

Trends in Modern Contraceptive Use among Young Adult Women in sub-Saharan Africa 1990 to 2014

Julia Andrea Behrman, Kelsey Quinn Wright, Monica J. Grant, and Erica Soler-Hampejsek

This article provides updated estimates of trends in modern contraceptive use among young adult women (aged 15–24) who have had sex, using Demographic and Health Survey data from 23 sub-Saharan African countries (1990–2014). In East/South Africa, parous women had higher modern contraceptive use than nulliparous women and larger increases in modern contraceptive use over time. In the West/Central region, nulliparous women had higher modern contraceptive use than parous women and larger increases in modern contraceptive use over time. Most of the increase in modern contraceptive use was driven by an increase in short-acting—rather than long-acting—methods across regions and parity groups. Although parous women had higher unmet need for family planning in both regions, nulliparous women had larger increases in unmet need for family planning over time in the East/South region. Decomposition analysis suggests that increases in use of modern contraceptives are largely driven by increases in the rate of contraceptive use rather than changes in the parity composition of women.

The fertility transition has started virtually everywhere in sub-Saharan Africa; fertility decline, however, has been slower and later than in other regions of the world (Bongaarts and Casterline 2013; Bongaarts 2016). Given the high levels of fertility, considerable policy and programming has focused on improving women's access to and use of modern contraceptives. For example, the 2006 Maputo Program of Action—which was signed by 48 African Union member countries—called for universal access to reproductive health services by 2015. Following the 2012 London Summit on Family Planning, more than 41 countries committed to the principal that access to life-saving contraception is a fundamental right for women around the world. As a result of these and other efforts, the average median modern contraceptive use among married women in sub-Saharan Africa increased from 3 percent in the 1970 to 1984 period to 18 percent in the 2000 to 2015 period (Tsui, Brown, and Li 2017). Nonetheless, rates of modern contraceptive use in Africa are

Julia Andrea Behrman is Assistant Professor of Sociology and Faculty Fellow, Institute for Policy Research, Northwestern University. Email: Julia.Behrman@northwestern.edu. Kelsey Quinn Wright is a doctoral student and Monica J. Grant is Associate Professor, Department of Sociology, University of Wisconsin-Madison. Erica Soler-Hampejsek is an independent consultant.

considerably lower than in other regions of the world, raising important questions concerning how to meet the contraceptive needs of underserved African women.

There is consensus that more research, policy, and programming attention needs to be paid specifically to the reproductive health needs of young adult African women, who often have particularly low contraceptive use (Bearinger et al. 2007; Bankole and Malarcher 2010; Prata, Weidert, and Sreenivas 2013; HIP 2015; Santhya and Jejeebhoy 2015; Radovich et al. 2018). Young adult women have a unique set of reproductive health needs and face distinct challenges in accessing reliable contraception (Marston and King 2006; Williamson et al. 2009; Chandra-Mouli et al. 2014). While considerable research focuses on contraceptive use among married women who have started childbearing (Cleland, Ndugwa, and Zulu 2011; Do and Kurimoto 2012; Tsui, Brown, and Li 2017), sexual activity prior to marriage is common among young African women and is increasing in many places along with increases in age at first marriage (Lloyd 2005; Mensch, Grant, and Blanc 2006; Biddlecom et al. 2008; Bongaarts, Mensch, and Blanc 2017; Clark, Koski, and Smith-Greenaway 2017). Recent policy and programming emphasis on integrating family planning services into postpartum care and infant and child health services (e.g., immunization visits) (HIP 2013, 2017) may overlook the contraceptive needs of young sexually active women who have not initiated childbearing. The persistence of birth spacing as the dominant rationale for family planning programs in sub-Saharan Africa may also mean the contraceptive needs of mothers are prioritized over those of childless young women (May 2017).

This article provides updated estimates of trends in modern contraceptive use among young adult women (aged 15–24) who have had sex, using Demographic and Health Survey (DHS) data from 23 sub-Saharan African countries. We present trends over time between 1990 and 2014 in the modern contraceptive prevalence rate (mCPR), the long-acting reversible contraceptive prevalence (LARC) rate, the short-acting contraceptive prevalence rate, and unmet need for family planning (including unmet need for both modern and traditional methods). We disaggregate by region, country, and parity status. We calculate the annualized rate of change for all the indicators to quantify changes in modern contraceptive use between regions, countries, and parity groups. In addition, we conduct a decomposition analysis to assess the relative contribution of changes in parity distribution versus changes in the modern contraceptive use rate within parity groups to the overall change in the modern contraceptive use rate between 1990 and 2014.

Although both modern and traditional contraceptive methods are common in Africa (Blanc et al. 2009; Rossier and Corker 2017), we focus on modern contraceptive methods because modern methods are more reliable and in some instances (such as with barrier methods) protective against sexually transmitted infections. Furthermore, modern methods must be attained in a clinic, store, or other outside facility, and thus may be particularly difficult to access for young adult populations, making them of interest to this study. Nonetheless, although the focus of the study is on modern methods, the exclusion from the analyses of the use of traditional methods could mean that the picture of young adult women's contraceptive use is only partially complete.

Our analysis enhances current scholarship on young adult women's reproductive health in Africa in three key dimensions. First, we provide updates to earlier studies by Cleland and Ali (2006), Cleland, Ali, and Shah (2006), and Blanc and colleagues (2009) on trends in

modern contraceptive use among young adult African women. Our analysis also complements recent scholarship that has explored young adult contraceptive prevalence, but not changes over time (Chandra-Mouli et al. 2014; Radovich et al. 2018). Second, we disaggregate all analyses by parity status in contrast to many studies on the topic that examined how contraceptive use varies by marital status (Cleland, Ali, and Shah 2006; Blanc et al. 2009; MacQuarrie 2014; Hounton et al. 2015; Radovich et al. 2018). In doing so, we contribute to a small but growing literature highlighting that parous women who have had a child and nulliparous women who have not had a child may have differential access to reproductive health services and differential reproductive health needs. This is particularly relevant because premarital births are rising in many places in Africa (Clark, Koski, and Smith-Greenaway 2017), and marriage and first birth may represent distinct social processes. Indeed, others have found evidence that while the length of time between age at first sex and age at first marriage has increased over time, the gap between age at first marriage and age at first birth has narrowed (Bongaarts, Mensch, and Blanc 2017). Third, our decomposition exercise demonstrates the importance of distinguishing use rate versus compositional effects when looking at contraceptive uptake.

Young Adult Women's Use of Modern Contraceptive Methods in sub-Saharan Africa

Since the 1980s, contraceptive use among young adult women in sub-Saharan Africa has been increasing in line with global trends (Cleland and Ali 2006; Cleland, Ali, and Shah 2006; Blanc et al. 2009; Chandra-Mouli et al. 2014; Radovich et al. 2018). For example, a study of young adult women from 18 African countries suggests that the median proportion of condoms for pregnancy prevention use rose from 5 percent to 19 percent between 1993 and 2001 (Cleland and Ali 2006). Nonetheless, available evidence suggests that young adult women disproportionately use short-term methods (e.g., condoms), whereas older African women use a combination of short- and long-term methods (Radovich et al. 2018). Furthermore, on average 26–30 percent of currently married women ages 15–24 and 40–41 percent of currently unmarried women ages 15–24 report an unmet need for family planning in the West/Central and East/South regions of Africa (MacQuarrie 2014).

Given the vast heterogeneity of sub-Saharan Africa, there are likely regional differences in young adult women's contraceptive use. Among women of reproductive age (i.e., 15–49), modern contraceptive use is higher in East and Southern Africa than in West and Central Africa (Tsui, Brown, and Li 2017), and it is plausible that trends would be similar for young adult populations. In part, these regional differences reflect divergent trends in economic development and governments' willingness to support family planning initiatives (May 2017; Mbacké 2017). The comparatively higher HIV/AIDS prevalence in the East and Southern regions has also led to additional policy and programmatic attention on condom use in this region. Young women's educational gains have also been larger in the East and Southern regions than the West and Central regions, which has contributed to changing trends in transitions to adulthood in these regions (Bongaarts, Mensch, and Blanc 2017).

Considerable literature explores how young adult women's contraceptive use varies by marital status, with several studies indicating that contraceptive use is higher and has

increased more among sexually active unmarried young women than among their married counterparts (Blanc et al. 2009; Tsui, Brown, and Li 2017; Cleland, Ali, and Shah 2006), although unmet need for family planning is also higher among unmarried than married women (MacQuarrie 2014). This may be because sexually active unmarried young adult women have a higher incentive to avoid an unwanted premarital pregnancy, although there is considerable variation in the prevalence of premarital pregnancy across sub-Saharan Africa (Clark, Koski, and Smith-Greenaway 2017). Alternatively, differences in adolescent contraceptive use by marital status may reflect that young women who marry at early ages are disproportionately of lower socioeconomic status and might not have practiced contraception anyway (Hounton et al. 2015).

Although the literature treats marital status as a discrete category for analyzing contraceptive use, decades of demographic research have revealed how marriage in many African contexts is a complicated social process that often involves multiple steps and a long time horizon (van de Walle 1965; Bledsoe 1990; Meekers 1992; Bledsoe and Pison 1994; Johnson-Hanks 2006). Marriages differ in their degree of formalization, the completeness of bridewealth or other ceremonial payments, and the temporal ordering of sexual initiation, cohabitation, and ceremony (Meekers 1992). Patterns of contraceptive use may vary across the marriage process, thus from a measurement perspective the distinction between premarital and postmarital contraceptive use may be fuzzy.

In contrast, parity is a more clearly defined status marker with direct links to contemporary family planning initiatives. Comparatively less literature, however, explores how young adult women's contraceptive use varies by parity status. Even when studies do disaggregate by parity status, they often combine women with zero children and one child into the same category, thus conflating the parous/nulliparous distinction (Gebreselassie et al. 2017). One important exception is a study by Hounton and colleagues (2015) that compares contraceptive use among parous and nulliparous women in Burkina Faso, Ethiopia, and Nigeria, finding that young mothers are significantly less likely to practice contraception than young nulliparous women. This highlights that although there may be overlap in trends in contraceptive use between parity status and marital status, there may also be reasons why parity status is important separately from marital status.

Why Might Contraceptive Use Depend on Parity Status?

There are several reasons why young adult women's contraceptive use may depend on their parity status. Discrimination in family planning service provision based on age, parity, and marital status is common in many places in Africa, such as when service providers disapprove of premarital sex or contraceptive use for nulliparous women (Rivera et al. 2001; Bankole and Malarcher 2010). In many contexts, women face pressure to have a child soon after marriage, thus contraception is not deemed acceptable until after a first birth (Rivera et al. 2001; Bankole and Malarcher 2010). Even when services are provided to nulliparous women, providers may push for short-acting methods (e.g., condoms) because of misconceptions that long-acting methods are only appropriate for women with children (Nalwadda et al. 2011; Chandra-Mouli et al. 2014). For example, a survey of 20 public and private family planning service providers throughout all four districts of Uganda found that one-quarter of providers

reported women needed to be a minimum age or have a minimum number of children to be referred for long-acting contraception methods (Wright et al. 2017). Comparable findings about discrimination in type of provision based on parity have been noted in other studies in Kenya, South Africa, and Uganda (Wood and Jewkes 2006; Nalwadda et al. 2011; Tumlinson, Okigbo, and Speizer 2014).

Difficulty accessing long-acting contraception means that young adult women are more likely to rely on short-acting methods (e.g., condoms) that are more widely available for commercial purchase and do not require an outside medical professional, but that are less reliable and less subject to women's control (Bearinger et al. 2007). An analysis of 33 sub-Saharan African countries found that young adult women (aged 15–24) were much more likely than older women to rely upon short-term methods that were obtained from limited-capacity private providers and/or commercial venues (Radovich et al. 2018). Nonetheless, there may be stigma attached to condom use, because condoms are associated with sexual promiscuity (Tavory and Swidler 2009; Castañeda, Brindis, and Comey 2010). Given the stigma surrounding condoms and other forms of contraception, young adult women may not even attempt to access contraceptives or to ask partners to use contraceptives because of fear or embarrassment (Biddlecom, Singh, and Munthali 2007). Even when adolescents are knowledgeable about where to access contraceptives, the costs associated with purchase (particularly from private sources) are often prohibitively high for adolescents who do not have independent income (Biddlecom, Singh, and Munthali 2007).

Young nulliparous women may also have differential access to reproductive health services simply because young African women may encounter formal health-care facilities and reproductive services for the first time in the period during pregnancy or after a first birth (Reynolds, Wong, and Tucker 2006). Many Africans continue to lack access to essential health-care services—particularly if they are poor and/or live in rural areas (Peters et al. 2008)—and adolescents face unique obstacles accessing health-care services (Bearinger et al. 2007). For example, a sizable proportion of sexually active adolescents in Burkina Faso, Ghana, Malawi, and Uganda remained unaware of sources to access contraception (Biddlecom, Singh, and Munthali 2007). There has been recent emphasis on integrating family planning services into postpartum care and infant and child-health services to reach women who have not previously been exposed to modern contraceptive methods (HIP 2013, 2017). The success of this integration is borne out by a recent study of young sexually active women in Burkina Faso, Ethiopia, and Nigeria that found child immunization to be one of the strongest predictors of contraceptive use (Hounton et al. 2015). While efforts to integrate family planning services into early child health care are clearly beneficial, they will fail to reach women who have not initiated childbearing.

Finally, young adult women may face serious information gaps about contraception, particularly if they have not had a pregnancy and encountered the health-care system. A study of adolescents in Burkina Faso, Ghana, Malawi, and Uganda found that less than half of young men and women report having school-based sexual education (Bankole et al. 2007), thus suggesting that schools are playing an inadequate role in closing the contraception knowledge gap. As an illustration, the proportion of adolescent females who had detailed knowledge about a modern contraceptive method was only 9 percent in Burkina Faso, 28 percent in Ghana and Malawi, and 32 percent in Uganda (Biddlecom, Singh, and Munthali

2007). Other studies suggest that misconceptions about the side effects and proper usage of contraceptives are common among youth in sub-Saharan Africa (Richter and Mlambo 2005; Wood and Jewkes 2006). Perhaps because of this, rates of contraceptive discontinuation are considerably higher among adolescents than among older adult women (Blanc et al. 2009).

METHODS

Sample

We use Demographic and Health Survey (DHS) data from the 23 sub-Saharan African countries that have three or more rounds of DHS surveys collected between 1990 and 2014. For a full list of countries and survey years used, see Appendix 1. The DHS are cross-sectional nationally representative surveys of reproductive-aged women (aged 15–49) that contain detailed information on reproductive health and contraceptive use. Standardized questionnaires facilitate cross-national comparisons.

We limit our sample to young adult respondents between the ages of 15 and 24 who have ever had sex. We focus on young women who have had sex—rather than all young women—because the percentage of young women who have had sex has changed over time (see Table 3) and we do not want our estimates of contraceptive use or unmet need for family planning to be driven by trends in sexual activity rather than contraceptive uptake. Additional descriptive analysis not shown suggests very few young women who never had sex use contraception in the countries under study; only in four countries did contraceptive prevalence for this group exceed 1 percent and it was never greater than 3 percent. If we were to include all young women, we would conflate trends in contraceptive use among those who are actually at risk for contraceptive use (i.e., who have had sex) with trends in the proportion of young women who had ever had sex.

In our analysis, women are coded as parous if they have ever had a live birth (regardless of whether the child is currently alive), but not if they have never had a live birth but are currently pregnant and/or have had an abortion, stillbirth, or miscarriage. Although the DHS asks about terminated pregnancies they do not differentiate between abortion, stillbirth, or miscarriage. On average, women who had any type of termination but zero live births consisted of less than 5 percent of our sample populations (although this variable is unavailable in selected DHS surveys prior to 2000). As a supplement, we provide information on the contraceptive behaviors of nulliparous women who have had an abortion, stillbirth, or miscarriage (see Appendix 2). Nulliparous women who have experienced a termination make up 4.4 percent of the post-2000 sample; one-quarter of these women report current contraceptive use.

We provide both country-level and regional estimates. To understand regional trends in young women's contraceptive use, countries in the sample are aggregated into East/South Africa and West/Central Africa regions using DHS regional categorizations. We rely upon the DHS regional categorization—rather than the UN's regional categorization of Western, Central, Eastern, and Southern Africa—because we do not have enough countries to conduct standalone estimates for the Central and Southern regions. Individual country estimates are weighted using sample weights provided by the DHS. Regional estimates are weighted by

population weights for the 15–24-year-old female population taken from the U.S. Census Bureau's International Program database for the 23 countries in the analysis.

Measures

Modern Contraceptive Use

All women in the DHS are asked if they are currently using modern methods of contraception (i.e., oral contraceptive pills, implants, injections, intrauterine devices, male or female condoms). We calculate the mCPR as the percentage of women aged 15–24 who have ever had sex who are currently using modern contraceptive methods, in accordance with the Performance Monitoring and Accountability 2020 indicators (PMA2020 2017). We use the standard definition of modern contraceptive use shared by PMA and DHS.

Modern Long-Acting Reversible Contraceptive Use

Modern LARC methods include implants and intrauterine devices. We calculate the modern LARC prevalence rate as the percentage of women aged 15–24 who have ever had sex who are currently using modern LARC methods.

Modern Short-Acting Contraceptive Use

Modern short-acting contraceptive methods include oral contraceptive pills, male or female condoms, and injectables. We calculate the modern short-acting contraceptive prevalence rate as the percentage of women aged 15–24 who have ever had sex who are currently using modern short-acting contraceptive methods.

Unmet Need For Family Planning

Unmet need for family planning is defined as wanting to stop or delay childbearing but not currently using any method of contraception. We use the revised DHS definition to calculate the unmet need for family planning prevalence rate as the percentage of women aged 15–24 who have ever had sex who report an unmet need for limiting (wants no more children) or spacing (wants next child in more than two years, wants another child and is undecided on timing, or is undecided on whether they want another child) (Bradley et al. 2012). The DHS definition of unmet need does not distinguish between unmet need for modern versus traditional methods of contraception, although the assumption is that unmet need would be met with modern methods. Although our analysis focuses on modern contraception, we use the standard DHS definition for unmet need to be in line with convention and past estimates of unmet need.

All indicators of contraceptive prevalence and unmet need are calculated for each round of the DHS at the country level for parous and nulliparous women. These estimates are then aggregated at the regional level. We also calculate the annualized rate of change of each indicator for the period 1990–2014.

Decomposition Analysis

Observed increases in young adult women's use of modern contraceptives could be the result of an increase in the rate of modern contraceptive use. However, this increase could also be

the result of changes in the composition and level of parity among young adult women. To address this compositional concern, first we present descriptive information about changes over time in the percentage of women who have had sex and the percentage of women who have had a live birth. Next, we conduct a decomposition of the proportion change in mCPR due to changes in parity distribution versus changes in mCPR rate change over the 1990–2014 period. We use a standard decomposition equation (Preston, Heuveline, and Guillot 2000) as follows:

$$\Delta mCPR = \sum_i \left((C_i^{t2} * C_i^{t1}) * \left[\frac{M_i^{t2} + M_i^{t1}}{2} \right] \right) + \sum_i \left((M_i^{t2} * M_i^{t1}) * \left[\frac{C_i^{t2} + C_i^{t1}}{2} \right] \right)$$

where C_i is equal to the proportion of women in selected parity groups (nulliparous versus parous) at time t . M_i is equal to the mCPR value for women in the selected parity groups for the same surveys used at time t . The time $t1$ refers to the period 1990–94 (or 1995–99 if the earlier period is not available) and $t2$ refers to the period 2010–14. The resulting values are then used to determine the entire change in mCPR over the given period, and is allocated to percentage due to parity distribution change and percentage due to actual mCPR rate change. Note that the Madagascar value for $t2$ is from 2005–09 as there was no survey available for the 2010–14 period; the Ethiopia and Lesotho values for $t1$ are from 2000–04 because no earlier surveys are available.

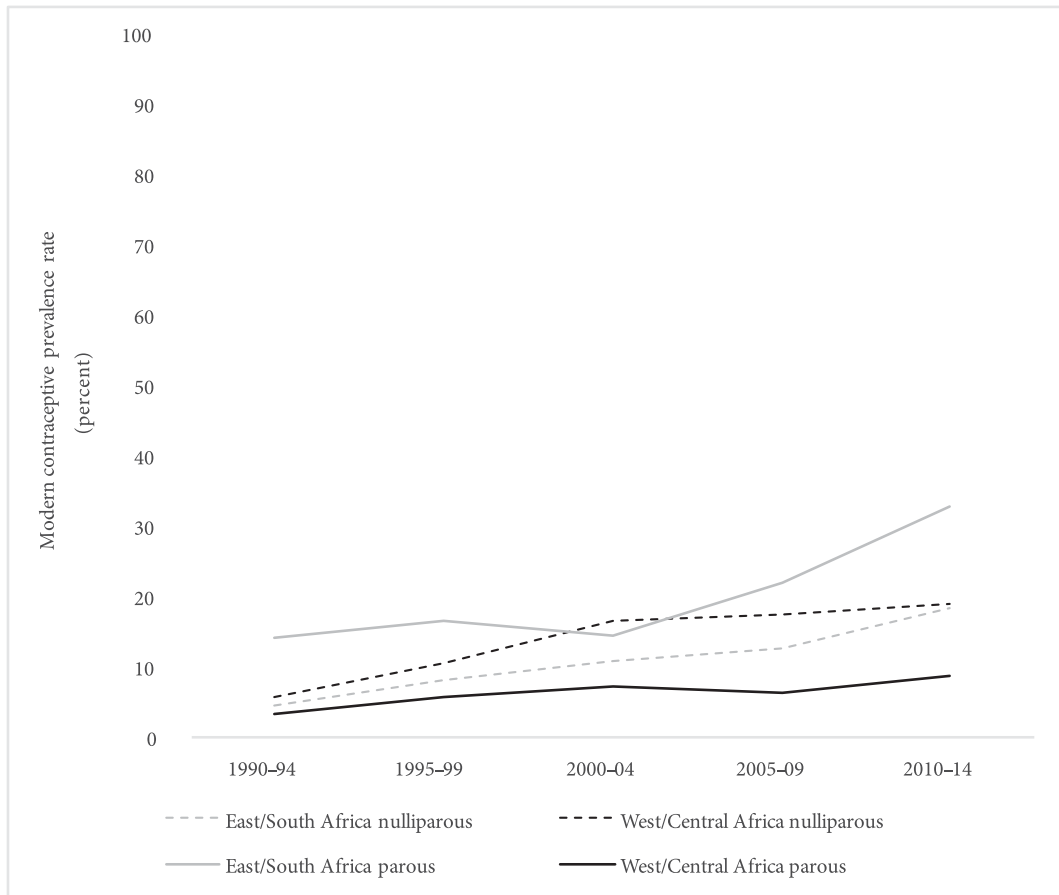
RESULTS

Trends in Young Adult Women's Use of Modern Contraceptive Methods

Figure 1 shows the mCPR by parity status for both regions. In the East/South Africa region, levels of modern contraceptive use are higher for young parous women than young nulliparous women, whereas in the West/Central Africa region, levels of modern contraceptive use are higher for young nulliparous women than young parous women. In the East/South region, modern contraceptive use increased from 5 percent in the first period (1990–94) to 18 percent in the last period (2010–14) for young nulliparous women, and from 14 percent in the first period (1990–94) to 33 percent in the last period (2010–14) for young parous women. In the West/Central region, modern contraceptive use increased from 6 percent in the first period (1990–94) to 19 percent in the last period (2010–14) for young nulliparous women, and from 3 percent in the first period (1990–94) to 9 percent in the last period (2010–14) for young parous women.

The higher observed modern contraceptive use for nulliparous women in the West/Central region is consistent with literature showing that contraceptive use is higher among young unmarried women than young married women in this region (Cleland, Ali, and Shah 2006; Blanc et al. 2009; Tsui, Brown, and Li 2017). This distribution could be because there are higher costs to having a pregnancy for unmarried nulliparous women. For example, Clark, Koski, and Smith-Greenaway (2017) show that levels of premarital childbearing have remained low throughout the Western Sahel (although there is greater variation in premarital childbearing trends along the Western coast). Alternatively this distribution could be related to selection into early pregnancy, given that these women may be of lower socioeconomic

FIGURE 1 Modern contraceptive prevalence rate for women aged 15–24 who have ever had sex, by parity status and geographic region, sub-Saharan Africa, 1990–2014



SOURCE: Demographic and Health Surveys.

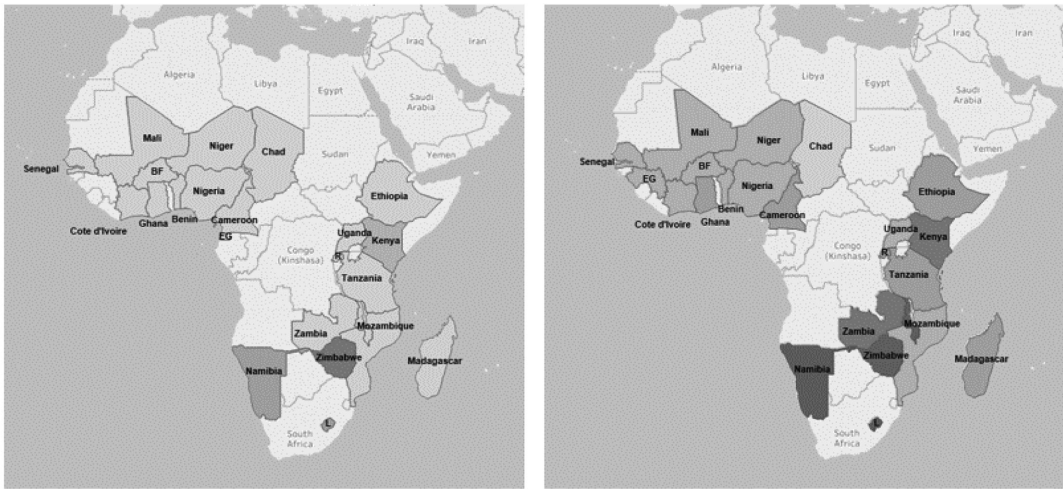
NOTES: Modern contraceptive methods include oral contraceptive pills, male and female condoms, injectables, implants, and intrauterine devices. East/South Africa includes: Ethiopia, Kenya, Lesotho, Madagascar, Malawi, Mozambique, Namibia, Rwanda, Tanzania, Uganda, Zambia, and Zimbabwe. West/Central Africa includes: Benin, Burkina Faso, Cameroon, Chad, Cote d'Ivoire, Ghana, Guinea, Mali, Niger, Nigeria, and Senegal.

status, more rural, and less likely to have used contraception in the absence of a pregnancy (Hounton et al. 2015).

To provide a sense of how modern contraceptive use varies at the country level, Figure 2 shows the modern contraceptive prevalence rate for young women aged 15–24 who have had sex in the earliest DHS survey wave after 1990 (left panel) and in 2010–14 (right panel). Although there have been increases in young women's modern contraceptive use over time, overall modern contraceptive use is low (i.e., less than 20 percent) in both the earlier and later time periods for 12 of the 23 countries.

However, there are a few clear outliers where modern contraceptive use among young adult women is much higher than the average. In Zimbabwe, modern contraceptive use among young women increased from 38 percent in the first time period to 45 percent in the last time period; in Namibia, modern contraceptive use increased from 24 percent in

FIGURE 2 Modern contraceptive prevalence rate at the country level for women aged 15–24 who have ever had sex in earliest DHS survey wave after 1990 (left) and 2010–14 (right)



Modern contraceptive prevalence rate

- <10%
- 10–19%
- 20–29%
- 30–39%
- 40–49%

SOURCE: Demographic and Health Surveys.

the first time period to 57 percent in the last time period; and in Lesotho modern contraceptive use increased from 28 percent in the first time period to 52 percent in the last time period (Appendix 3). Several other countries in the East/South region—including Malawi, Kenya, and Zambia—also experienced sizable increases in modern contraceptive use, and by 2010–14 the modern contraceptive prevalence rates were 30 percent, 38 percent, and 30 percent for these three countries, respectively. Heightened rates of modern contraceptive use in the East/South region may be driven by the comparatively high rates of HIV in these countries and concerted efforts to promote contraception to combat infection among young populations.

Table 1 shows that the annualized modern contraceptive use rate of change is positive in all 23 countries, indicating that modern contraceptive use has increased everywhere among young adult women who have had sex. Overall, change has been greater in the East/South region (0.7 percentage points annually) than in the West/Central region (0.3). There are several countries where the annualized rate of change in modern contraceptive use was particularly large (i.e., over 0.9) including Ethiopia, Kenya, Lesotho, Malawi, Namibia, and Zambia.

Consistent with regional trends described above, in the East/South region the annualized increase in modern contraceptive use is larger for parous women (0.7 percentage points annually) than for nulliparous women (0.6), whereas in West/Central Africa the annualized increase in modern contraceptive use is greater for nulliparous (0.5) than for parous women (0.2).

TABLE 1 Annualized percentage point changes for parity, modern contraception use, and unmet need among women aged 15–24 who have ever had sex, by country and geographic region, sub-Saharan Africa, 1990–2014

Country	Modern contraception use (Annualized percentage point change, 1990–2014)										Unmet need ^c (Annualized percentage point change, 1990–2014)		
	Parity ≥ 1					Parity >= 1					Nulliparous Total	Parity >= 1 Total	ALL
	Short-acting methods ^a	LARC methods ^b	Total	Short-acting methods ^a	LARC methods ^b	Total	Short-acting methods ^a	LARC methods ^b	Total				
East/South Africa	0.0	0.5	0.6	0.6	0.2	0.7	0.6	0.1	0.7	0.3	-0.2	0.0	
Ethiopia	-0.1	0.7	0.1	0.7	0.2	1.0	0.8	0.1	0.9	-0.1	-0.6	-0.4	
Kenya	-0.1	0.6	0.0	0.6	0.6	1.2	0.7	0.3	1.0	-0.1	-1.0	-0.6	
Lesotho	-0.1	0.8	0.0	0.8	0.1	1.1	0.9	0.1	1.0	0.0	-0.4	-0.3	
Madagascar	-0.1	0.3	0.0	0.3	0.0	0.9	0.7	0.0	0.7	0.7	-0.2	0.1	
Malawi	0.3	0.3	0.0	0.3	0.1	1.4	1.1	0.0	1.1	0.5	0.3	0.0	
Mozambique	0.3	0.5	0.0	0.5	0.0	0.4	0.4	0.0	0.4	0.0	-0.2	-0.3	
Namibia	-0.6	1.6	0.0	1.6	0.0	1.2	1.4	0.0	1.3	0.2	0.1	0.0	
Rwanda	-0.3	0.1	0.0	0.1	0.2	1.3	0.7	0.1	0.8	0.0	-0.5	-0.6	
Tanzania	-0.1	0.8	0.0	0.8	0.7	0.8	0.7	0.1	0.8	0.0	0.0	0.0	
Uganda	-0.3	0.2	0.0	0.2	0.1	0.6	0.5	0.0	0.5	0.0	0.0	0.0	
Zambia	0.1	0.3	0.0	0.3	0.3	1.3	0.8	0.2	1.0	0.4	0.0	-0.2	
Zimbabwe	0.5	-0.3	0.0	-0.3	0.1	0.2	0.2	0.0	0.2	0.0	-0.1	-0.1	
West/Central Africa	0.0	0.5	0.0	0.5	0.0	0.2	0.3	0.0	0.3	-0.2	0.0	0.1	
Benin	-0.1	0.5	0.0	0.5	0.0	0.1	0.3	0.0	0.3	0.2	0.1	0.2	
Burkina Faso	0.0	0.7	0.0	0.7	0.3	0.4	0.5	0.1	0.5	-0.2	0.1	0.0	
Cameroon	-0.2	1.3	0.0	1.3	0.0	0.5	0.8	0.0	0.8	0.1	0.1	0.1	
Chad	0.1	0.2	0.0	0.2	0.0	0.1	0.1	0.0	0.1	0.5	0.5	0.5	
Cote d'Ivoire	0.2	0.5	0.0	0.5	0.0	0.3	0.4	0.0	0.4	0.7	0.1	0.5	
Ghana	-0.2	0.3	0.0	0.3	0.3	0.7	0.3	0.2	0.5	0.3	0.2	0.0	
Guinea	0.1	0.3	0.0	0.3	0.0	0.0	0.1	0.0	0.1	-0.2	-0.2	0.0	
Mali	0.4	0.0	0.1	0.1	0.1	0.2	0.1	0.1	0.2	0.2	-0.1	-0.1	
Niger	0.1	0.0	0.0	0.0	0.0	0.2	0.2	0.0	0.2	-0.2	-0.1	-0.1	
Nigeria	-0.1	0.6	0.0	0.6	0.1	0.1	0.4	0.0	0.4	0.0	-0.1	-0.2	
Senegal	-0.1	0.0	0.0	0.0	0.0	0.3	0.2	0.0	0.2	0.0	0.1	0.2	

SOURCE: Demographic and Health Surveys.

^aShort-acting contraceptive methods include oral contraceptive pills, male and female condoms, and injectables.

^bLong-acting reversible contraceptive methods include implants and intrauterine devices.

^cUnmet need is estimated including both modern and traditional contraceptive methods.

TABLE 2 Modern contraceptive prevalence rate (mCPR) among nulliparous and parous women aged 15–24 who have ever had sex disaggregated by method type in East/South and West/Central Africa, 1990–2014

Survey Year	East/South Africa				West/Central Africa			
	Short-acting methods ^a		LARC methods ^b		Short-acting methods ^a		LARC methods ^b	
	mCPR nulli-parous (percent)	mCPR parous (percent)	mCPR nulli-parous (percent)	mCPR parous (percent)	mCPR nulli-parous (percent)	mCPR parous (percent)	mCPR nulli-parous (percent)	mCPR parous (percent)
1990–94	4.3	13.7	0.1	0.6	5.7	2.8	0.1	0.3
1995–99	7.7	16.1	0.4	0.6	10.5	5.6	0.1	0.2
2000–04	10.6	14.0	0.1	0.4	16.4	7.1	0.1	0.3
2005–09	12.7	21.6	0.0	0.5	17.3	6.2	0.1	0.3
2010–14	17.8	28.9	0.6	5.1	18.6	7.5	0.4	1.3

SOURCE: Demographic and Health Surveys.

NOTES: East/South Africa includes: Ethiopia, Kenya, Lesotho, Madagascar, Malawi, Mozambique, Namibia, Rwanda, Tanzania, Uganda, Zambia, and Zimbabwe. West/Central Africa includes: Benin, Burkina Faso, Cameroon, Chad, Cote d'Ivoire, Ghana, Guinea, Mali, Niger, Nigeria, and Senegal.

^aShort-acting contraceptive methods include oral contraceptive pills, male and female condoms, and injectables.

^bLong-acting reversible contraceptive (LARC) methods include implants and intrauterine devices.

Trends in Young Adult Women's Use of Short- and Long-Acting Modern Contraceptive Methods

Table 2 shows that use of LARC methods is overall very low among young adult women who have had sex in both East/South and West/Central regions. Among parous women in the East/South region, use of LARC methods was relatively stable at less than 1 percent between the 1990–94 and 2005–09 time periods. Between 2005–09 and 2010–14, however, use of LARC methods increased to 5 percent among parous women. This increase could have been driven by increased donor and governmental attention to long-acting methods in the mid-2000s (Yinger 2016). Among nulliparous women in the East/South region, use of LARC methods increased very modestly from 0.1 percent in 1990–94 to 0.6 percent in 2010–14 time periods. Higher use of LARC methods among parous compared to nulliparous women in the region could be because long-acting methods were targeted to women who had given birth in health centers (HIP 2013). Alternatively, parous women may be more likely to accept or seek out long-acting methods because they have proven their fertility and long-acting methods are considered appropriate for birth spacing.

In the West/Central region, use of LARC methods is lower than in the East/South region. However, in the West/Central region, use of LARC methods also increased among parous women starting in 2005–09, albeit at lower levels than in the East/South region (from 0.3 percent to 1.3 percent). Meanwhile, use of LARC methods among nulliparous women increased only modestly from 0.1 percent to 0.4 percent over the same period.

Table 2 also shows that short-acting contraception use is considerably more prevalent than LARC methods among all groups. The use of short-acting methods increased in the East/South region from 14 percent in 1990–94 to 29 percent in 2010–14 among parous women and from 4 percent in 1990–94 to 18 percent in 2010–14 among nulliparous women. In the West/Central region, short-acting methods increased from 3 percent in 1990–94 to 8 percent in 2010–14 among parous women and from 6 percent in 1990–94 to 19 percent in 2010–14 among nulliparous women. Thus, consistent with the general trends in

modern contraceptive use, in the East/South Africa region, use of short-acting methods is higher among parous women than nulliparous women, whereas in the West/Central region the use of short-acting methods is higher among nulliparous women.

Table 1 shows that most of the overall increase in modern contraceptive use among young women who have had sex is driven by increases in short-term methods across regions and parity groups. In the East/South region the annualized percentage point change for short-term methods is 0.5 for nulliparous women and 0.6 for parous women, whereas the annualized change for LARC methods is 0.0 for nulliparous women and 0.2 for parous women. In West/Central Africa, the annualized percentage point change for short-term methods is 0.5 for nulliparous women and 0.2 for parous women, and the annualized change for LARC methods is 0.0 for both groups. The annualized percentage point change for short-term methods was positive and non-zero for parous women in 20 countries and for nulliparous women in 19 of the 23 countries, which indicates overall large increases in women using short-acting methods. The exceptions to this trend are Zimbabwe, where the annualized change for short-acting methods is negative (-0.3) for nulliparous women; Mali, Niger, and Senegal, where the annualized rate of change is neutral (0.0) for nulliparous women; and Benin, Chad, and Guinea, where the annualized rate of change is neutral (0.0) for parous women.

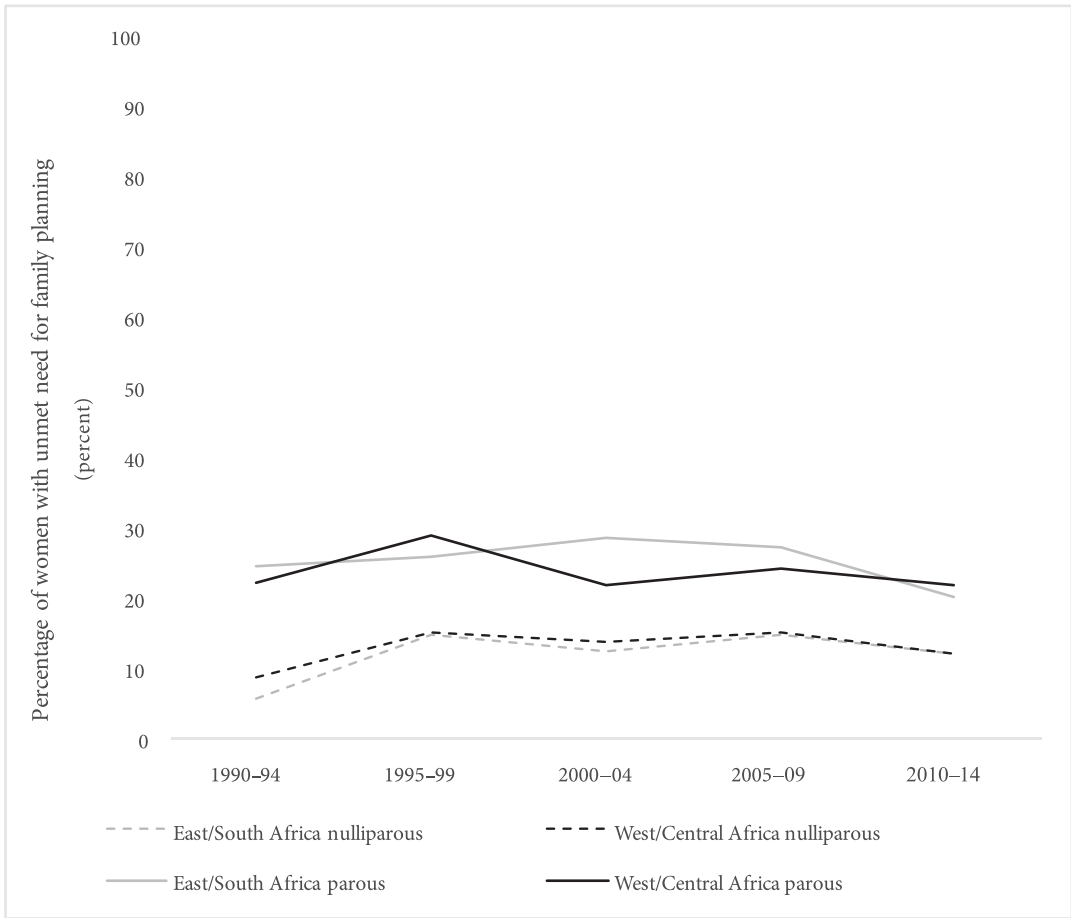
Trends in Young Adult Women's Unmet Need for Family Planning

Figure 3 shows that in both regions unmet need for family planning is higher among parous women than among nulliparous women. In East/South Africa, unmet need for family planning among parous women started at 24 percent in 1990–94, and increased to 29 percent by 2000–04, before eventually decreasing to 20 percent by 2010–14. In West/Central Africa, unmet need for family planning among parous women started at 22 percent in 1990–94, and increased to 29 percent by 1995–99, before eventually decreasing back to 22 percent by 2000–04. Unmet need for family planning for nulliparous women rose from 6 percent and 9 percent, respectively, in East/South and West/Central in 1990–94 to 15 percent in 1995–99 in both regions. Unmet need for family planning remained relatively stable for nulliparous women and decreased to 12 percent by 2010–14 in both regions.

Table 1 shows that the annualized percentage point change for unmet need for family planning remained stable over the period 1990–2014 in the East/South region (0.0) and increased slightly in the West/Central region (0.1). However, these aggregate level trends mask country-level heterogeneity; the annualized rate of change for unmet need for family planning fell in many countries including Ethiopia, Kenya, Lesotho, Mali, Mozambique, Niger, Nigeria, Rwanda, Zambia, and Zimbabwe.

Furthermore, there are distinct trends in changes in unmet need for family planning depending on parity. In East/South Africa, the annualized percentage point change of unmet need for family planning was positive for nulliparous women (0.3) and negative for parous women (-0.2). In West/Central Africa, the annualized percentage point change of unmet need for family planning was negative for nulliparous women (-0.2), but stable among parous women (0.0). This suggests that at the aggregate level, unmet need increased more among nulliparous women than parous women in the East/South region—which may be related to the

FIGURE 3 Percentage of women with unmet need for family planning disaggregated by parity status among women aged 15–24 who have ever had sex in East/South and West/Central Africa, 1990–2014



SOURCE: Demographic and Health Surveys.

NOTES: Unmet need estimates include both modern and traditional contraceptive methods. East/South Africa includes Ethiopia, Kenya, Lesotho, Madagascar, Malawi, Mozambique, Namibia, Rwanda, Tanzania, Uganda, Zambia, and Zimbabwe. West/Central Africa includes Benin, Burkina Faso, Cameroon, Chad, Cote d’Ivoire, Ghana, Guinea, Mali, Niger, Nigeria, and Senegal.

targeting of family planning initiatives to women who have already initiated childbearing—although the opposite is true in the West/Central region.

Assessing the Role of Compositional Changes: Trends in Young Adult Women’s Sexual Activity and Parity Status and Decomposition Analysis

Observed increases in young adult women’s use of modern contraceptives could be due to an increase in the rate of modern contraceptive use, but they also could be due to changes in the composition of the population of young adult women who have had children, particularly given that modern contraceptive use varies depending on parity status.

TABLE 3 Percentage of all women aged 15–24 who have ever had sex, and percentage of sexually experienced women aged 15–24 who have had at least one live birth, 1990–2014

Survey Year	East/South Africa		West/Central Africa	
	Ever had sex (percent)	Of women who ever had sex: Have at least 1 child (percent)	Ever had sex (percent)	Of women who ever had sex: Have at least 1 child (percent)
1990–94	62.8	63.7	74.9	59.3
1995–99	70.8	62.3	72.2	59.4
2000–04	64.2	66.5	68.1	57.0
2005–09	56.5	67.0	65.6	57.0
2010–14	59.1	64.2	66.8	59.7

SOURCE: Demographic and Health Surveys.

NOTES: East/South Africa includes Ethiopia, Kenya, Lesotho, Madagascar, Malawi, Mozambique, Namibia, Rwanda, Tanzania, Uganda, Zambia, and Zimbabwe. West/Central Africa includes Benin, Burkina Faso, Cameroon, Chad, Cote d'Ivoire, Ghana, Guinea, Mali, Niger, Nigeria, and Senegal.

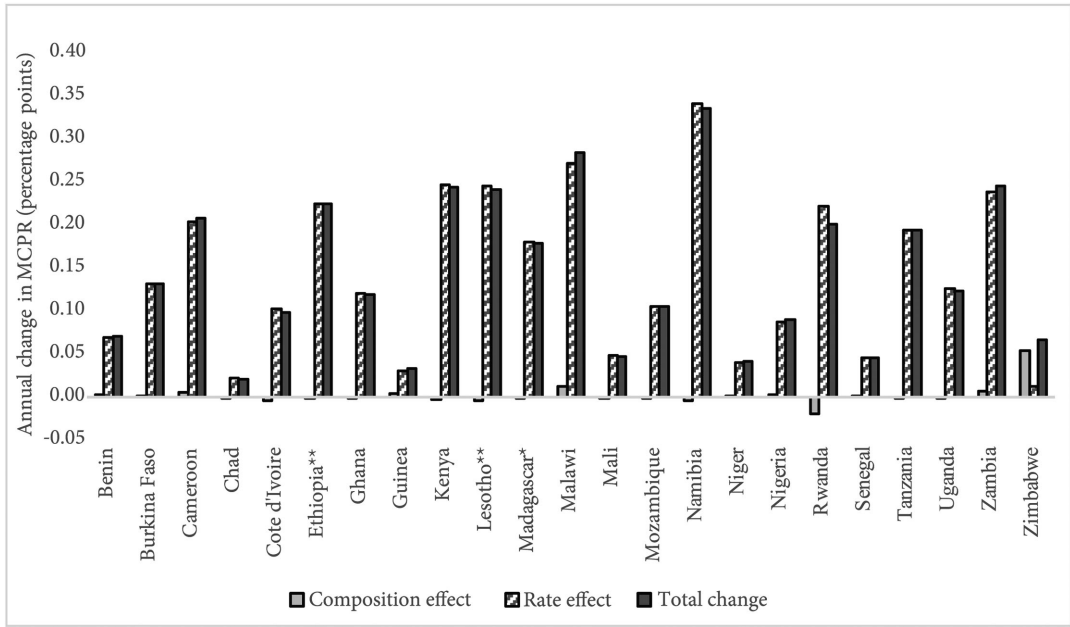
To better understand these issues, we first present descriptive information about trends in sexual initiation and first birth among young adult women in Africa. Table 3 shows that the majority of young adult women aged 15–24 in both the East/South and West/Central regions have had sex. Nonetheless, in both regions there were declines over time in the percentage of young women who have had sex. In the East/South region, the percentage of women aged 15–24 who had sex fell from 63 percent in 1990–94 to 59 percent in 2010–14. In the West/Central region, the percentage of women aged 15–24 who had ever had sex fell from 75 percent in 1990–94 to 67 percent in 2010–14. This decline in the percentage of young women who ever had sex corresponds with the rising mean age at first sex identified by Bongaarts, Mensch, and Blanc (2017), a pattern that was driven by increased educational attainment.

Table 3 also shows how the percentage of women who ever had sex between the ages of 15 and 24 who have initiated childbearing (i.e., had at least one live birth) changed over time in both regions. In both regions, the percentage of sexually experienced women aged 15–24 who had at least one child remained relatively stable between 1990–94 and 2010–14, ranging 62–67 percent in East/South Africa and 57–60 percent in West/Central Africa.

Thus, Table 3, combined with the results presented in Figure 1 about mCPR, show a potentially paradoxical trend: among young adult women who have ever had sex, modern contraception increased while the percentage who have had a live birth remained stable in both regions. Although these patterns may appear incompatible, it is important to remember that by the 2010–14 period less than one-fifth of sexually active nulliparous women were using modern contraception (Figure 1). Given the low level of contraceptive use in this population, contraceptive use could increase and still correspond to minimal change in the proportion of women who had at least one child. The overall pattern in the East/South region is also consistent with the observed greater increases in contraceptive use among parous women than nulliparous women, which would increase overall contraceptive prevalence but have no impact on the prevalence of women who have ever given birth.

To better understand changes in parity over time, Table 1 presents the annualized parity percentage point change for young adult women at both the regional and country levels. In 13 of the 23 countries in the study the annualized parity percentage point change is negative, which indicates declines in the prevalence of initiation of childbearing among young adult women in these countries in contrast to aggregate level trends. Countries with a

FIGURE 4 Decomposition of change in modern contraceptive use between 1990 and 1994 and 2010–2014, women aged 15–24 who have ever had sex, by country, sub-Saharan Africa



SOURCE: Demographic and Health Surveys.

NOTES: Modern contraceptive methods include oral contraceptive pills, male and female condoms, injectables, implants, and intrauterine devices. *Later period (t2) values are for 2005–09. **Earlier period (t1) values are for 2000–04.

negative annualized parity percentage point change can be found in both the East/South region (Ethiopia, Kenya, Lesotho, Madagascar, Namibia, Rwanda, Tanzania, and Uganda) and the West/Central region (Benin, Cameroon, Ghana, Nigeria, and Senegal). However, at the aggregate level the parity rate of change is neutral (0.0) in both regions.

To better understand the interplay of the changing composition of nulliparous versus parous women on the increase in modern contraceptive use over the 1990–2014 period, we conduct a decomposition analysis at the country level to estimate the relative contribution of changes in parity distribution versus changes in the modern contraceptive use rate within parity categories to the overall change in modern contraceptive use. The results of the decomposition are shown in Figure 4. The decomposition indicates that more than 90 percent of change in modern contraceptive use is attributable to an increase in the rates of modern contraception use within parity groups in 22 of the 23 countries in the analysis. The exception to this trend is Zimbabwe, where the change in mCPR is primarily attributable to changes in the parity distribution. In Zimbabwe, changes in the composition of parity distribution contributed to a 5.4 percentage point increase in mCPR over the 1990 to 2014 period. When combined with the contribution of the mCPR rate change over this period (1.2 percentage points), the total effect is a 6.6 percentage point increase. The only other country where parity composition change could be considered relatively important was in Rwanda—changes in composition of parity contributed to a 2.0 percentage point decrease in mCPR; when

combined with the rate effect (22.1 percentage points), it yields a total effect of 20.1 percentage points.

Seven of the countries included in our sample increased their modern contraceptive prevalence rate by more than 400 percent over the 1990 to 2014 period (Burkina Faso, Cameroon, Ethiopia, Malawi, Madagascar, Tanzania, and Zambia). (Supplemental calculations based on Appendix 3, available upon request.) These countries are very similar in terms of their decomposition analysis components—the composition effect is essentially zero, with the within parity group rate effect driving the total change over time (Figure 4). These seven countries all started the analytic period with an mCPR between 1 percent and 6 percent, and by 2010–14 all had an mCPR between 16 percent and 30 percent (Appendix 3). In terms of absolute percentage point increase, eight countries experienced a 20-percentage point (or greater) increase in mCPR from 1990 to 2014; five of these countries are also in the 400 percent or greater increase category (Cameroon, Ethiopia, Malawi, Tanzania, and Zambia). The two countries that experienced a greater than 400 percent increase but not a 20 percentage point increase, Burkina Faso and Madagascar, started at extremely low levels of mCPR—Burkina Faso reported an mCPR of 3.7 percent in 1993 and Madagascar reported 1.7 percent in 1992.

Supplementary Analyses

Because we do not have data for every country at every time period, one concern is that larger countries that do not have data for the complete time series will distort regional trends. This is particularly the case for Ethiopia, which has a large sample size, a large increase in mCPR relatively quickly (between 2000 and 2014), and no available data in the earliest two time periods. To partially account for this, we conduct our decomposition at the country level, and provide country-level estimates of all relevant trends. In addition, we conducted supplementary analyses where we excluded Ethiopia from the aggregated regional estimates (available upon request). We find that excluding Ethiopia does not substantively change the estimates of levels of mCPR or the mCPR annualized estimates (though the results of the latter are attenuated toward zero). Leaving out Ethiopia also does not alter the substantive trend of parous women having larger increases in short-acting contraceptive use than nulliparous women in the East/South region, although, once again, results are somewhat attenuated, particularly in the later time periods. However, excluding Ethiopia does have implications for changes in unmet need for family planning. Because Ethiopia had a larger than average decrease in unmet need for parous women and smaller than average increase in unmet need among nulliparous women over the available study periods, the aggregated annualized percentage point change in unmet need reduces from neutral (0.0) to negative (–.3) for the East/South region.

An additional concern is whether there is misclassification of modern contraceptive use and/or misreporting of contraceptive use. To provide a crude assessment of potential misreporting we cross-tabulate reports of condom use at last sex and reports of use of modern methods to provide a sense of the prevalence of women who report using condoms at last sex but not using modern contraceptive methods (Appendix 4). We also cross-tabulate reports of consistent condom use (i.e., using a condom every time the respondent had sex with the person she last had sex with in the last 12 months) and reports of use of modern methods.

These analyses are particularly relevant since condoms are a principal form of contraception used by respondents in our sample. Nonetheless, these results should be interpreted with the caveat that variables are not available in all surveys or rounds.

Overall the prevalence of women who report that they do not use modern contraceptives but they did use condoms at last sex ranges from an average of 3.9 percent in 1995/1999 to 9.6 percent in 2010/2014 (Appendix 4). The prevalence of women who report that they do not use modern contraceptives but they did consistently use condoms over the last 12 months is lower at an average of 4.8 percent in 2005/2009 and 5.3 percent in 2010/2014 (Appendix 4). The only two countries with over 10 percent reporting that they do not use modern contraceptives but they do consistently use condoms are Namibia and Lesotho. Taken together, results suggest that there may be some bias in reports of modern contraceptive use, although it is not possible to ascertain if women are misrepresenting modern contraceptive use or consistent condom use.

DISCUSSION

This article contributes to a growing scholarship on the reproductive health needs of African adolescent and youth populations. Our analyses suggest that there have been overall increases in modern contraceptive use among young women (aged 15–24) who have had sex across regions and parity groups in the 23 sub-Saharan African countries in our study. The decomposition analysis indicated that the country-level increases were predominantly due to changes in contraception rates within parity groups rather than changes in the parity distribution of women in all but one of the countries (Zimbabwe).

In contrast to many prior studies that examined how contraceptive use varied by marital status, we disaggregated all analyses by parity status because parous and nulliparous women often have differential access to reproductive health services and differential reproductive health needs. We found heterogeneity in modern contraception trends depending on region and parity status. In the West/Central region nulliparous women had higher modern contraceptive use than parous women in the first period and larger increases in modern contraceptive use over time. By the last period (2010–14), nulliparous women's use of modern contraception methods was over 10 percentage points higher than that of parous women in the West/Central region. This could be because there are higher costs to having a pregnancy for nulliparous women who are not married (Tsui, Brown, and Li 2017). Alternatively this could have to do with who selects into an early pregnancy, given that these women may be of lower socioeconomic status, more rural, and less likely to have used contraception in the absence of a pregnancy (Hounton et al. 2015).

On the other hand, in East/South Africa, parous women had higher modern contraceptive use than nulliparous women in the first period and larger increases in modern contraceptive use over time. By the last period (2010–14), modern contraception use was 14 percentage points higher for parous women than nulliparous women in the East/South region. Higher observed contraceptive use for parous women in this region could be because service providers do not believe in premarital sex or contraceptive use for nulliparous women (Rivera et al. 2001; Bankole and Malarcher 2010). Alternatively, young women may

encounter formal health-care facilities and reproductive services for the first time in the period during pregnancy or after a first birth (Reynolds, Wong, and Tucker 2006).

The regional differences in modern contraceptive use by parity could also reflect differential norms regarding premarital sexual activity and childbearing. For example, the prevalence of premarital childbearing is increasing in East and Southern Africa and remains higher than in Western and Central Africa (Clark, Koski, and Smith-Greenaway 2017). Women in the West/Central region may face a greater penalty for having a child prior to marriage, and thus nulliparous women may more actively try to avoid childbearing by using modern contraception (Blanc et al. 2009). There also may be regional differences in norms about how soon to have a child following marriage (Rivera et al. 2001; Marston and King 2006). Given that premarital childbearing is on average lower in the West/Central region, women may be expected to initiate childbearing soon after entering a union leading partnered women to discontinue contraceptive use.

Our analyses also revealed that most of the increase in modern contraceptive use among women who have had sex was by increases in short-acting methods across regions and parity groups. Only parous women in the East/South region experienced a substantial increase in long-acting reversible method use, and even then, LARC use remained very low (around 5 percent). Although short-acting methods increased over time across all groups, there were regional trends in the prevalence of short-acting methods by parity. In the East/South Africa region, the use of short-acting methods was higher among parous women than nulliparous women, whereas in the West/Central region short-acting methods were more prevalent among nulliparous women than parous women. Our analysis of unmet need for family planning demonstrates that although unmet need for family planning was higher among parous women in both regions, there were distinct regional trends by parity. Unmet need increased among nulliparous women, but decreased among parous women in the East/South region; however, unmet need decreased among nulliparous women, but remained stable among parous women in the West/Central region.

These patterns also raise important questions about whether increased educational attainment among women in the region has affected the pattern of contraceptive use. Bongaarts, Mensch, and Blanc (2017) found that educational expansion has driven the increasing age at first birth in sub-Saharan Africa, yet we find that this shifting parity distribution did not play an important role in increased contraceptive use over time. Given that youth contraceptive use is highly stratified by education in sub-Saharan Africa (Lloyd 2005), educational expansion may be associated with changes in contraceptive use via mechanisms other than the parity distribution. Although these questions are beyond the scope of this article, they are an important area for future research.

Our study had several limitations. First, we do not have country-level data for every time period and some countries have more complete information than others: only three countries had DHS data available for all five time periods. This distribution could be problematic if countries that do not have data across the entire time series distort regional trends. To partially address these concerns, we conduct our decomposition analysis at the country level and provide country-level estimates of all trends. We also conducted a supplementary analysis where we excluded Ethiopia, a country with a large population and no data in the earliest time periods, from the aggregate analyses. A further limitation is that there might have been

misclassification of modern contraceptive use and/or misreporting of contraceptive use. For example, our supplementary descriptive analyses suggested there were some discrepancies between women reporting that they did not use modern contraceptives, but did use condoms at last sex and/or consistently in the last 12 months.

A related limitation is that the regions differ in their degree of completeness over time. Other than for the last period (2010–14), there are more countries with no available data in the earlier period for East/South Africa and in the later period for West/Central Africa. We also do not have data on all sub-Saharan African countries, thus should not generalize findings beyond the subsample of countries included in this analysis. The East and West regions are much better represented in the DHS than the South and Central regions where we have comparatively fewer countries. This is relevant because countries in the South region are on average richer and countries in the Central region are on average poorer, thus trends might look quite different if more data were available for these regions.

Taken together, the results of our analysis show the importance of focusing on the unique reproductive health needs of young adult African women, many of whom have not yet initiated childbearing. Although it is promising that modern contraceptive use increased among all populations, use of long-acting reversible contraceptive methods is still very low among young adult African women. Consistent and continuous use of contraceptive methods can be easier when women use long-acting reversible methods, as these have higher efficacy and mitigate issues related to access and availability that young women in sub-Saharan Africa often face. Addressing key issues related to access and discrimination for young adults seeking long-acting methods can help to ensure increased use of these methods. Parous and nulliparous young adult African women may have distinct reproductive health needs that may require differential targeting of family planning efforts (including long-acting reversible methods). Further research and policy work is needed to better understand and address the reproductive health needs of young adult African women of diverse backgrounds.

REFERENCES

- Bankole, Akinrinola, Fatima H. Ahmed, Stella Neema, Christine Ouedraogo, and Sidon Konyani. 2007. "Knowledge of correct condom use and consistency of use among adolescents in four countries in sub-Saharan Africa," *African Journal of Reproductive Health* 11(3): 197–220. <https://doi.org/10.2307/25549740>.
- Bankole, Akinrinola and Shawn Malarcher. 2010. "Removing barriers to adolescents' access to contraceptive information and services," *Studies in Family Planning* 41(2): 117–124. <https://doi.org/10.1111/j.1728-4465.2010.00232.x>.
- Bearinger, Linda H., Renee E. Sieving, Jane Ferguson, and Vinit Sharma. 2007. "Global perspectives on the sexual and reproductive health of adolescents: Patterns, prevention, and potential," *The Lancet* 369(9568): 1220–1231. [https://doi.org/10.1016/S0140-6736\(07\)60367-5](https://doi.org/10.1016/S0140-6736(07)60367-5).
- Biddlecom, Ann, Richard Gregory, Cynthia B. Lloyd, and Barbara S. Mensch. 2008. "Associations between premarital sex and leaving school in four sub-Saharan African countries," *Studies in Family Planning* 39(4): 337–350.
- Biddlecom, Ann E., Susheela Singh, and Alister Munthali. 2007. "Adolescents' views of and preferences for sexual and reproductive health services in Burkina Faso, Ghana, Malawi and Uganda," *African Journal of Reproductive Health* 11(3): 99–110. Women's Health and Action Research Centre.
- Blanc, Ann K., Amy O. Tsui, Trevor N. Croft, and Jamie L. Trevitt. 2009. "Patterns and trends in adolescents' contraceptive use and discontinuation in developing countries and comparisons with adult women," *International Perspectives on Sexual and Reproductive Health* 35(2): 63–71. <https://doi.org/10.1363/3506309>.

- Bledsoe, Caroline. 1990. "Transformations in Sub-Saharan African marriage and fertility," *The ANNALS of the American Academy of Political and Social Science* 510(1): 115–125. <https://doi.org/10.1177/0002716290510001009>.
- Bledsoe, Caroline H. and Gilles Pison. 1994. *Nuptiality in Sub-Saharan Africa*. New York: Oxford University Press.
- Bongaarts, John. 2016. "Africa's unique fertility transition," John B. Casterline and John Bongaarts (eds.), *Population and Development Review* 43(1): 39–58. <https://doi.org/10.1111/j.1728-4457.2016.00164.x>.
- Bongaarts, John and John Casterline. 2013. "Fertility transition: Is sub-Saharan Africa different?" *Population and Development Review* 38(S1): 153–168. <https://doi.org/10.1111/j.1728-4457.2013.00557.x>.
- Bongaarts, John, Barbara S. Mensch, and Ann K. Blanc. 2017. "Trends in the age at reproductive transitions in the developing world: The role of education," *Population Studies* 13(25): 1–16. <https://doi.org/10.1080/00324728.2017.1291986>.
- Bradley, Sarah E.K., Trevor N. Croft, Joy D. Fishel, and Charles F. Westoff. 2012. "Revising unmet need for family planning." DHS Analytical Studies No. 25. Calverton, Maryland: ICF International.
- Castañeda, Xóchitl, Claire Brindis, and Itzá Castañeda Camey. 2010. "Nebulous margins: Sexuality and social constructions of risks in rural areas of central Mexico," *Culture, Health & Sexuality* 3(2): 203–219. <https://doi.org/10.1080/136910501750153021>.
- Chandra-Mouli, Venkatraman, Donna R. McCarraher, Sharon J. Phillips, Nancy E. Williamson, and Gwyn Hainsworth. 2014. "Contraception for adolescents in low and middle income countries: Needs, barriers, and access," *Reproductive Health* 11(1): 1–8. <https://doi.org/10.1186/1742-4755-11-1>.
- Clark, Shelley, Alissa Koski, and Emily Smith-Greenaway. 2017. "Recent trends in premarital fertility across sub-Saharan Africa," *Studies in Family Planning* 48(1): 3–22. <https://doi.org/10.1111/sifp.12013>.
- Cleland, John and Mohamed M. Ali. 2006. "Sexual abstinence, contraception, and condom use by young African women: A secondary analysis of survey data," *The Lancet* 368(9549): 1788–1793. [https://doi.org/10.1016/S0140-6736\(06\)69738-9](https://doi.org/10.1016/S0140-6736(06)69738-9).
- Cleland, John, Mohamed M. Ali, and Iqbal Shah. 2006. "Trends in protective behaviour among single vs. married young women in Sub-Saharan Africa: The Big Picture," *Reproductive Health Matters* 14(28): 17–22. [https://doi.org/10.1016/S0968-8080\(06\)28250-8](https://doi.org/10.1016/S0968-8080(06)28250-8).
- Cleland, John G., Robert P. Ndugwa, and Eliya M. Zulu. 2011. "Family Planning in Sub-Saharan Africa: Progress or Stagnation?" *Bulletin of the World Health Organization* 89(2): 137–143. <https://doi.org/10.2471/blt.10.077925>.
- Do, Mai and Nami Kurimoto. 2012. "Women's empowerment and choice of contraceptive methods in selected African countries," *International Perspectives on Sexual and Reproductive Health* 38(1): 23–33. <https://doi.org/10.1363/3802312>.
- Gebreselassie, T., Kristin Bietsch, Sarah Staveteig, and Thomas Pullum. 2017. "Trends, Determinants, and Dynamics of Traditional Contraceptive Method Use." DHS Analytical Studies No. 63. Rockville, Maryland.
- HIP. 2013. "Family Planning and Immunization Integration: Reaching Postpartum Women with Family Planning Services." *High Impact Practices in Family Planning (HIP) Research Briefs*. Washington, DC: USAID.
- . 2015. "Adolescent-Friendly Contraceptive Services: Maintaining Adolescent-Friendly Elements into Existing Contraceptive Services." *High Impact Practices in Family Planning (HIP) Research Briefs*. Washington, DC: USAID.
- . 2017. "Immediate Postpartum Family Planning: A Key Component of Childbirth Care." *High Impact Practices in Family Planning (HIP) Research Briefs*. Washington, DC: USAID.
- Hounton, Sennen, Aluisio J. D. Barros, Agbessi Amouzou, Solomon Shiferaw, Abdoulaye Maïga, Akanni Akinyemi, Howard Friedman, and Desmond Koroma. 2015. "Patterns and trends of contraceptive use among sexually active adolescents in Burkina Faso, Ethiopia, and Nigeria: Evidence from Cross-Sectional Studies" *Global Health Action* 8(1): 1–11. <https://doi.org/10.3402/gha.v8.29737>.
- Johnson-Hanks, Jennifer. 2006. *Uncertain Honor: Modern Motherhood in an African Crisis*. Chicago, Illinois: University of Chicago Press.
- Lloyd, Cynthia. 2005. *Growing Up Global: The Changing Transitions to Adulthood in Developing Countries*, (ed.) Cynthia Lloyd. Washington, DC: National Academies Press. <https://doi.org/10.17226/11174>.
- MacQuarrie, Kerry L.D. 2014. "Unmet Need for Family Planning Among Young Women: Levels and Trends [CR34]." Rockville, Maryland.

- Marston, Cicely and Eleanor King. 2006. "Factors that shape young people's sexual behaviour: A systematic review," *The Lancet* 368(9547): 1581–1586. [https://doi.org/10.1016/s0140-6736\(06\)69662-1](https://doi.org/10.1016/s0140-6736(06)69662-1).
- May, John F. 2017. "The politics of family planning policies and programs in sub-Saharan Africa." John B. Casterline and John Bongaarts (eds.), *Population and Development Review* 43(S1): 308–329. <https://doi.org/10.1111/j.1728-4457.2016.00165.x>.
- Mbacké, Cheikh. 2017. "The persistence of high fertility in sub-Saharan Africa: A Comment." John B. Casterline and John Bongaarts (eds.), *Population and Development Review* 43(3): 330–337. <https://doi.org/10.1111/padr.12052>.
- Meekers, Dominique. 1992. "The process of marriage in African societies: A multiple indicator approach" *Population and Development Review* 18(1): 61–78. <https://doi.org/10.2307/1971859>.
- Mensch, Barbara S., Monica J. Grant, and Ann K. Blanc. 2006. "The changing context of sexual initiation in sub-Saharan Africa," *Population and Development Review* 32(4): 699–727. <https://doi.org/10.1111/j.1728-4457.2006.00147.x>.
- Nalwadda, Gorrette, Florence Mirembe, Nazarius M. Tumwesigye, Josaphat Byamugisha, and Elisabeth Faxelid. 2011. "Constraints and prospects for contraceptive service provision to young people in Uganda: Providers' perspectives," *BMC Health Services Research* 11(1): 1–9. <https://doi.org/10.1186/1472-6963-11-220>.
- Performance Monitoring and Accountability (PMA) 2020 Indicators. 2017. *Glossary of Family Planning Indicators*. Baltimore, MD: Johns Hopkins Bloomberg School of Public Health. <https://www.pma2020.org/glossary-family-planning-indicators>.
- Peters, David H., Anu Garg, Gerry Bloom, Damian G. Walker, William R. Brieger, and M. Hafizur Rahman. 2008. "Poverty and access to health care in developing countries," *Annals of the New York Academy of Sciences* 1136(1): 161–171. Blackwell Publishing. <https://doi.org/10.1196/annals.1425.011>.
- Prata, Ndola, Karen Weidert, and Amita Sreenivas. 2013. "Meeting the need: Youth and family planning in Sub-Saharan Africa," *Contraception* 88(1): 83–90. <https://doi.org/10.1016/j.contraception.2012.10.001>.
- Preston, Samuel, Patrick Heuveline, and Michel Guillot. 2000. *Demography*. Wiley-Blackwell.
- Radovich, Emma, Mardieh L. Dennis, Kerry L.M. Wong, Moazzam Ali, Caroline A. Lynch, John Cleland, Onikepe Owolabi, Mark Lyons-Amos, and Lenka Benova. 2018. "Who meets the contraceptive needs of young women in Sub-Saharan Africa?" *Journal of Adolescent Health* 62(3): 273–280. <https://doi.org/10.1016/j.jadohealth.2017.09.013>.
- Reynolds, Heidi W., Emelita L. Wong, and Heidi Tucker. 2006. "Adolescents' use of maternal and child health services in developing countries," *International Family Planning Perspectives* 32(1): 6–16. <https://doi.org/10.1363/3200606>.
- Richter, M.S. and G.T. Mlambo. 2005. "Perceptions of rural teenagers on teenage pregnancy: Research," *Health SA Gesondheid* 10(2): 61–69.
- Rivera, R., M. Cabral de Mello, S.L. Johnson, and V. Chandra Mouli. 2001. "Contraception for adolescents: Social, clinical and service-delivery considerations," *International Journal of Gynecology & Obstetrics* 75(2): 149–163. Wiley-Blackwell. [https://doi.org/10.1016/S0020-7292\(01\)00371-X](https://doi.org/10.1016/S0020-7292(01)00371-X).
- Rossier, Clémentine and Jamaica Corker. 2017. "Contemporary use of traditional contraception in Sub-Saharan Africa." John B. Casterline and John Bongaarts (eds.), *Population and Development Review* 43(2): 192–215. <https://doi.org/10.1111/padr.12008>.
- Santhya, K.G. and Shireen J. Jejeebhoy. 2015. "Sexual and reproductive health and rights of adolescent girls: Evidence from low- and middle-income countries," *Global Public Health* 10(2): 189–221. Taylor & Francis. <https://doi.org/10.1080/17441692.2014.986169>.
- Tavory, Iddo and Ann Swidler. 2009. "Condom semiotics: Meaning and condom use in rural Malawi," *American Sociological Review* 74(2): 171–189. <https://doi.org/10.1177/000312240907400201>.
- Tsui, Amy O., Win Brown, and Qingfeng Li. 2017. "Contraceptive practice in Sub-Saharan Africa," *Population and Development Review* 3(7): 166–191. <https://doi.org/10.1111/padr.12051>.
- Tumlinson, K., C. Okigbo, and I. Speizer. 2014. "Provider barriers to family planning access in urban Kenya," *Contraception* 90(3): 143–151. <https://doi.org/10.1016/j.contraception.2014.05.085>.
- van de Walle, Etienne. 1965. "The relation of marriage to fertility in African demographic inquiries," *Demography* 2(1): 302–308. <https://doi.org/10.2307/2060120>.
- Williamson, Lisa M., Alison Parkes, Daniel Wight, Mark Petticrew, and Graham J. Hart. 2009. "Limits to modern contraceptive use among young women in developing countries: A systematic review of qualitative research," *Reproductive Health* 6(1): 1–12. <https://doi.org/10.1186/1742-4755-6-3>.

- Wood, Kate and Rachel Jewkes. 2006. "Blood blockages and scolding nurses: Barriers to adolescent contraceptive use in South Africa," *Reproductive Health Matters* 14(27): 109–118. [https://doi.org/10.1016/S0968-8080\(06\)27231-8](https://doi.org/10.1016/S0968-8080(06)27231-8).
- Wright, Kelsey, Vicky Boydell, Lawrence Muhungi, Nanono Nulu, Gemma Ahaibwe, Sheila Depio, and Karen Hardee. 2017. "Measuring Rights-Based Family Planning Service Delivery: Evidence from Health Facilities in Uganda." Paper presented at IUSSP, Cape Town, 31 October 2017.
- Yinger, Nancy. 2016. "Meeting the Need, Fulfilling the Promise: Youth and Long-Acting Reversible Contraceptives." Policy Brief. Washington, DC: Population Reference Bureau.

ACKNOWLEDGMENTS

We are grateful to Monica Caudillo and Abigail Weitzman for helpful comments on an earlier version of this paper.

Appendix 1: List of countries and DHS survey years

Region	Country	1990–94 Wave, survey year	1995–99 Wave, survey year	2000–04 Wave, survey year	2005–09 Wave, survey year	2010–14 Wave, survey year
East/South Africa	Ethiopia	–	–	2000	2005	2011
	Kenya	1993	1998	2003	2008	2014
	Lesotho	–	–	2004	2009	2014
	Madagascar	1992	1997	2003	2008	–
	Malawi	1992	–	2000 ^a	–	2010 ^a
	Mozambique	–	1997	2003	–	2011
	Namibia	1992	–	2000	2006	2013
	Rwanda	1992	–	2000	2005	2010 ^a
	Tanzania	1991	1996 ^a	2004	–	2010 ^a
	Uganda	–	1995	2000	2006	2011
	Zambia	1992	1996	2001	2007	2013
	Zimbabwe	1994	1999	–	2005	2010
	West/Central Africa	Benin	–	1996	2001	2005
Burkina Faso		1993	1998	2003	–	2010
Cameroon		1991	1998	2004	–	2011
Chad		–	1996	2004	–	2014
Cote d'Ivoire		1994	1998	–	–	2011
Ghana		1993	1998	2003	2008	2014
Guinea		–	1999	–	2005	2012
Mali		–	1995	2001	2006	2012
Niger		1992	1998	–	2006	2012
Nigeria		1990	^b	2003	2008	2013
Senegal		1992	1997	–	2005	2010 ^a

^aMore than one standard DHS survey is available during this period. The earlier survey was used for more conservative estimates.

^bNigeria 1999 DHS excluded due to sampling issues.

Appendix 2: Sexual experience, pregnancy termination, and modern contraceptive use among nulliparous women aged 15–24, by country and survey year

Country	Year	Nulliparous women: Ever had sex (percent)	Nulliparous women: Ever had sex and ever terminated a pregnancy (percent)	Nulliparous women: Ever had sex and ever terminated a pregnancy and currently use modern contraception (percent)
Benin	2001	47.5	9.6	1.90
Benin	2006	42.3	5.9	1.14
Benin	2011	47.4	3.2	0.92
Burkina Faso	2003	36.8	4.6	0.88
Burkina Faso	2010	32.4	3.5	0.72
Cameroon	2004	42.4	9.1	2.09
Cameroon	2011	42.9	9.2	2.11
Chad	2004	22.8	2.4	0.23
Chad	2014	23.9	2.0	0.42
Cote d'Ivoire	2011	47.4	8.8	3.23
Ethiopia	2000	33.3	3.3	0.74
Ethiopia	2005	30.5	1.6	0.33
Ethiopia	2011	35.1	2.5	0.69
Ghana	2008	56.4	9.2	4.35
Ghana	2014	57.7	11.8	5.31
Guinea	2005	40.6	5.3	1.17
Guinea	2012	36.2	4.4	0.92
Kenya	2008	36.5	3.0	0.42
Kenya	2014	40.9	1.5	0.35
Lesotho	2004	44.7	3.8	0.72
Lesotho	2009	47.1	3.4	0.87
Lesotho	2014	48.4	4.6	1.21
Madagascar	2003	32.3	5.1	1.05
Malawi	2000	30.1	3.4	0.61
Malawi	2010	27.3	3.3	0.56
Mali	2001	30.9	5.3	0.91
Mali	2006	29.4	3.6	0.90
Mali	2012	28.5	2.7	0.58
Mozambique	2003	36.0	5.3	1.27
Mozambique	2011	37.1	3.9	1.27
Namibia	2000	51.4	3.8	0.80
Namibia	2006	51.4	3.7	0.51
Namibia	2013	52.1	3.5	0.76
Niger	2006	26.1	3.1	0.50
Niger	2012	24.8	3.1	0.58
Nigeria	2008	44.6	4.2	1.49
Nigeria	2013	42.7	4.1	1.25
Rwanda	2000	30.0	2.3	0.75
Rwanda	2005	32.6	2.4	0.78
Rwanda	2010	35.8	3.0	0.77
Senegal	2010	30.0	3.8	1.02
Tanzania	2004	34.2	5.4	1.21
Tanzania	2010	36.7	5.3	0.95
Uganda	2000	28.2	4.5	0.59
Uganda	2006	30.1	5.1	0.75
Uganda	2011	35.2	5.1	1.04
Zambia	2001	34.0	5.2	1.14
Zambia	2007	32.3	3.4	0.60
Zambia	2013	33.9	3.4	0.71
Zimbabwe	2005	30.6	2.4	1.00

SOURCE: Demographic and Health Surveys.

NOTES: Modern contraceptive methods include oral contraceptive pills, male and female condoms, injectables, implants, and intrauterine devices. Pregnancy termination includes abortion, stillbirth, and miscarriage.

Appendix 3: Modern contraceptive use rates among women aged 15–24 who have ever had sex, by country and survey years

	1990–94 (percent)	1995–99 (percent)	2000–04 (percent)	2005–09 (percent)	2010–14 (percent)
Benin		3.5	8.0	9.5	10.5
Burkina Faso	3.7	9.1	14.7		16.8
Cameroon	2.9	8.0	20.1		23.7
Chad		1.5	1.8		3.6
Cote d'Ivoire	6.8	13.2			16.6
Ethiopia			5.2	12.5	27.6
Ghana	8.5	11.2	17.3	15.8	20.3
Guinea		5.8		9.6	9.1
Kenya	13.3	17.7	16.7	22.8	37.7
Lesotho			27.5	33.4	51.6
Madagascar	1.7	5.9	11.3	19.5	
Malawi	1.7		17.9		30.0
Mali		5.8	6.0	6.5	10.5
Mozambique		3.5	18.1		14.0
Namibia	23.9		44.4	57.2	57.4
Niger	2.1	4.0		3.6	6.2
Nigeria	3.7		10.2	12.3	12.6
Rwanda	7.3		3.7	5.7	27.4
Senegal	3.6	5.1		6.7	8.1
Tanzania	4.4	11.3	17.0		23.7
Uganda		6.1	15.0	16.2	18.4
Zambia	5.0	11.6	16.0	21.4	29.5
Zimbabwe	38.4	41.6		44.2	45.0

SOURCE: Demographic and Health Surveys.

NOTES: Modern contraceptive methods include oral contraceptive pills, male and female condoms, injectables, implants, and intrauterine devices. If more than one survey per 5-year period was available, the earlier survey value was used.

Appendix 4: Women aged 15–24 who have ever had sex who report no modern contraceptive use but do report using condoms at last sexual encounter (Panel A), and women aged 15–24 who have ever had sex who report no modern contraceptive use but do report using condoms at all times in the last 12 months with most recent sexual partner (Panel B)

Panel A Report no modern contraceptive use but report using condoms at last sexual encounter

Survey year	Minimum %	Maximum %	Median %	Mean %	Number of surveys with variable
1990–94	4.20	9.60	6.90	6.90	2
1995–99	0.70	10.40	3.50	3.90	16
2000–04	1.40	16.30	3.60	5.30	17
2005–09	0.40	23.20	3.30	6.40	15
2010–14	0.50	31.20	8.80	9.60	19

Panel B Report no modern contraceptive use but report using condoms at all times in last 12 months with most recent sexual partner

Survey year	Minimum %	Maximum %	Median %	Mean %	Number of surveys with variable
1990–94	–	–	–	–	0
1995–99	–	–	–	–	0
2000–04	–	–	–	–	0
2005–09	0.31	14.80	3.80	4.80	11
2010–14	0.19	21.32	5.80	5.30	22