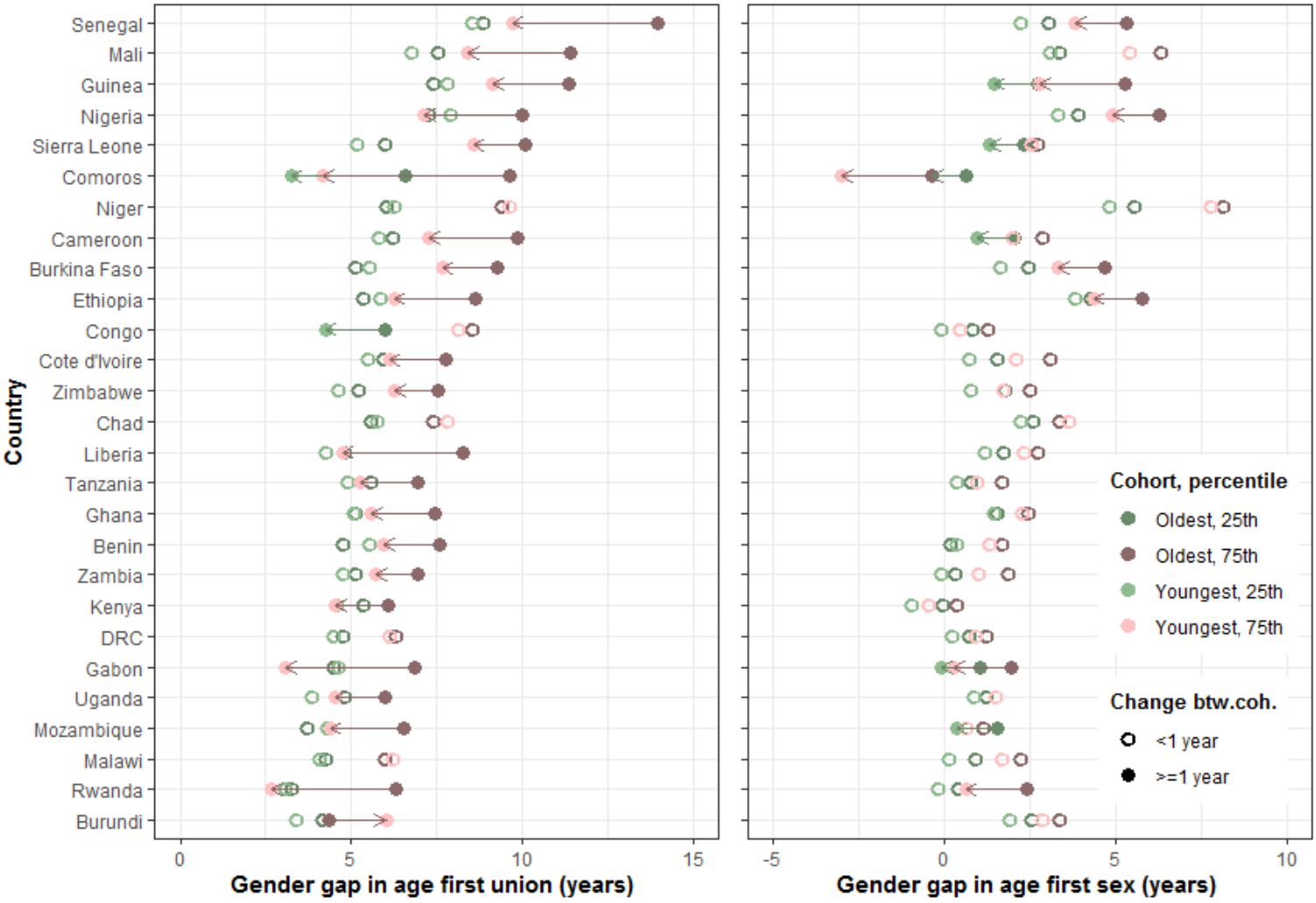


Gender differences in the median age at first union decreased in countries were these gaps were initially largest. Countries where changes were greater than one year are highlighted with arrows. There is some evidence of convergence of countries with initially larger gender gaps with countries where gaps were smaller. Nonetheless, differences between men and women did not disappear, and

in the majority of countries, they continue to be larger than five years. Decreases in gender gaps in the median age of sexual initiation were less pronounced, both in terms of the magnitude and in terms of the number of countries. In some settings, however, differences between men and women disappeared for the youngest cohort, or even became negative (Comoros, Congo, Kenya and Gabon).

Our results show that the relationship between gender and the age at first sex changed over time in some countries. This might partially explain the variations in existing studies about whether these are women or men who initiate sexual activity earlier in life in Sub-Saharan Africa. The largest decreases in gender gaps in the median age at first sex occurred in countries where changes in gender gaps in the median age at first union were also largest, but the pattern is not entirely consistent.

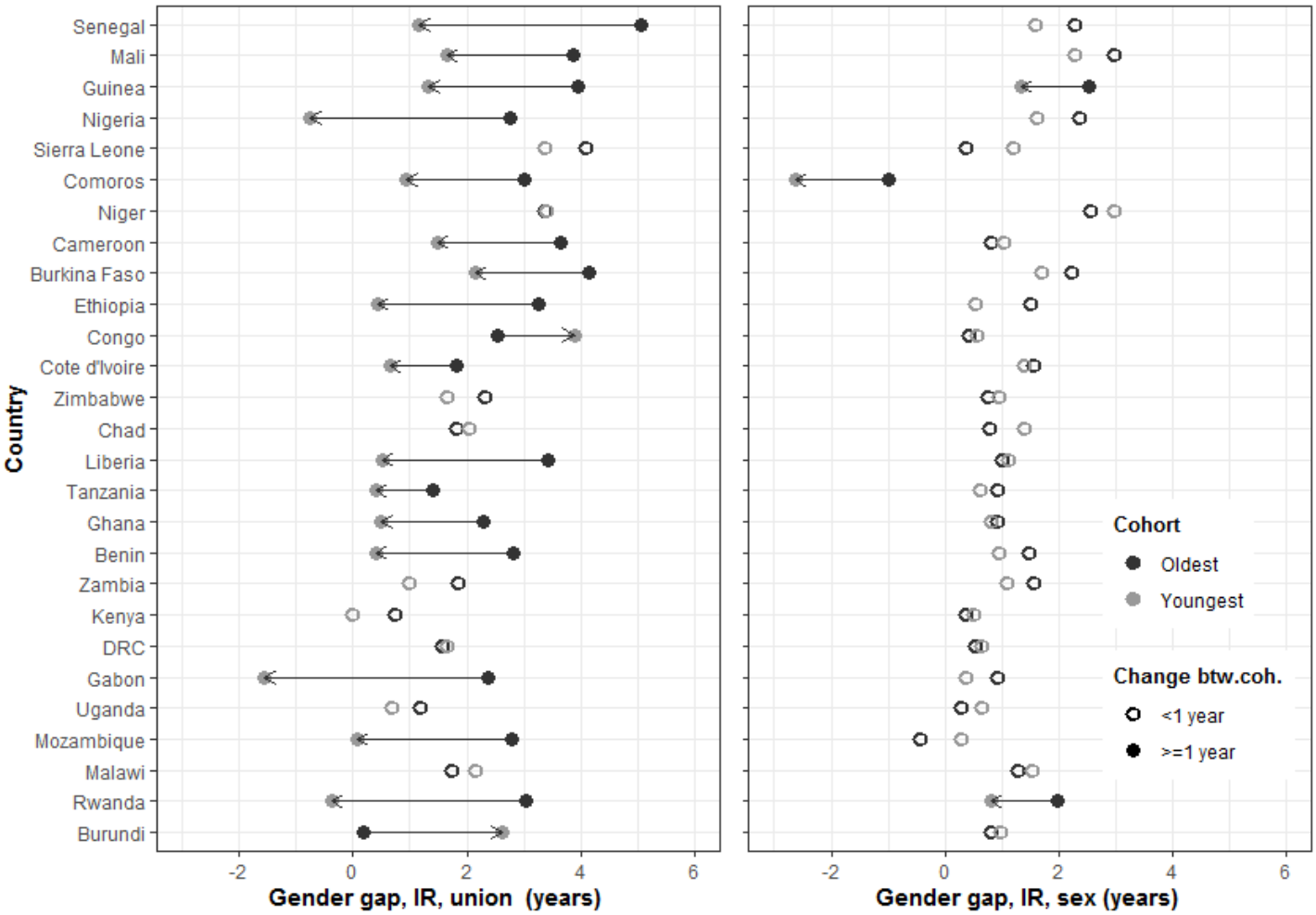
Figure 2: Gender gaps in the age at first union (left) and age at first sex (right): 25th and 75th percentile, oldest and youngest cohort



Gender gaps in the age at which 75% of the population of men and women in a given cohort enters first union were substantially larger than gaps in the age at which 25% of them initiates unions (Figure 2, left). Therefore, differences in the timing of union formation between men and women who enter unions relatively late in a given cohort (top 25%) were much larger than among those who enter unions relatively early (bottom 25%). This pattern is much less pronounced in the case of the age at first sex (Figure 2, right). In the majority of countries, and irrespective of the magnitude of the initial gap, gender differences in the ages at which 75% of the population of women and men form first union decreased, a process not observed when looking at the 25th percentile. This provides unequivocal evidence that gender gaps in the timing of union formation shrunk across cohorts; this is occurring however mainly through the changes in the upper tails of the distributions of the age at first union (i.e., among individuals with relatively late union formation). Corresponding gender gaps in the age at first sex were much smaller and changed to a lesser extent.

Interquartile ranges provide additional insights into these processes. Figure 3 (left) depicts large gender gaps in that measure for the age at first union, for the oldest cohorts (e.g. four years in Mali or Guinea). Hence, once a substantial minority of individuals entered first union in a given cohort, this process occurred much more quickly in the rest of the population among women than among men. Positive gender differences in the interquartile ranges mean that the dispersion of the distributions of the age of first union among men was larger than among women. However, these differences decreased substantially; in some countries, they disappeared (interquartile range equals to zero among youngest cohorts). Consequently, the spread in the distributions of the age at first union is becoming more similar between men and women. There has been virtually no change in the corresponding measure for the age at first sex (Figure, 3 right), but the gender gaps were much smaller, and in many countries already close to zero among the oldest cohort. This suggests that the degree of the diversity in the age at first sex was similar among men and women, and more similar than it was in the case of the age at first union.

Figure 3: Gender gaps in the interquartile range (IR): age at first union (left) and age at first sex (right), oldest and youngest cohort



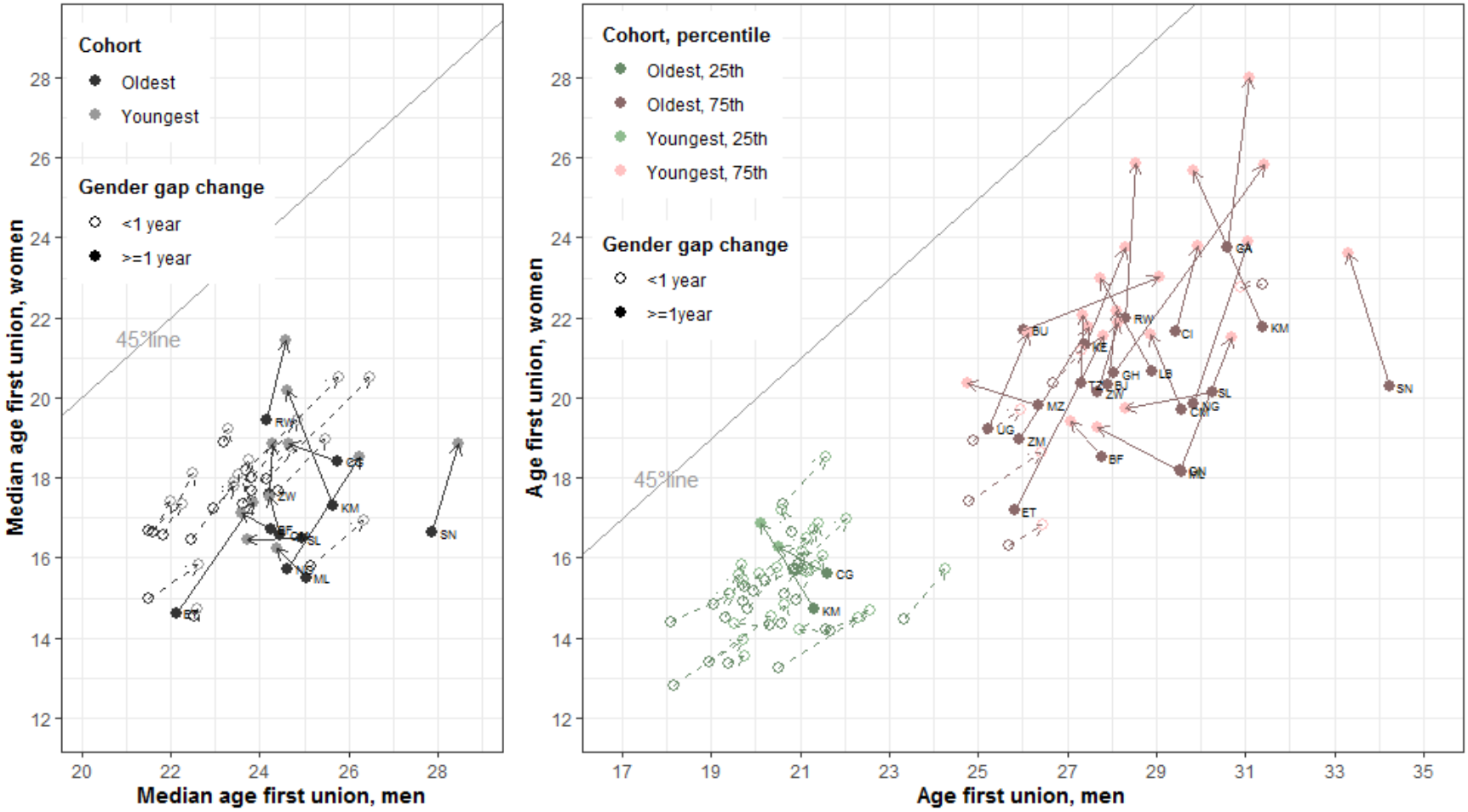
Changes in the timing of partnership formation: Differences between men and women

Figures 4, 5 and 6 depict indicators of timing of partnership formation by gender and by cohort. The solid arrows indicate a direction of change in a given indicator across cohorts, by gender, for countries that were highlighted with arrows in Figures 1, 2 and 3 (where gender gaps changed by at least one year). Dotted arrows represent countries in which changes in gender gaps were smaller than one year.

In countries where gender gaps decreased by at least one year, the median age at first union as well as the 25th and 75th percentiles increased among women (with the exception of Sierra Leone, arrows are pointing upwards in Figure 4). Among men, changes varied between countries: in some, the age at first union increased (e.g. Ethiopia); in others, it decreased (e.g. Comoros). The fact that the majority of arrows are steep rather than flat indicates that changes in the age of first union were generally larger among women than among men. This means that gender gaps in the timing of first union formation, as described by the 25th, 50th and 75th percentiles in Figures 1 and 2, decreased primarily because of first union postponement among women. In a few countries, decreasing age at first union among men was a contributing factor (e.g. Comoros) or changes among men and women were of similar magnitude (e.g. Mali). There are a couple of exceptions to that pattern such as Sierra Leone and Congo for all of the indicators and Mali, Mozambique and Burundi for the 75% percentiles. In these cases, changes among men were larger than among women (corresponding arrows are flat).

In countries where gender gaps in the age at first union changed by less than one year, men and women postponed first unions to a similar extent (dotted arrows are parallel with the 45-degree line which denotes equality of change between men and women). By looking at the medians, it can be seen that the persistence of gender gaps in this indicator resulted from the fact that both men and women delayed union formation.

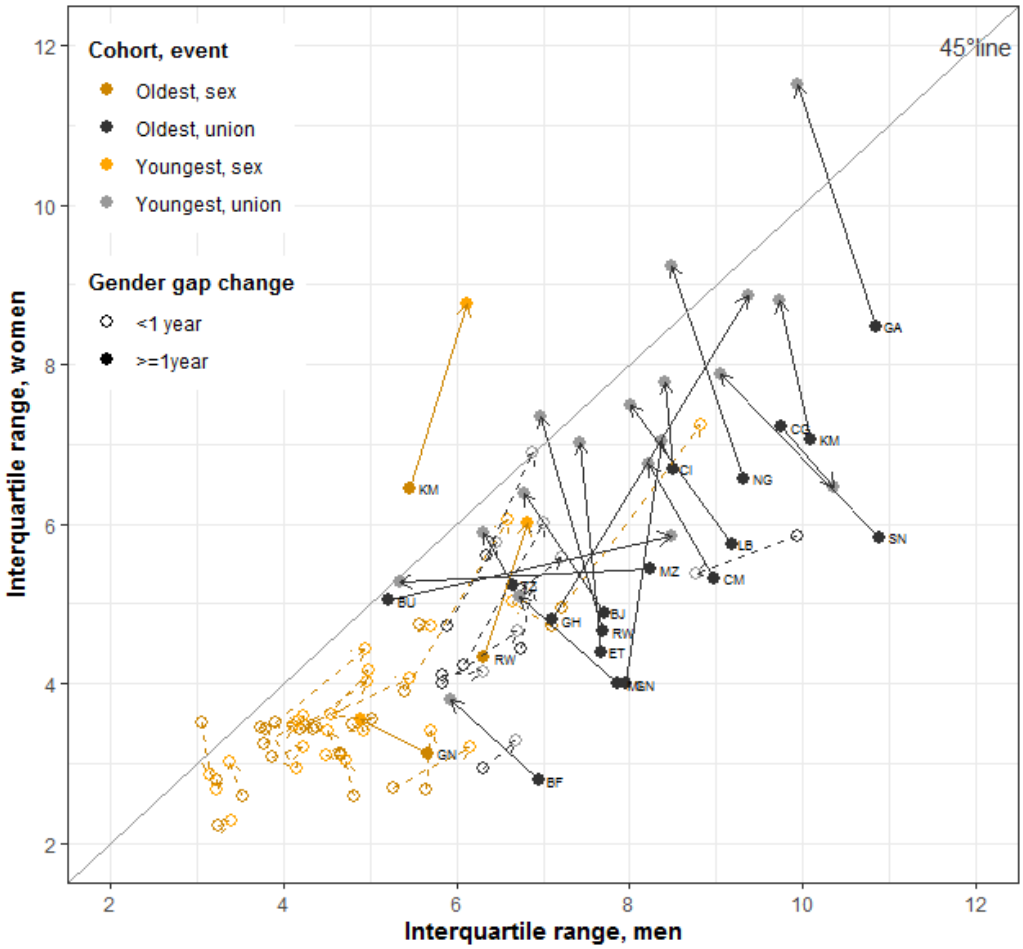
Figure 4: Age at first union: median (left), 25th and 75th percentile (right), by gender, oldest and youngest cohorts



The patterns of change differed between the 25th and 75th percentiles. Changes in the age at which 25% of the population forms first unions were similar among men and women in the majority of countries (except for Congo and Comoros). This involved mainly a small degree of first-union postponement among both men and women, but in some countries, there has been virtually no gender change. Contrary to this result, the ages at which 75% of the population form first unions changed substantially, and particularly among women (e.g. increases up to five years in Ghana or Ethiopia). Thus, changes in the age at first union among women who enter unions relatively late (top 25%) were much larger than changes among women who enter union relatively early (bottom 25%). These processes were responsible for the decreasing gender gaps in the ages at which 75% of men and women form first union, and negligible change in the corresponding gender gap described by the 25th percentiles (shown in Figure 2). It is important to note in the context of these findings that in virtually all countries, more than one quarter of women still enters first union below the age of 18 in the youngest cohort. This is not the case in any of the countries among men.

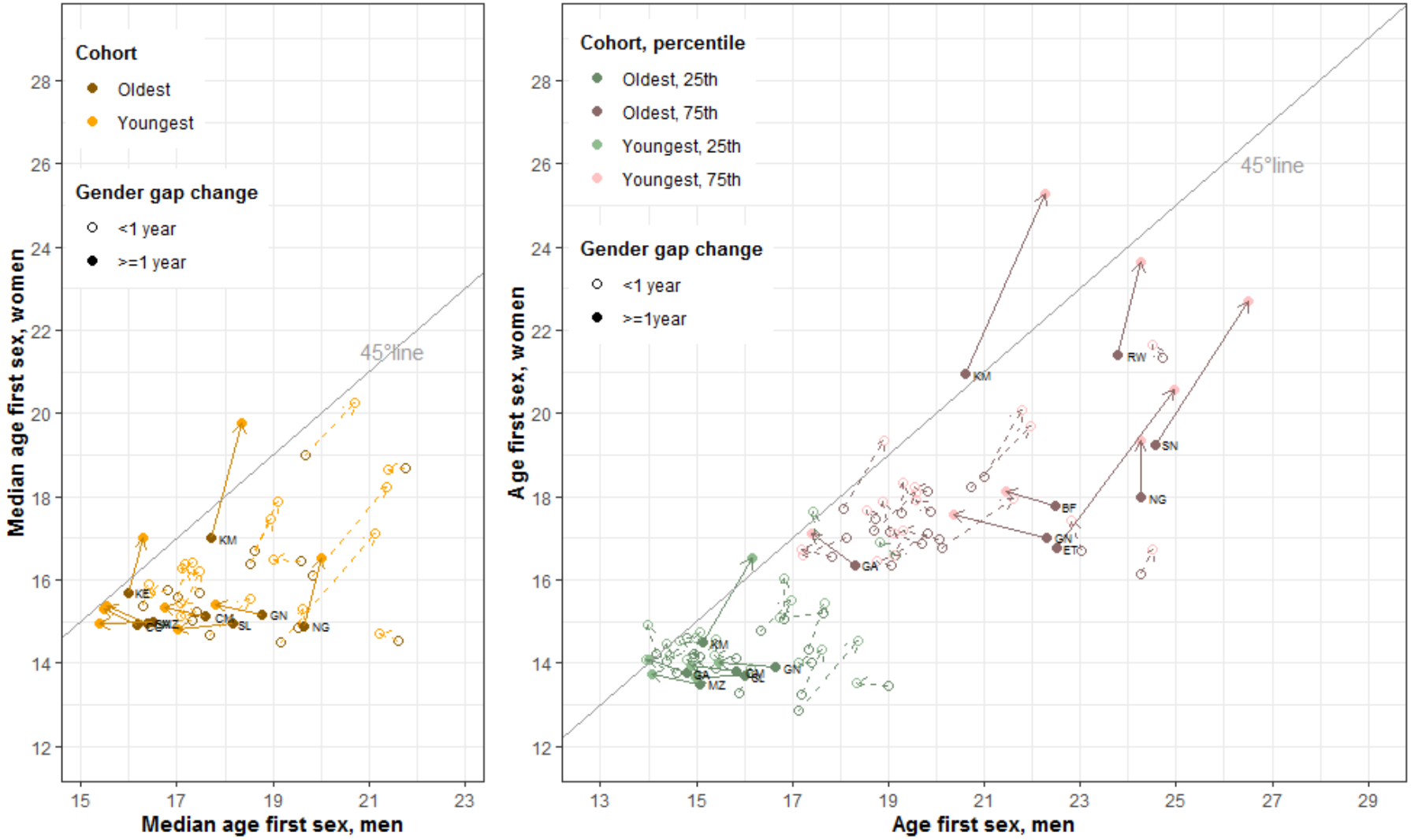
The pronounced change in the age at which 75% of women in a given cohort enter first union, both in absolute terms and relative to men, explains the large increases in interquartile ranges among women (Figure 5) and accordingly, appreciable decreases in gender gaps in that measure (Figure 2). The distributions of the age at first union among women substantially widened across cohorts (e.g. interquartile range increased from around 5 to 9 in Ghana), and have become more similar to those observed among men (points denoting the youngest cohorts are closer to the 45 degree line than points denoting the oldest cohorts) (Figure 5). Therefore, not only are women 'catching up' with men when it comes to the median age of first union in an appreciable number of countries, but the distributions of the age at first union among women in terms of spread are becoming more similar to those observed among men in the majority of nations. Nonetheless, it should be noted that the increasing diversity in the age at first union among women is taking place in the context of much lower overall levels of the age at first union than among men, and as pointed out above, continuously high prevalence of very early unions.

Figure 5: Interquartile range: age at first union and age at first sex, by gender, oldest and youngest cohorts



The patterns of change in the age at first sex are different (Figure 6). The majority of the points, relating to both the youngest and the oldest cohorts, is generally closer to the 45-degree equality line than it was in the case of the age at first union. This is in line with the findings from Figures 1 and 2 showing that differences between men and women in the timing of sexual initiation are much smaller. In countries where gender gaps decreased by at least one year, among women, the median, 25th and 75th percentile for the age at first sex either increased (e.g. Kenya) or remained relatively stable (e.g. Guinea). Among men, these processes again varied between countries: in some, the age at first sex increased (e.g. Comoros); in others, it decreased (e.g. Sierra Leone).

Figure 6: Age at first sex: median (left), 25th and 75th percentile (right), by gender, oldest and youngest cohorts



While changes in the age at first union among women were generally more pronounced than among men, this is less evident for the age at first sex. By looking, for example, at the medians, it is evident that in Kenya, Comoros and Niger, changes among women were larger than among men (steep arrows). However, the opposite was true in the rest of the countries. Therefore, gender gaps in the age of first sex decreased due either to postponement of sexual initiation among women or due to decreasing age at first sex among men. In this part of the analysis, we pay particular attention and examine the consistency of trends over time among men, given the rather unexpected decreases in the age at first sex in an appreciable number of countries. We find that these trends are consistently downwards across cohorts, which gives confidence that they do represent a trend towards earlier ages of first sex among men.

In countries where gender gaps changed little (dotted arrows) men and women postponed sexual initiation at a similar pace, or the ages at first sex remained stable among both genders. Generally, changes in the timing of sexual initiation were smaller than in the timing of first union formation; so was the variation in the magnitude of changes between the 25th and 75th percentiles for that process. Consequently, for both men and women, interquartile ranges differed between cohorts to a much smaller extent for the age at first sex, as compared to the age at first union (Figure 5). Figure 5 also confirms findings from Figure 3 and shows that interquartile ranges for the age at first sex were similar in magnitude among men and women.

Finally, Figure 5 reveals that interquartile ranges for both men and women were smaller for the age at first sex than for the age at first union, and that was the case for both cohorts. Hence, for both genders, once a substantial minority of individuals initiates sexual activity, the process occurs more rapidly among the rest of the population than takes place in the entrance into unions. Consequently, among both men and women, heterogeneity in the timing of union formation is greater than in the timing of sexual initiation. As we noted earlier, this diversity in the age at first union increased substantially across cohorts among women.

5. Discussion and conclusion

Using information about the ages at first union and first sex of both men and women from Demographic and Health Surveys, this study provided a comprehensive description of gender differences in the timing of partnership formation in Sub-Saharan African countries. As hypothesized, we find evidence that these differences decreased across cohorts. The growing similarity in the timing of transition to adulthood between men and women occurs as a result of many different changes.

First, our results document a trend towards convergence of countries where gender gaps in the median age at first union were largest, with those where the magnitude of these gaps was smaller. We identified a clear pattern of women 'catching up' with men when it comes to the timing first of unions in these settings. Interestingly, differences between men and women decreased most in countries where the gaps were largest. This suggests that the social, cultural and economic forces contributing to earlier union formation among women than among men might be weakening in settings where they were strongest. These results could point to changing social norms that divide the roles that men and women are expected to play as well as decreasing gender differences in their opportunities outside of the domestic spheres, as described in the introductory review of the literature. If the changes we document are indeed a reflection of such shifts and increasingly equitable gender roles, the more similar trajectories of men and women in terms of first union formation might have positive implications for women's empowerment. For example, it might be expressed through increased bargaining power in marriage or more equal balance of power within households.

Nonetheless, differences in the median ages at first union in the region did not disappear. Moreover, by expanding the analysis beyond the medians, we documented that although union formation trajectories are becoming more similar between women and men, this is happening in the context of persistence of very early union formation among substantial portion of women's population. These seemingly contradictory processes, i.e. persistence of early unions and first union postponement, have coexisted and have resulted in increasing within-country heterogeneity in the timing of union formation among women. We showed that first-union postponement was most pronounced among women with relatively late pattern of union formation, which resulted in increasing dispersion of the ages of first union in women's populations. While the spreads of the first-union age distributions among women are becoming more similar to men, ages at which women enter unions still are very early and may have adverse consequences (Dahl 2010). Therefore, increasing

heterogeneity in the timing of union formation among women potentially has a different meaning and might have different implications than the corresponding heterogeneity observed among men. It could be an expression of growing social inequalities in the context of rapid social and economic changes observed in the region. It is possible that some population groups, e.g. higher educated or urban women, who are benefiting from modernization processes, postpone unions towards the pattern followed by men. On the other hand, the persistence of norms relating to very early and child marriage might be strongest among less advantaged subgroups, where resistance to change by the family could be greater. If that is true, the growing heterogeneity in the age at first union in the context in which one quarter of women still marry before the age of 18, might suggest a pattern of increasing social polarization in Sub-Saharan Africa.

Beyond first union formation, we showed that decreasing gender gaps in the age at first sex were less pronounced, presumably because they were initially much smaller. Moreover, sexual initiation is a more concentrated process when it comes to the age distribution; the distributions of the age at first sex have been similar between men and women. However, in a number of countries, differences between men and women did change and in fact fell to zero or become negative. This represents an important shift in the context of sexual initiation in the region, whereby gender differences are disappearing or reversing. Interestingly, what drives these changes differs between countries. Generally, postponement of first sex was the prevailing pattern among women, even if of small magnitude, and that changing transition was the main driver of decreasing gender gaps in a number of countries. In a larger number of countries however, the age at first sex decreased among men, and the magnitude of that change was greater than the change observed among women. The earlier sexual initiation among men should be taken into account when considering the sexual and reproductive health needs of young men in the region.

These results enrich the understanding of partnership formation dynamic in the context of rapid social and economic changes observed in the last decades in Sub-Saharan Africa. Our paper contributes to studies which showed that the relationship between development and changes in family formation in LMICs differed between men and women (Pesando and GFC-team 2019). Our results suggest that we should be cautious in assuming that socioeconomic forces will affect women's and men's partnership formation trajectories similarly. By conducting country-specific analyses, we provided an in-depth examination of these processes for Sub-Saharan Africa. We showed that in almost all countries women postponed first union and, to a smaller extent, first sex. Among men, in

some parts of the continent there was a clearly pattern of postponement, and in others, earlier over time transition to adulthood. Greater heterogeneity of males between countries suggests that changes in timing of partnership formation are more context specific than many general theories of family change presume.

Our analysis demonstrates that in some countries, decreasing age at first union among men was a contributing factor to diminishing gender gaps the timing of union formation. Van de Walle and Meekers (1994) suggested that increasing emancipation of young people from the control of the family might result in decreasing ages at first union, a prediction that is consistent with our findings. This could happen, for example, if families abandon the practice of paying bride wealth, which decreases the cost of marriage and allows men to form unions earlier. Moreover, we showed that in some countries, decreasing age at first sex was the main driver of reduced gender differences in the timing of sexual initiation. Gupta and Mahy (2003) argued that while increasing educational attainment among women was associated with lower probability of early sex among girls in a number of Sub-Saharan African countries they examined, the direction of this relationship was opposite for men in some countries. This pattern could explain decreases in the age at first sex men, if educational achievements among them increased across cohorts. Understanding the determinants of the transition to adulthood among men is still limited; given the wealth of the available data, examination of these processes, including country-specific analyses, could be a fruitful direction for future research.

The results of this paper highlight the importance of taking a broader perspective in order to understand the partnership formation dynamics in the region. By looking at the whole distributions of the ages at first union and sex, as well as including men, we show that the changes in nuptiality and sexual activity in Sub-Saharan Africa fit into two contrasting theoretical frameworks. On the one hand, our results give support to the convergence framework (e.g. Wilson 2007), by showing that men and women are becoming more similar in terms of timing of transition to adulthood and countries are becoming more similar in terms of the magnitude of gender gaps. On the other hand, our results fit into the divergence as well as 'leaders' and 'laggers' frameworks, reflected in increasing polarization in the patterns of union formation within the populations of women. Among men, diverging trends in the timing of transition to adulthood between countries can also be seen as a reflection of growing heterogeneity in partnership formation in the region. Overall, we show that the changes in nuptiality and patterns of sexual activity in Sub-Saharan Africa are characterized by considerable complexity that future studies could profitably explore in greater depth.

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Appendix

Maps: Gender gaps in the median age at first union (left) and the median age at first sex (right), oldest cohort