

## RESEARCH ARTICLE

## Explaining the gender gap in reproductive transition of Ethiopian youths: A decomposition analysis

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## Abstract

The achievement of gender equality and ending all forms of disparity in the spheres of sexual and reproductive health are critical components of sustainable development goals. We endeavor to investigate the characteristics and/or structural sources of the gender gap in the reproductive transition among Ethiopian youths. The analysis was carried out using parts of data drawn from the 2011 and 2016 Ethiopian Demographic and Health Survey. The decomposition of the gender gap in the reproductive transition of youths into components was made using the Blinder-Oaxaca decomposition analysis for non-linear models. The results demonstrate that the delay in the age at first marriage among the youth was accompanied by an increase in the prevalence of premarital sex. Furthermore, the findings show that the gender gap in reproductive transition is triggered by both compositional and structural effects of covariates such as education, modern contraceptive use, and media exposure. Thus, in addition to reducing inequalities in education, media exposure, and deprivation between male and female youths, working on the structural components is recommended to close the gender gap in the reproductive transition of youths.

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## 1. Introduction

In many areas, including education, health, and economic empowerment, there is a significant gender disparity, particularly in developing nations (Jayachandran, 2015). Goal 5 of the Sustainable Development Goals (SDG) promises an end to all forms of gender disparity everywhere and to achieve gender equality by 2030. However, the United Nations admits that the world is falling behind in terms of progress toward gender equality (UNDESA, 2023). The inequality is caused by a complex set of factors, including economic and cultural norms, as well as the interaction of these factors (Jayachandran, 2015).

Ethiopia is one of Africa's demographic powerhouses (Hailemariam, 2017). Women and girls constitute half of Ethiopia's population (Ethiopian Statistics Service, 2020), and they are more vulnerable than men. In Ethiopia, a woman's worth is determined by her role as a wife and a mother, and compared to men, women face a wide range of barriers and have limited access to economic, social, and political empowerment (Dessalegn

*et al.*, 2020; Dula, 2019). One of the most significant barriers is lack of access to education. Only 44.4% of Ethiopian women over the age of 15 are literate, compared to 59.2% of men in 2017 (UNESCO, 2023). This not only limits their ability to participate in the workforce but also perpetuates a cycle of poverty and discrimination. Further, women also lack of access to healthcare due to factors such as poverty and limited knowledge about the importance of healthcare including childbirth and contraceptive use. This leads to unplanned pregnancies and increased risk of maternal and child mortality (Jebena *et al.*, 2022; Kitila *et al.*, 2023; Tamirat *et al.*, 2020).

In an attempt to alleviate the highly persistent gender inequality, Ethiopia made a shift in policy thinking and passed several legislations. One of the various initiatives Ethiopia has undertaken is the family law, which advocates equal rights in the administration of the family and sets the minimum age for marriage at 18 (Federal Democratic Republic of Ethiopia, 2000). Early sexual initiation, child marriage, and adolescent birth rates all significantly decreased when the law went into effect. The occurrence of the drop in both rural and urban places lends credence to the notion that strong legal frameworks for gender equality may operate as potent accelerators for cultural change (Rokicki, 2021).

Despite the improvements scored in areas of adolescent and youth reproductive health, gender inequality remained to be a significant challenge in Ethiopia. Early marriage is still prevalent, and adolescent girls often married off before they are physically and emotionally mature (CSA [Ethiopia] & ICF International, 2016). Child marriage robs young girls of an education and puts them at risk of exploitation and pregnancy-related complications (Abera *et al.*, 2020). Thus, early marriage and parenthood serve to reinforce traditional gender roles and expectations, which perpetuates gender disparity. As a result of which, young girls' agency and autonomy may be restricted, and patriarchal beliefs and behaviors may be maintained.

The reproductive behavior of youths is changing over time, and youths' transition to family formation and parenthood generally shifted from the traditional pattern and followed a variety of patterns in Ethiopia. In a recent study, sex was noted as a significant element that led to the disparities in the reproductive trajectories of the youth in Ethiopia (Dejene & Gurmu, 2022). Even though there was a large body of literature that studied the issue of early marriage and parenthood among young females (Blum, 2007; Koski *et al.*, 2017; Nguyen & Wodon, 2015; Wado *et al.*, 2019), the driving forces of the gender gap were not well studied. To shrink and/or eliminate the gender gap in the timing of the reproductive transition of

youths, a thorough understanding of the underlying causes is essential. As such, we base our work on the premise that gender inequality in the timing of the reproductive transition is spanned by structural effects of covariates as well as differences in characteristics between male and female youths.

## 1.1. Theoretical grounding of the research

The life-course theory, which places developments in people's lives in both personal characteristics and larger social contexts, served as the study's overarching theoretical framework. The theory posits that prior and current life stages influence the trajectory of life experiences of individuals and families. Thus, in view of the life-course theory, the interplay between socioeconomic, environmental, and behavioral factors are considered the underlying drivers of trajectories over lifespan (Chen & Lin, 2011; Piccarreta & Studer, 2019). Such consideration of the interdependence between different stages of life enables the comparative study of the life-course experiences.

Reproductive transition disparity in developing nations can be related to a number of variables, including lack of access to education and healthcare and poverty. The previous reports indicated that educational attainment, household wealth, exposure to media, and economic reasons were the major factors that influenced the timing of reproductive transitions of African young females (Usman *et al.*, 2018; Wado *et al.*, 2019). Socio-economic deprivation exacerbates reproductive transition inequality by restricting access to essential resources and increasing the likelihood of early marriage and childbearing among adolescents. Similarly, due to a lack of education, there may be a lack of awareness about family planning and reproductive health, resulting in an unmet need for contraception and unplanned childbirth (Munakampe *et al.*, 2021).

With a better access to a healthcare, contraceptive use becomes more widespread, leading to delayed childbearing and a longer interval between children. As a result, women would have a better chance of maintaining their health and avoiding complications that can arise from too many pregnancies close together. Moreover, by delaying the first birth, young women have a higher chance to complete their education and gain employment, leading to greater opportunities in life (Diez *et al.*, 2020; Stevenson *et al.*, 2021). Overall, contraception can aid in removing obstacles to education and raising chances for success by lowering unintended pregnancies and giving women the power to make decisions about their life.

In addition, after controlling for individual characteristics, a study from West Africa reported that

community-level factors such as community literacy and level of socioeconomic deprivation were found to be predictors of union formation and childbearing. In more affluent communities and communities with higher levels of education, young people tend to delay sexual activity and use contraception more consistently. In contrast, in communities with lower socioeconomic status and limited education, young people are more likely to engage in risky sexual behavior, have higher rates of unintended pregnancies, and are less likely to use contraception. Ultimately, community affluence and education can greatly impact the reproductive behaviors of youth and their overall health outcomes (Avogo & Somefun, 2019).

Holding the perspective that both endowment and structural effects are needed to evaluate mechanisms of closing the gender gap in the timing of the reproductive transition, both individual and community-level factors are used. Therefore, our study aims at comparing the reproductive transition experiences of male and female youths in their life course before age 25. The structural elements and underlying characteristics differentials that contributed to the gender disparity have also been evaluated using a decomposition analysis framework.

## 2. Data and methods

### 2.1. Data source

The data for this study were drawn from the two most recent Ethiopian Demographic and Health Surveys (EDHS), which were conducted in 2011 and 2016. The EDHS was a large-scale cross-sectional survey conducted to offer estimates of key demographic and health variables for the nation as a whole, urban, and rural areas separately, and each of the nine regions of Ethiopia and two city administrations separately. The data were gathered using a stratified two-stage cluster sampling technique. The probability proportional to size technique was used to select 624 clusters in the 2011 and 645 clusters in the 2016 survey. During stage two selection, a full listing of households in the selected clusters was conducted, and 28 households were chosen from the list of households (CSA [Ethiopia] & ICF International, 2012, 2016). The investigation was limited to the Oromia Regional National State because the region is home to a substantial portion of Ethiopia's youth population (38.3%), who come from a variety of cultural backgrounds (Ethiopia Statistics Service, 2021; Yates, 2011; 2020). Although both male and female data were utilized, the gender gap decomposition analysis is focused only on the data drawn from the 2016 EDHS. The data utilized for our study are publicly available at the following web address (<http://www.measuredhs.com/data/available-datasets.cfm>) and can be accessed free-of-charge.

### 2.2. Variables and measurements

The main outcome variables of the study are the gender gap in distributions of the reproductive transitions of youths. The gender gap in these reproductive indicators is assessed using the cumulative incidence functions (CIFs) of these reproductive events over the age of youths. Rather than an instantaneous measure of the risk of reproductive transition, CIF gives the proportion of youths that have ever experienced an event at any given time (Hinchliffe & Lambert, 2013; Latouche *et al.*, 2013). This property of CIF makes it desirable for the gender gap analysis over the instantaneous measure. The detailed gender gap decomposition was made for debut to sex and parenthood experiences at ages 20 and 25. For the transition to first sex, the timing of first sex either prior or within marriage was considered.

Individual and group-level variables (i.e., household and community level) are considered predictors in the gender gap decomposition analysis. The description of these variables is available in the standard recode manual of the Demographic and Health Survey (DHS) (ICF, 2018). The list of variables, their coding, and descriptions is shown in [Table 1](#).

### 2.3. Data processing and analysis

The data management, editing, and analysis were conducted using STATA 17.0 (StataCorp, 2021). First, a sex- and birth cohort-specific cumulative incidence of events was computed using the command *stcompet* (Coviello & Boggess, 2004). The command creates CIF in the presence of competing risks. For the transition to parenthood, however, the CIF was computed using the complement of the Kaplan–Meier estimate. The inter-cohort differences of the cumulative incidence of events were tested using competing risk regression analysis (He *et al.*, 2016). These comparisons were made for CIFs accounting for intra-class correlation for clusters of enumeration areas. First-order interactions between birth cohort and sex were tested and significant results were retained.

Second, the gender gap in debut to sex and parenthood experiences at age 20 and 25 was tested for the recent birth cohort (1985 – 1989). Where significant, the gap was decomposed using Blinder Oaxaca decomposition for logistic regression model. This analysis was carried out using the user-written *oaxaca* command. During the analysis, the command was issued to take into account the survey design (Jann, 2008; Kaiser, 2015; Rahimi & Hashemi Nazari, 2021; Sinning *et al.*, 2008). *P*-value of 5% was used to declare statistical significance in all analyses including the decomposition analysis.

The Blinder-Oaxaca decomposition technique splits the overall gender gap into two parts. The first component

**Table 1. Description of variables and their measurement used in the analysis**

Type	Name and label	Description and measurement	Source
Control (categorical)	Birth cohort	Two groups of birth cohorts, that is, those born in the years 1980 – 1984 and 1985 – 1989 were used to compare the reproductive transitions of youths. It was computed from the birth date data of respondents (v011/mv011)	Computed
Grouping or comparison (categorical)	Sex of respondents (sex)	This variable was created during the merging of data of male and female youths (0=Male, 1=Female). It is used as a grouping variable during the decomposition analysis	Computed
Independent (categorical)	Early initiation of sex (debut to sex before the age of 20) (v531/mv531)	This is a binary variable that indicates whether the respondent is sexually active or transitioned to marriage before age 20 (0=No, 1=Yes)	Computed
Independent (categorical)	Educational level (v106/mv106)	Highest education level attended. This is a variable that shows the level of education in the following categories: 0=Not educated, 1=Educated	Individual interview data
Independent (categorical)	Exposure to media (Radio/TV) (v158, v159/mv158, mv159)	Exposure to media (radio/TV) of respondents. It was computed from interview data and recoded as 0=None, 1=Infrequent, 2=Frequent	Computed from individual interview
Independent (categorical)	Contraceptive use (v313/mv313)	Current use of any type of modern contraceptive use. It was computed from interview data and recoded as 0=No, not using a modern method, 1=Yes, using a modern method	Computed from individual interview data
Independent (categorical)	Household wealth (v190/mv190)	Households falling in the richer or richest wealth quintile. It was computed from interview data and recoded as 0=No, 1=Yes	Computed from household data
Independent (numeric)	Community-level Youth Industry Employment	Percentage of industry-employed youths of all youths in a community (enumeration area)	Computed from household data
Independent (numeric)	Community affluence	Percentage of the population living in a well-off household in a community (enumeration area)	Computed from household data
Independent (numeric)	Community literacy	Percentage of population (age-appropriate) with at least a secondary level of education in a community (enumeration area)	Computed from household data

is referred to as the endowment effect; it extracts part of the gender gap that is attributable to differences in characteristics of the two groups. The second part referred to as the coefficient or structural effect shows the discriminatory effect of the covariates and the effects of unknown factors (Jann, 2008; Kaiser, 2015). In our analysis, the coefficients for the pooled model were considered the non-discriminatory coefficients or reference coefficients. It should be noted that the decomposition of the gender gap in reproductive transition was made from the viewpoint of male youths. That is, the female-to-male gender gap was decomposed into components.

The study made use of data from the Demographic and Health Surveys Program. The ICF/ORC Institutional Review Board reviewed and approved the methods and questionnaires for standard Demographic and Health Surveys. Ethiopian DHS was also ethically approved by the Institutional Review Board offices of Ethiopia's Ministry of Science and Technology and the Ethiopian Health and Nutrition Research Institute. The interviews were conducted with the express permission of the respondents. To protect respondents' privacy, names and other unique

identifiers were removed from the final data that was made public.

### 3. Results

The sample constituted 1775 respondents from the 1980–1984 and 1753 respondents from the 1985–1989 birth cohorts. The recent birth cohort of youths consisted of 1003 females and 750 males, whereas the 1980–1984 birth cohort had 776 male and 999 female respondents. The 1985–1989 birth cohort of male youths were better educated, had better exposure to media, and live in well-off households than their female contemporaries. Contrarily, female youths of the recent cohort started their reproductive transition earlier and were slightly disadvantaged in terms of modern contraceptive utilization (Table 2).

The cumulative incidence of the debut to premarital sex (PMS) among the recent birth cohort of male youths has substantially increased over age, with the inter-cohort gap growing progressively starting at age 15 (Figure 1A). In contrast, for female youths, the inter-cohort gap in cumulative incidence of the debut to PMS remained consistent over age. Furthermore, the cumulative

incidence of transition to PMS among female youths in the most recent birth cohort was found to be higher than the corresponding male youths (Figure 1D). Concerning the transition to marriage, a significant reduction in the cumulative incidence rate in both male and female youths was observed. For male youths, the inter-cohort gap became noticeable after age 19; while for female youths, the gap started to steadily expand starting at age 15 (Figure 1B and E).

The transition to parenthood after the onset of PMS or marriage, however, revealed a marginally positive but statistically insignificant gap between birth cohorts of both

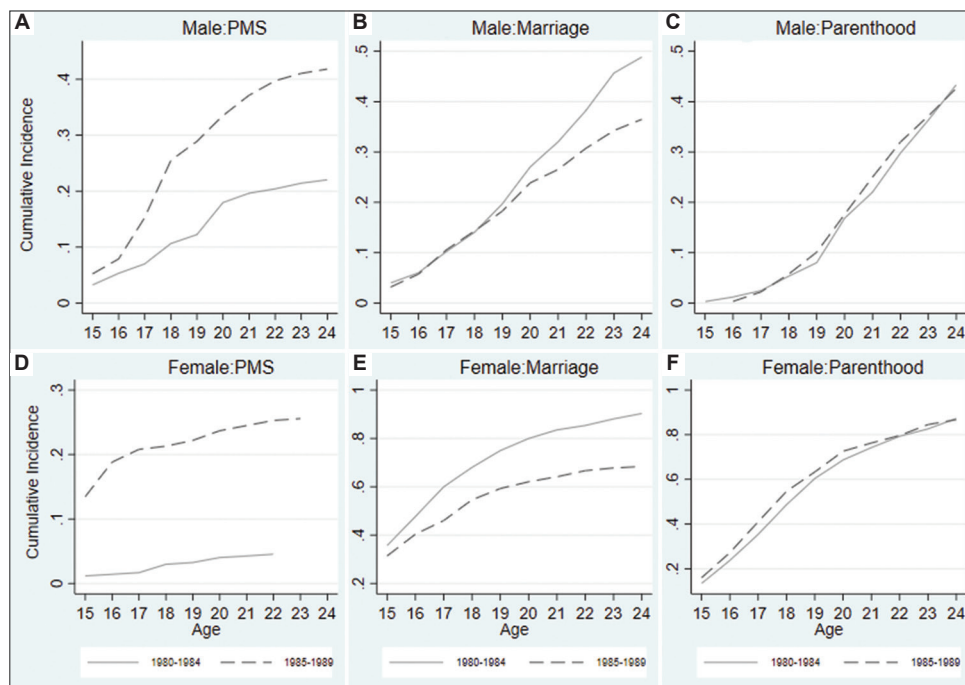
male and female youths. By the age of 15, one in every five female youths had begun childbearing, whereas the transition to parenthood for male youths was completely absent. In addition, the results showed that a large volume of the transition to parenthood of female youths happened before age 20; however, for male youths, a large proportion of it occurs after age 20 (Figure 1C and F).

The competing risk regression analysis result showed that the inter-cohort differences in the CIF of premarital sex and marriage were significant and the difference is not the same for male and female youths. For premarital sex, the inter-cohort difference has shown a statistically significant increase, and an extremely higher rate of increase was observed among female youths than males. Contrarily, the transition to marriage has shown a significant risk reduction with female youths having a higher risk reduction than males. For transition to parenthood, although females were at a higher risk of transition to parenthood than males, the birth cohorts had a similar risk of transition to parenthood for both sexes (Table 3).

Distribution of debut to sex, either PMS or marriage, at ages 20 and 25 was compared and decomposed into components for male and female youths. The gender gap in the prevalence of debut to sex at age 20 amounted to 28.4% and the corresponding figure at age 25 was

**Table 2: Percent distribution of characteristics of youths of the 1985–1989 birth cohort by sex**

Characteristics	1985 – 1989 birth cohort	
	Male (n = 750)	Female (n = 1003)
Attended primary and above level of education	72.7	32.5
Have exposure to media	66.8	39.2
Living in a well-off household	43.5	39.6
Use modern contraceptive method	31.7	28.3
Became sexually active before age 20	45.7	79.3



**Figure 1.** Cumulative incidence of premarital sex, marriage, and parenthood among youths  
 Note: (A) displays the cumulative incidence for male youths for the two birth cohorts. (B) shows the cumulative incidence for transition to first marriage for male youths for the two birth cohorts. (C) portrays the cumulative incidence of transition to first fatherhood for the two birth cohorts. (D) captures the cumulative incidence for female youths for the two birth cohorts. (E) displays the cumulative incidence for transition to first marriage for female youths for the two birth cohorts. (F) shows the cumulative incidence of transition to first motherhood for the two birth.

15.7%. While 28% of the gender gap in debut to sex at age 20 (0.079) was explained as a result of differences in characteristics, it was a quarter (25.5%) of the gender gap at age 25 (0.040) that was explained by the difference in the distribution of characteristics. Further, inequality in the level of educational achievement was the sole factor

that significantly contributed to the gender gap in the distribution of debut to sex, approximately 30%, at both ages 20 and 25 (Table 4).

**Table 3. Cox and competing risk regression analysis**

Variables and characteristics	PMS	Marriage	Parenthood
	SHR	SHR	HR
Birth cohort			
1980–1984 [Ref]	1.00	1.00	1.00
1985–1989	2.10***	0.72***	1.04
Sex			
Male [Ref]	1.00	1.00	1.00
Female	0.19***	3.66***	3.62***
Birth cohort # Sex (Interaction)			
1985 – 1989 # Female	3.17***	0.81**	

Note: PMS: Premarital sex; SHR: Sub-hazard ratio; HR: Hazard ratio. Statistical significance is indicated with \*\* $p < 0.05$ ; \*\*\* $p < 0.01$ .

Differential effects of predictors were also responsible for the gender gap in the distribution of debut to sex at age 20. The negative contributions of above-primary level educational attainment (−0.100) and community affluence (−0.178) indicate that these factors significantly reduced the prevalence of debut to sex at age 20 for female youths more than otherwise expected. On the other hand, the discriminatory effect of household wealth (0.063) contributed to about 22% of the gender gap in the debut to sex. No significant contribution of individual predictors was reported for the coefficient effect at age 25 (Table 4).

The transition to parenthood was also the focus of the gender gap decomposition analysis. The decomposition analysis was made at two points, that is, at ages 20 and 25. At the age of 20, there was a 55% of difference in the percentage of female and male youths that transitioned to parenthood. The gender gap in transition to parenthood at age 25, however, shrunk to 34% from 55% at age 20.

**Table 4. Decomposition analysis of gender gap in reproductive transition**

Overall and components of decomposition	Debut to Sex		Parenthood	
	Age 20	Age 25	Age 20	Age 25
Overall gap (%)	0.284***	0.157***	0.550***	0.341***
Endowments (%)	0.079**	0.040**	0.205***	0.191***
Attended primary and above level of education	0.086***	0.049***	0.050***	0.078***
Have exposure to media	−0.007	−0.012	−0.016	0.006
Living in a well-off household	−0.002	0.001	0.002	−0.001
Use modern contraceptive method			−0.001	−0.008
Became sexually active before age 20			0.169***	0.113***
Community affluence	0.001	0.001	0.002	0.003
Community literacy	0.000	0.001	0.000	0.000
Level of youth employment in industry	0.000	0.000	0.000	0.000
Coefficients (%)	0.205***	0.117***	0.345***	0.150***
Attended primary and above level of education	−0.100***	−0.027	−0.091	−0.002
Have exposure to media	0.015	0.014	0.034**	0.024
Living in a well-off household	0.063**	0.010	0.094	0.017
Use modern contraceptive method			0.041	0.035**
Became sexually active before age 20			0.095	0.103***
Community affluence	−0.178***	−0.063	−0.118	−0.003
Community literacy	0.058	−0.001	0.145**	0.021
Level of youth employment in industry	−0.022	0.013	−0.083	−0.010
Constant	0.368***	0.170***	0.227	−0.035

Note: The number indicate proportion of contribution to the gender gap in reproductive transition. Endowments indicate contribution of differences in characteristics between male and female to the gender gap. Coefficients, on the other hand, show the contribution of structural differences to the gender gap. Statistical significance is indicated with \*\* $p < 0.05$ ; \*\*\* $p < 0.01$ .

The gender gap decomposition analysis revealed that approximately 37% of the difference at age 20 and 56% at age 25 was due to differences in characteristics of male and female youths. The differential influence of confounders, including the overall effect of unknown factors, contributed to the remaining gender gap. The detailed decomposition provided the contribution of each of the predictors to both the endowment and coefficient effects (Table 4).

The difference in the proportion of sexually active before the age of 20 contributed the most (0.169) to the gender gap in the transition to parenthood at age 20. Interpreted another way, a reduction in the difference in the prevalence of early sexual debut will lead to a reduction of approximately 31% of the total gender gap in parenthood at age 20. Furthermore, the difference in attainment of at least a primary level of education (0.050) between the sexes contributed to 9% of the gender gap in the transition to parenthood at age 20. The differential effects of community literacy (0.145) and exposure to media (0.034) significantly contributed to the gender gap in early parenthood. A significant portion of the gender gap in parenthood at age 25 was explained by differences in the proportion of early debut to sex (0.113) and level of education (0.078) between female and male youths. On the other hand, it was the differential influence of early debut to sex and contraceptive use that significantly predicted the gap in transition to parenthood (Table 4).

## 4. Discussion

The study used a decomposition analysis framework to assess the gender gap in the reproductive transition of youths and its components. Individual and community-level factors were used in our analysis. The results demonstrated that a large proportion of the gender gap happens during adolescence and results from structural effects of factors than differences in characteristics between male and female youths. The findings imply the mere fact that the elimination of disparities in individual-level socioeconomic and community-level factors is not sufficient to close the gender gap.

### 4.1. Expanding school attendance promotes the delayed reproductive transition of female youths

Rates of the debut to premarital sex and entry into marriage have grown in contrast to one another over birth cohorts. The gender gap in the magnitude of early debuts to sex, either premarital or within a marital context, was solely determined by the difference in the level of education of male and female youths. Studies have shown that delaying early marriage can be accomplished by encouraging female youths to continue their education past the primary level and supporting them in building and expanding

their social networks (Bezie & Addisu, 2019; Erulkar & Muthengi, 2009; Liang & Yu, 2022; Raj *et al.*, 2019). In line with this, in a study from Tanzania, a relatively higher cost of schooling and an increasing prevalence of premarital sex were cited as leading factors for entering into marital life at an early age (Stark, 2018). Hence, working toward removing the barriers to adolescent girls' education to pursue beyond the primary level can act as a leaven to improve youth reproductive transitions.

### 4.2. The gender gap in the reproductive transition of youths is the highest during adolescence

Although the transition to parenthood was consistent across birth cohorts for both sexes, a substantial gender gap was observed in the transition profile having a maximal gap during adolescence. The primary driving factor for the gender gap in the transition to parenthood was the difference in the early timing and magnitude of youths' debut to sex and entry into marriage. Female youths faced significant disadvantages compared to their male peers because they typically initiate sex early and utilize contraception inadequately during their sexual encounters. Studies that concur with our findings have indicated that young women's transition to parenthood was positively impacted by contraceptive counseling and addressing their demand for contraception (Brittain *et al.*, 2015; Diez *et al.*, 2020; Sánchez-Páez & Ortega, 2018).

### 4.3. The gender gap in the reproductive transition of youths was largely determined by structural differences than socio-economic inequalities

The findings support the premise that the gender gap in the reproductive transition of youths was not only a product of socioeconomic inequalities but also a result of discriminatory effects of socioeconomic factors. The educational level of adolescent girls had a stronger influence on delaying their debut to sex than it had for adolescent boys. This finding affirms previous findings that reported a stronger return to education in delaying debut to sex and entry into marriage among adolescent girls (Ahonsi *et al.*, 2019; Misunas *et al.*, 2021; Petroni *et al.*, 2017). On the other hand, the fact that household wealth and community affluence played a contrasting discriminating role in youths' debut to sex is an interesting finding of this study. While female youths living in well-off households had an increased risk of the debut to sex than males, in contrast, community affluence by far protects female adolescent youths.

The findings indicated that as opposed to its impact on male adolescents, community literacy increased the risk of adolescent motherhood for adolescent girls. This suggests that the pro-natalist norm of highly educated

societies is more likely to be passed on to adolescent girls once they become sexually active than adolescent boys. Similar findings were reported from a study done among Zimbabwean adolescent women on modern contraceptive use stating that the odds of contraceptive use among adolescent women reduced with an increase in community literacy level of women (Ngome & Odimegwu, 2014). Further, it had been reported that exposure to mass media increases the use of contraception as a result of exposure to family planning messages and results in delayed parenthood (Ngome & Odimegwu, 2014; Petroni *et al.*, 2017). The result reveals that well-informed female and male youths did not have an equal transition rate to parenthood. This differential effect of media exposure calls for targeting female adolescents in reaching information regarding family planning and encouraging the use of it once they are sexually active.

#### 4.4. Strengths and limitations

Studies that inform our understanding of reproductive behavior focused on individual and community-level factors without reference to the structural effects of these factors. Hence, this study attempts to extend previous works by decomposing the gender gap in the reproductive transitions among youths into inequalities in and structural effects of variables. The study focused only on individual and community-level socioeconomic and reproductive-related factors to decompose the gender gap in the reproductive transition of youths. EDHS data were collected using an event history approach and the accuracy of information depends on the respondent's ability to recall the sequence of events that may be affected by memory lapse (Neal & Hosegood, 2015). As a result, caution is advised when interpreting the results. Moreover, event history data are collected for those who were available at the time of the survey. As a result, the analysis did not take into account or adequately represent the reproductive experiences of deceased and migrant youths.

#### 5. Conclusions

The results demonstrate that the gender gap in reproductive transition was wider for adolescents. Family and institutional support to keep adolescent girls in school is required to curb the early transition of female adolescents to sex or marriage and motherhood. In addition, supporting youth-friendly family planning services in terms of advertising family planning methods and addressing the contraceptive demand of sexually active adolescent girls are issues to be given the utmost priority. Community interventions that target deprived communities and those with pro-natal norms can help reduce the structural components of the gender gap in the reproductive transition. Further research

is also recommended to unveil unknown factors that could contribute to the gender disparity in the transition to premarital sex or marriage.

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#### Conflict of interest

The authors declare that they have no competing interests.

#### Author contributions

*Conceptualization:* Tariku Dejene, Eshetu Gurmu

*Data curation:* Tariku Dejene

*Formal analysis:* Tariku Dejene

*Methodology:* Tariku Dejene, Eshetu Gurmu

*Writing – original draft:* Tariku Dejene

*Writing – review & editing:* Tariku Dejene, Eshetu Gurmu

#### Ethics approval and consent to participate

Secondary data from the 2011 and 2016 EDHS were used in this study. The methodologies and questionnaires for Demographic and Health Surveys were reviewed and approved by the ICF/ORC Institutional Review Board. In addition, the study protocols obtained ethical approval from the Ethiopian Ministry of Science and Technology's Institutional Review Board offices and the Ethiopian Health and Nutrition Research Institute. Interviews were conducted after gaining verbal consent from respondents.

#### Consent for publication

The final data did not contain respondents' names or other distinctive identifiers to protect their privacy. Thus, no consent was required as the analysis was based on publicly available dataset.

#### Availability of data

DHS data are publicly available for use free-of-charge and can be obtained on request at the following web address: <https://dhsprogram.com/data/available-datasets.cfm>

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