

# **Levels, Trends and Differentials of Adolescent Motherhood in Ethiopia: Evidences from 2005 EDHS**

**Eshetu Gurm, Center for Population Studies, Addis Ababa University  
Tariku Dejene, Department of Epidemiology, Jimma University**

## **ABSTRACT**

*Adolescent childbearing has undesirable consequences. Dropping out of school, high rates of abortion, maternal mortality and morbidity are noted consequences of adolescent pregnancy and childbearing. The objective of this study is to analyze the levels, trends and differentials of adolescent motherhood in Ethiopia. It is based on the 2005 Ethiopian Demographic and Health Survey data. A multilevel logistic regression is fitted to analyze the determinants of adolescent childbearing. Adolescent motherhood in Ethiopia has shown a generally declining trend over time. The decline was more marked in the periods following the adoption of the national population policy in Ethiopia. It was lower in urban areas and among women who have secondary and above education. It was, however, higher among women who were not working and those engaged in agricultural activities. Housewives and women working in agricultural sector should be given attention to reduce the risks and consequences of adolescent motherhood.*

**Key words:** Adolescent motherhood, teenage fertility, early marriage, Ethiopia.

## INTRODUCTION

Adolescence is a prime period in an individual's life (Steinberg, 2002). A number of pertinent social, economic, biological, and demographic changes take place during adolescence. The future of adult life is highly dependent upon gains and losses during adolescent age. If they take advantages and opportunities for personal growth, and avoid potentially problematic outcomes related with sexual relations such as unplanned pregnancies and its adverse health effects resulting in early dropout from school (Bongaarts and Cohen, 1998), they would be more successful in their life. However, a number of adolescents are physically more mature than mentally. They are often ill prepared to make unwise decisions to face serious difficulties affecting their future life (Hughes & McCauley, 1998). The problem is rampant for adolescent girls who would engage in sexual relations resulting in teen motherhood, abortion or complications of pregnancy.

Studies undertaken in the developed world stated that the age at menarche has decreased at a rate of approximately four months each decade over a period of a hundred years and similar trend is also observed in sub-Saharan Africa (Zabin and Kiragu 1998). The decline in age at menarche has an effect on early debut in sexual activity and early childbearing (Crockett *et al.*, 1996). Early sexual activity with poor record of contraceptive use exposes many young women to unplanned and unwanted pregnancies (Coley and Chase-Lansdale, 1998).

Of the 73.8 million population of Ethiopia in the 2007 Population and Housing Census (CSA, 2010) about 45.0% of the population is below age 15 and 56.9% are below age 20. Results of the 2005 Ethiopian Demographic and Health Survey report shows that 46% of the Ethiopian women aged 20-24 years give birth to child before reaching age 20 while the median age at first birth is 19.2 years for women aged 25-29 (CSA and ORC Macro, 2006). What is surprising from Ethiopian recent population and housing census as well as demographic and health survey is the fact that the Ethiopian population is not only young but also the young itself starts reproducing early.

As clearly stated in the works of Wulf and Singh (1991) as well as Gupta and Mahy (2003), early entry into childbearing elongates the duration of reproductive period and results in larger

family size. The long-term demographic effects of adolescent fertility in non-contraceptive societies are not only limited to high fertility but also there is increased rate of maternal morbidity and mortality since most of the adolescents attempt to abort and miscarriages (WHO, 2001; Coley and Chase-Lansdale, 1998). According to UNICEF (1998) and Mayor (2004), adolescent pregnancy is a leading cause of death for young women aged 15 to 19 globally with complications of childbirth and unsafe abortion being the major factors. The psychological trauma of unwed adolescent mothers has also severe emotional depression and social stress (Eshetu and Tadese, 1998) besides social segregation and isolation in traditional societies like Ethiopia (Seyoum and Desta, 1998).

Far beyond this, adolescent childbearing has tremendous effects on the educational attainments of young women (Klepinger *et al.*, 1995; Lloyd and Barbara, 2006) that would ultimately affect their contribution and position in the society. Their success and achievements will be halted as these young mothers are forced to drop out of school and look after their babies instead of gaining skill and knowledge that boost up their social and economic positions later on (McDevitt *et al.*, 1996). Dropping out of school has undesirable consequences for teenage mothers. Frustration and hopelessness often lead them joining commercial sex work, drug addictions and other undesirable social behavior (Hotz, McElroy, & Sanders, 1997; Miller *et al.*, 2003).

According to Legrand and Barbieri (2002), high infant and maternal mortality and morbidity are the most noted consequences of adolescent childbearing in sub-Saharan Africa. Births to adolescent mothers are also very likely to be of low birth weights that were prone to deaths at infancy (Alison *et al.*, 1995). Studies undertaken in Ethiopia have also revealed that maternal mortality is the highest among adolescents (Kwast, Rochat and Kidane-Mariam 1986; Gaym, 2009). Zabin and Kiragu (1998), for instance, documented that adolescents who had not yet celebrated their 16 anniversaries had six times more risk of death than those young mothers aged 20-24. A retrospective study undertaken by Gaym (2000) in Jimma Hospital, Southwestern Ethiopia, had also shown that 22% of the maternal deaths were among adolescent mothers. Taking the seriousness of the consequences of adolescent's pregnancy and motherhood, this study attempts to analyze the levels, trends and differentials of adolescent childbearing or

motherhood in Ethiopia. Specifically, the study attempts to: (i) look at the levels and trends of adolescent motherhood and (b) identify socioeconomic and demographic factors determining adolescent motherhood.

## **Theoretical perspectives**

Although a range of theories are available to guide researches on risk factors associated with adolescent pregnancy and childbearing, interactive or socialization theory that posits socialization as an important influence on sexual behavior and childbearing of adolescents (Crockett *et al.*, 1996) and the rational choice theory that emphasizes on socioeconomic factors affecting adolescent sexual behavior (Florez and Nunez, 2001) appear to dominate contemporary studies.

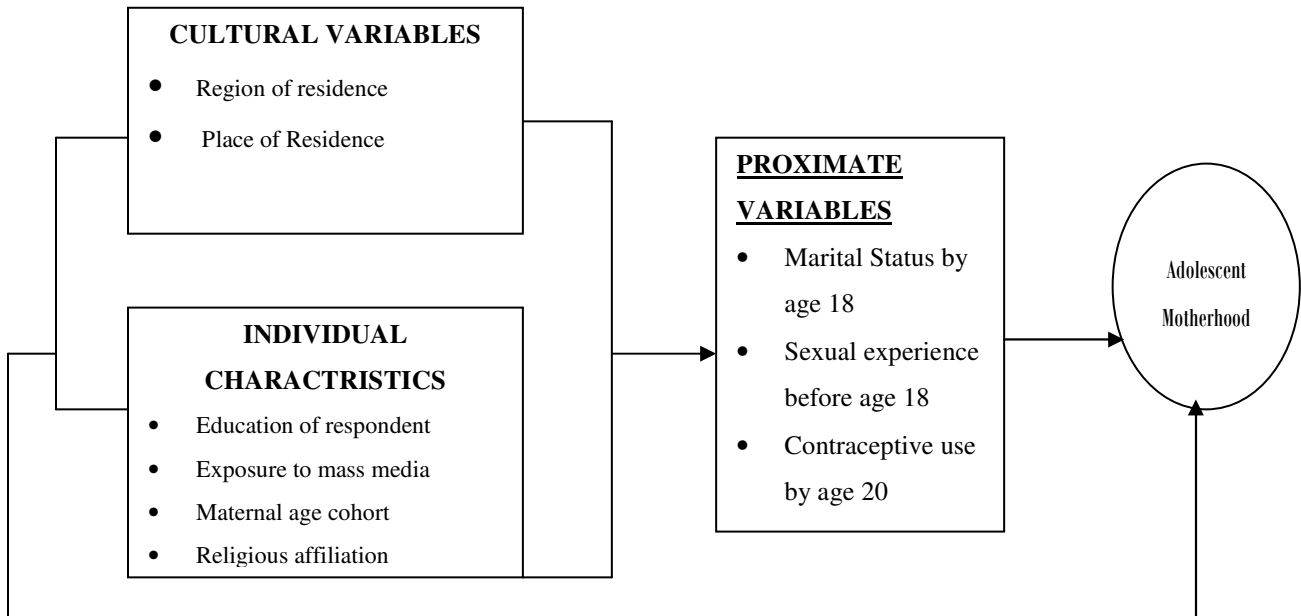
Interactive theory states that adolescent reproductive behavior is a function of sexual behavior among older siblings and other family members that leads to early intercourse and childbearing in a family (Crockett *et al.*, 1996). East (1996), who compared the perception of younger brothers and sisters of pregnant or teenage mothers and never-pregnant teenagers towards teenage pregnancy and childbearing, showed that younger sisters of both pregnant and teenage mothers are more accepting of teenage childbearing and have more definite intention of having a child at youth age. Other studies (Manlove *et al.*, 2000; Gigante *et al.*, 2004) also reported that being a daughter of a teenage mother is associated with an earlier intercourse and teenage pregnancy among girls. The general consensus of these studies showed that experiences within the family members have significant effect on the timing of sexual intercourse and child bearing.

The rational choice model, that considered individuals as rational entities taking choices or actions aimed at optimizing their fixed preferences based on their beliefs in the chosen actions (Friedkin, 1990 cited in Abell, 2003), on the other hand, suggested that teenage childbearing is a response to the underlying socio-economic opportunities and constraints of teenagers (Florez and Nunez, 2001). Studies conducted in four Latin American countries: Chile, Barbados, Guatemala and Mexico (Buvinic, 1998) and five developed countries (Sing *et al.*, 2001) have, for instance, shown that early childbearing is more likely among socially-

disadvantaged adolescents than their better off peers. Taffa and Obare (2004), who analyzed the 2000 Ethiopian Demographic and Health Survey data, also arrived at the same consensus. According to them, a significantly larger proportion of adolescent mothers in Ethiopia were from rural areas, belonging to poor households, less educated, and have no history of marriage. Economic and social deprivation appears to expose Ethiopian adolescents to early and unsafe sexual relations resulting in teen motherhood.

As indicated above, adolescents’ decision to have children is partly dependent upon their family status, the environment in which they were raised, the economic and school opportunities they have, and personal characteristics to be developed in due course. Consequently, this paper uses the rational choice model to analyze the levels, trends and differentials of adolescent motherhood. Distinction of two groups of variables by Bongaarts (1978); that is, the proximate determinants of fertility and background characteristics of respondents in analyzing factors influencing fertility has also been adopted to serve as the analytical framework of this study.

Figure 1: Analytical framework for the analysis of adolescent motherhood: Adopted from a framework for analyzing the proximate determinants of fertility (Bongaarts, 1978).



As clearly shown by Bongaarts (1978), the background variables are expected to have both direct and indirect effects on adolescent motherhood while the proximate determinates play significant roles. It is, however, unfortunate that most of the proximate determinants of fertility indicated in the Bongaarts's model such as lactational infecundability does not apply to women who do not have a previous child and sterility, spontaneous and induced abortions are not considered since there were inconsistency and incompleteness for most of the cases in the data (See Figure 1).

Much emphasis are, however, made to see (a) whether adolescent motherhood is higher in rural than urban areas, (b) there is an inverse relationship between adolescent motherhood and educational attainment of women, and (c) adolescent motherhood has shown a declining trend among younger cohort women.

## **DATA AND METHODS**

This study is carried out using quantitative data obtained from the 2005 Ethiopian Demographic and Health Survey. The statistical analysis includes adult women in their reproductive age (i.e. 20-49 years) as fertility of women in the 15-19 age group provides an incomplete information on adolescent maternal situation; and since this cohort has not yet lived through the complete years of teens for which the risk of motherhood is analyzed. The units of analysis to be considered in this study is, therefore, adult women who have celebrated their 20<sup>th</sup> anniversary, and a total of 10,818 women are included in the analysis from the 2005 EDHS.

### **The MODEL**

Multilevel modeling procedure is employed in this study to examine the extent to which cluster variations in the risk of teenage motherhood exists (Goldstein, 2003). Both theoretical and empirical considerations of the distribution of a binary response variable suggest that the shape of the response function will be sigmoidal with respect to the parameters (Neter *et al.*, 1996) and for a two level random intercept model it takes the form:

$$\log\left(\frac{P_{ij}}{1-P_{ij}}\right) = \beta_{0ij} + \beta_1 x_{1ij} + \beta_2 x_{2ij} + \dots + \beta_p x_{pij} \quad \text{where } \beta_{0ij} = \beta_o + \mu_{oj} + \varepsilon_{oij}$$

$P_{ij}$  is probability of having a positive event for the  $i^{\text{th}}$  individual in the  $j^{\text{th}}$  cluster,

$\beta$ s are parameters of the model,

$\mathbf{X}$ s are regressors,

$\mu_j$  is the effect of cluster  $j$  on the log odd of a positive event and

$\varepsilon_{oij}$  is a level 1 residual.

This model is referred as a multilevel binary logistic regression model with a random intercept. In this study, the proposed outcome variable; that is, adolescent motherhood, is a dichotomous variable to be fitted to the model.

Intra-cluster correlation, a useful measure that may be used to evaluate the extent of level 2 variation that is due to unobserved factors operating at cluster level, is computed as:

$$\rho = \frac{\text{var}(\mu_{oj})}{\text{var}(\mu_{oj}) + \frac{\pi^2}{3}} \quad \text{where } \frac{\pi^2}{3} \text{ is the variance for the standard logistic distribution (Goldstein, 2003).}$$

MLwiN version 2.02 software is used to estimate the parameters of the models. Two approximate estimation procedures are available in MLwiN to fit multilevel models to discrete response data: marginal quasi-likelihood (MQL) and predictive quasi-likelihood (PQL). The MQL procedure will tend to underestimate the values of both the fixed and random parameters of the model, especially where the sample taken from each cluster is small. In addition, greater accuracy is obtainable if the second order Taylor series approximation, rather than the first order, is used (Goldstein, 2003). Therefore, PQL2 procedure is used to estimate the parameters of the models in this study.

The coefficients in the model can be described as the log odds for a given category of a variable over the odds for the base category of the same variable. To ease interpretation, results are expressed in terms of odds ratios, which are calculated by exponentiation the parameter estimates. A ratio greater than unity implies that an individual in a given category has more likely to have a positive event compared with a counterpart in the base category. A ratio lower than unity signals that an individual in the given category is less likely to experience the event compared with a counterpart in the base category (Neter *et al.*, 1996).

It is also worth noting that this study is heavily dependent on the information pertaining to the timing of events such as age at first birth, age at first intercourse and age at first marriage, which is not immune to errors such as memory lapses and misreporting of event (both deliberate and accidental). Readers are thus advised to cautiously interpret the results.

## Results

### LEVELS AND TRENDS IN ADOLESCENT MOTHERHOOD

The results displayed in Table 1 provide number and percentage of sampled women aged 20-49 by different socio-economic and demographic characteristics. Over three-fourth (64%) of the sampled women in EDHS 2005 were those belonging to maternal cohorts of 1970s and early 1980s. Three out of five of these women were sexually active before age 18 of which more than half of them have had sexual relations between age 15 and 17. Nearly 60% of them were victims of early marriage although the National population Policy of Ethiopia (TGE 1993) and the Family Code (FDRE 2000) states the minimum age at first marriage to be 18. A quarter of these women got married before age 15 while another third of them entered into marital life between 15 and 17 years of age. For most of the women (especially living in rural areas) first sexual intercourse and marriage date coincides as virginity still has high value and is considered as reflection of the ‘family honor’ (African Women’s Organization, 2003).

About three-fifth (59.9%) of the sampled women aged 20-49 were illiterate while those having secondary and above schooling were less than 20%. Similarly, the majority (52%) of the sampled women had no access to media radio, newspaper or TV. About half (48%) of these women follow Orthodox Christian whereas a third (33%) of them are Moslems. The majority (63%) of the sampled women was not working at the time of the survey and only 24% of those claiming to work were engaged in non-agricultural sectors (Table 2 Panel I). Most of the respondents (70%) were living in rural areas with greater proportion from Oromia, Amhara, SNNPs, and Addis Ababa.



Table 1: Number of women aged 20-49, percentage of adolescent mothers, percentage who had had sexual experience before age 18 and percentage who got married before age 18, EDHS 2005.

Variable		I	II	III	IV	V	VI
		Number of women aged 20-49	Percentage of women				
			having birth before age 20	married before age 15	married before age 18	who started sex before age 15	who started sex before age 18
Maternal age cohort	1981-1985	2617	42.9	21.1	45.1	19.4	47.2
	1976-1980	2557	52.6	27.6	55.8	25.4	58.0
	1971-1975	1754	56.2	31.3	61.5	28.6	63.7
	1961-1970	2810	56.9	32.3	64.7	30.8	67.8
	1956-1960	1080	58.7	34.3	68.6	33.1	71.7
Education	No education	7281	59.9	34.2	67.5	32.2	69.5
	Primary	2171	49.4	23.5	51.0	21.2	54.7
	Secondary +	1366	18.2	6.3	16.3	5.6	19.5
Exposure to media	Not at all	5566	59.9	33.8	67.1	31.8	69.0
	Infrequent	2544	52.0	27.9	56.6	25.5	58.6
	Frequent	2682	37.7	18.1	39.3	17.1	43.5
Religion	Orthodox	5149	51.8	33.4	58.9	32.0	62.1
	Protestant	1793	51.2	21.4	51.2	18.4	54.0
	Moslem	3529	54.2	25.1	59.3	22.8	60.4
	Others	343	53.6	28.0	58.9	28.3	62.7
Occupation	Not working	6744	55.3	29.4	60.3	27.6	62.2
	Agricultural worker	1487	61.7	39.5	71.9	37.2	73.8
	Non-agricultural worker	2566	39.9	20.1	42.9	18.2	47.2
Place of residence	Urban	3271	35.4	17.0	37.4	15.9	41.8
	Rural	7547	60.0	33.5	66.6	31.3	68.2
Region	Tigray	947	59.9	38.3	70.9	39.4	74.7
	Afar	629	49.4	27.2	60.3	26.3	62.9
	Amhara	1486	65.6	56.3	82.4	53.0	83.7
	Oromia	1696	55.7	23.4	56.6	19.4	58.9
	Somali	564	50.5	16.7	51.4	14.0	50.4
	Benishangul-Gumuz	660	69.4	45.0	78.3	42.4	78.2
	SNNP	1628	52.3	21.1	53.5	19.1	53.6
	Gambela	594	63.8	35.5	67.0	30.7	75.5
	Harari	618	40.5	13.8	42.9	12.5	43.9
	Addis Ababa	1372	27.8	12.5	27.6	12.6	33.7
Dire Dawa	624	45.5	18.8	47.0	19.6	50.2	
Marital Status	Married before age 15	3087	85.5	-	-	-	-
	Married between age 15-17	3160	77.2	-	-	-	-
	Not married before 18	4571	13.3	-	-	-	-
Sexual experience	Active before age 15	2878	83.9	-	-	-	-
	Active between age 15-17	3632	73.4	-	-	-	-
	Not active before 18	4297	13.9	-	-	-	-
<b>Total<sup>†</sup></b>		10818	52.6	28.5	57.7	26.6	60.2

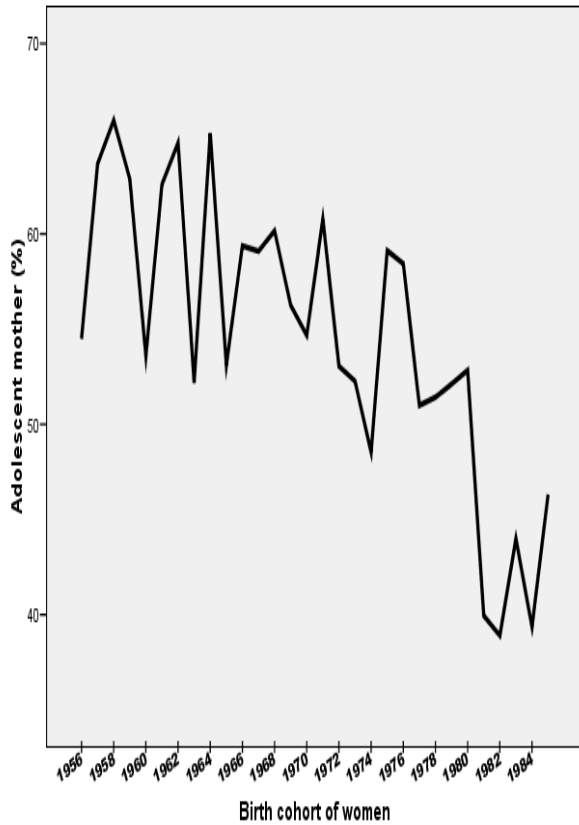
Source: Computed by the author using the 2005 EDHS.

Figure 2 presents the trend in the proportion of adolescent mothers according to birth cohorts of women. The level of teenage motherhood has shown a declining trend over 30 years preceding the survey. This could be attributed to the decline in the level of early marriage and early sexual activity among respondent women (see Table 1 panel IV and VI). As clearly observed from Figure 2, there was a slight decline in the level of teenage motherhood cohorts between 1958 and 1975 whereas the decline in the level of teenage motherhood was nearly continuous in the cohorts of 1975 and 1982.

The proportion of adolescent mothers according to birth cohorts of women's educational level showed marked difference (Figure 3). For older cohorts (earlier than 1970s), the difference in the level of adolescent motherhood among women of different educational level was smaller. However, a declining trend in adolescent motherhood was observed for cohorts beyond 1976 having a primary education. Moreover, a declining trend is observed among women with a secondary and above education from earlier time. Unlike this, the level of teenage motherhood remained to be stable at about 60% for women with no education. Women having secondary and above education reported having started sex late and giving births at relatively older ages (Table 1). This could most probably be due to the fact that they use contraceptive more effectively and efficiently than those who never been to school and have fewer education.

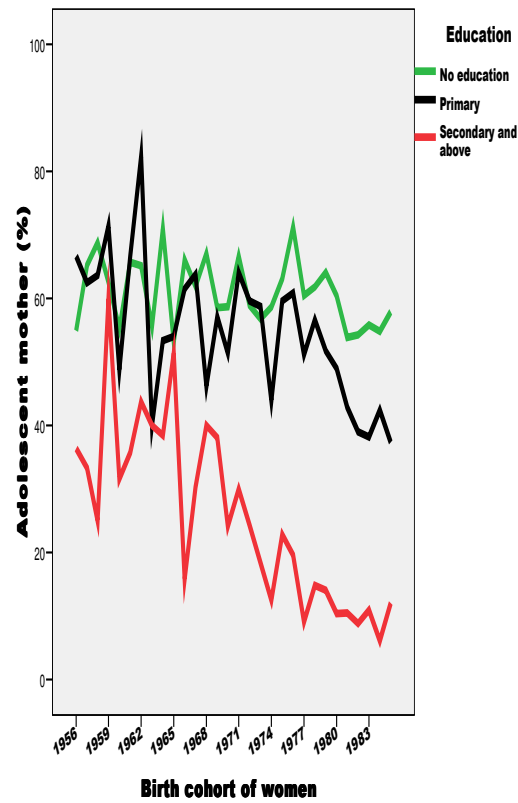
The proportion of adolescent mothers for different birth cohorts of women by type of their place of residence was shown in Figure 4. It shows a declining trend in adolescent motherhood for cohorts of women between 1958 and 1985 residing in urban areas although the level was stable at about 60% for cohorts between 1956 and 1975. It is, however, evident that the final segment of the graph signals that there is a wider gap in teenage motherhood in rural and urban areas among recent cohorts. For older cohorts, the gap in the percentage difference of teenage motherhood is, however, smaller among urban and rural residents. Availability of contraceptive use and other means of regulating pregnancy such as abortion, since recently, could be a factor contributing towards wider gap in the level of teenage motherhood in urban and rural areas of Ethiopia.

Figure 2: Line graph showing percentage of adolescent mothers across different birth cohort of women, EDHS 2005.



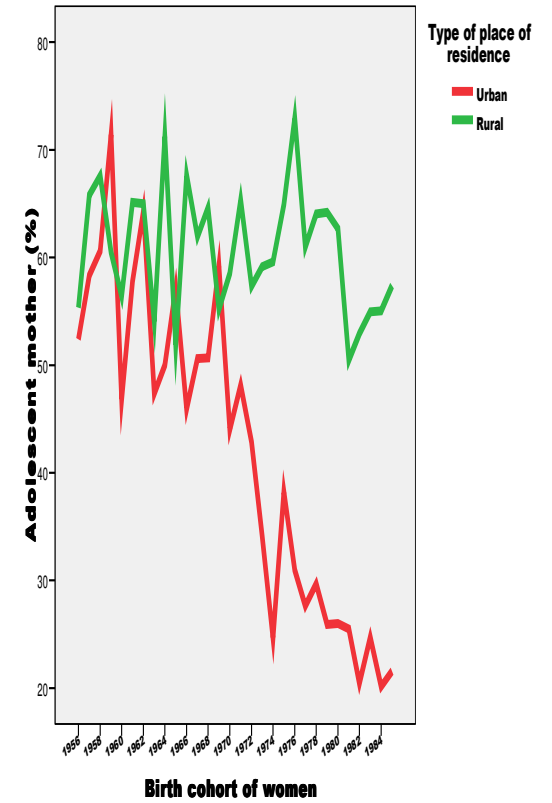
Source: Computed by the author using the 2005 EDHS.

Figure 3: Line graph showing percentage of adolescent mothers for different birth cohort of women by educational level, EDHS 2005.



Source: Computed by the author using the 2005 EDHS.

Figure 4: Line graph showing percentage of adolescent mothers for different birth cohort of women by type of place of residence, EDHS 2005.



Source: Computed by the author using the 2005 EDHS.

## DETERMINANT OF ADOLESCENT MOTHERHOOD

Variables that are believed to have both direct and indirect effect on adolescent motherhood and age of women such as education, exposure to media, religion, region (administrative) of residence, rural-urban sector and occupation of respondents are considered as background variables of control. Marital status and sexual activity status of respondents during adolescence were also included as proximate determinant variables. Since the 2005 Ethiopian Demographic and Health Survey data had not complete information on age at first use of contraception, use of family planning is not considered in this analysis. To avoid the problem of multicollinearity (Neter *et al.*, 1996) that exists between administrative region of residence and rural-urban sectors<sup>1</sup>, different models were fitted than dropping one of the collinear variables (Gujarati, 2004).

The crude effect of each of the predicting variables is also showed in the gross effect model (Table, 2). The odds of teenage motherhood among women who initiated sexual intercourse before age 15 is at least 6 times the odd of teenage motherhood among women who delayed sexual debut at later ages. Given the fact that Ethiopia is one of the developing countries where tradition persists quite highly and virginity is still considered as honor to the family (Molla, Berhane and Lindtjørn, 2008), sexual initiation and age at first marriage have strong relationship. Correlation between age first marriage and age at first sexual intercourse is found to be very high ( $r=0.866$ ,  $P<0.01$ ). Results of regression analysis also showed that the risk of being an adolescent motherhood is more than seven times higher among those women who married before age 15 than others (Table 2). About 85.5% of the women who married before age 15 were also observed having a child before age 20 (Table 1 Panel II).

Very interestingly, we observed a steady decline in adolescent motherhood among women of younger cohorts. The odds ratio estimates for birth cohorts of women indicate that the risk of teenage motherhood has progressively declined among younger cohorts and the results are statistically significant for all categories of the cohort. Controlling for the effects of other variables, the contribution of maternal age cohorts in explaining the variation in teenage motherhood was noteworthy and kept the estimates of odds ratios nearly stable.

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<sup>1</sup> Ethiopia follows a federal government system that has nine regional states and two city administrations.

**Table 2: Estimates of unadjusted and adjusted odds ratio and standard errors of parameter estimates from multilevel logistic regression model for teenage motherhood for women age 20-49, EDHS 2005.**

Variable	Gross Effect		Model I		Model II		Model III		Model IV	
	SE( $\beta$ )	OR	SE( $\beta$ )	OR	SE( $\beta$ )	OR	SE( $\beta$ )	OR	SE( $\beta$ )	OR
<b>Sexual experience</b>										
Active before 15	0.06	7.40***	0.06	6.30***	-	-	0.06	6.23***	-	-
Not active before 15 (r)	-	1.00	-	1.00	-	-	-	1.00	-	-
<b>Marital status</b>										
Married before 15	0.06	9.21***	-	-	0.06	7.84***	-	-	0.06	7.77***
Not married before 15 (r)	-	1.00	-	-	-	1.00	-	-	-	1.00
<b>Maternal age cohort</b>										
1981-1985 (r)	-	1.00	-	1.00	-	1.00	-	1.00	-	1.00
1976-1980	0.06	1.46***	0.06	1.36***	0.06	1.35***	0.06	1.38***	0.06	1.36***
1971-1975	0.07	1.68***	0.07	1.46***	0.07	1.43***	0.07	1.48***	0.07	1.43***
1961-1970	0.06	1.72***	0.06	1.42***	0.06	1.42***	0.06	1.42***	0.06	1.42***
1956-1960	0.08	1.86***	0.08	1.39***	0.09	1.39***	0.08	1.39***	0.09	1.39***
<b>Education</b>										
No education (r)	-	1.00	-	1.00	-	1.00	-	1.00	-	1.00
Primary	0.05	0.69***	0.06	0.92	0.07	0.92	0.06	0.87*	0.06	0.87*
Secondary+	0.08	0.17***	0.10	0.31***	0.10	0.32***	0.10	0.30***	0.10	0.30***
<b>Exposure to media</b>										
Not at all (r)	-	1.00	-	1.00	-	1.00	-	1.00	-	1.00
Infrequent	0.05	0.81***	0.06	1.02	0.06	1.01	0.06	1.00	0.06	0.98
Frequent	0.06	0.51***	0.07	1.02	0.08	1.03	0.07	0.99	0.07	0.99
<b>Religion</b>										
Orthodox (r)	-	1.00	-	1.00	-	1.00	-	1.00	-	1.00
Protestant	0.07	0.90	0.07	1.00	0.07	1.01	0.08	0.94	0.08	0.95
Moslem	0.06	1.08	0.06	0.98	0.06	0.99	0.07	1.03	0.07	1.04
Others	0.13	0.90	0.13	0.82	0.13	0.88	0.14	0.76	0.14	0.81
<b>Type of Occupation</b>										
Not working (r)	-	1.00	-	1.00	-	1.00	-	1.00	-	1.00
Agricultural worker	0.07	1.14	0.07	0.93	0.07	0.91	0.07	0.88	0.07	0.87*
Non-agricultural worker	0.05	0.64***	0.06	0.85**	0.06	0.84**	0.06	0.82***	0.06	0.80***
<b>Place of residence</b>										
Rural (r)	-	1.00	-	1.00	-	1.00	-	-	-	-
Urban	0.06	0.36***	0.08	0.67***	0.08	0.69***	-	-	-	-
<b>Region</b>										
Tigray	0.11	1.19	-	-	-	-	0.11	0.87	0.11	0.93
Afar	0.13	0.76*	-	-	-	-	0.12	0.57***	0.13	0.59***
Amhara	0.10	1.54***	-	-	-	-	0.10	0.85	0.10	0.80*
Oromia (r)	-	1.00	-	-	-	-	-	1.00	-	1.00
Somali	0.13	0.81	-	-	-	-	0.12	0.74*	0.13	0.76*
Benishangul-Gumuz	0.14	1.82***	-	-	-	-	0.12	1.35*	0.13	1.35*
SNNPs	0.10	0.86	-	-	-	-	0.09	0.88	0.10	0.90
Gambela	0.14	1.42*	-	-	-	-	0.13	1.30*	0.13	1.25
Harari	0.13	0.53***	-	-	-	-	0.12	0.76*	0.13	0.79
Addis Ababa	0.11	0.30***	-	-	-	-	0.11	0.52***	0.11	0.55***
Dire Dawa	0.13	0.66**	-	-	-	-	0.12	0.77*	0.13	0.84
<b>Random Parameter</b>										
Constant	-	-	0.07	0.26***	0.07	0.34***	0.09	-0.15	0.09	-0.24**
Intra-cluster variance	-	-	0.02	0.11**	0.02	0.12***	0.02	0.07***	0.02	0.09***
Intra-cluster correlation	-	-	-	0.03	-	0.04	-	0.02	-	0.03
Number of cases	10818 <sup>‡</sup>		10757		10768		10757		10768	
Joint Chi-square	-		1509.09***		1690.20***		1581.43***		1741.55***	
df	-		16		16		25		25	

- not applicable (r) reference category \*\*\* P<0.1% \*\* P<1% \*P<5% † P<10%

Source: Computed by the author using the 2005 EDHS.

Women attaining primary and secondary level education were observed to have less risk of teenage motherhood in the gross effect model but the importance of primary level education was not maintained when other variables were included in the model. The effect of secondary and above education is, however, continued to be statistically significant indicating that longer stay in the school system reduces the risk of teenage motherhood. The odds of having first birth before age 20 among women with secondary and above education is at least 68% lower than women who have no education (Table 2 Model III). Similarly, variation in the risk of adolescent motherhood is explained by rural-urban place of residence. Adolescents living in urban areas were found to have lower risk of being exposed to teenage motherhood. The odds of having birth during adolescence among women residing in urban areas at the time of the survey was at least smaller by 30% than women residing in rural place of residence (Table 3 Model I & II).

Despite controlling for the effects of education and rural-urban place of residence, women working in non-agricultural sectors were found to have lower risk of being adolescent motherhood. The odds of adolescent motherhood among women working in non-agricultural sectors were smaller by about 15% than those not working at the time of the survey. This may have implications over the decision making autonomy as working women earning income have better control over their sexuality and make decisions on the timing of having a child.

Although exposure to media has a significant association with the risk of adolescent motherhood in the gross effect model, its relevance had disappeared when other variables were introduced into the model. Religious affiliation of respondents does not appear having any effect on the adolescent's childbearing as all people following different religions in Ethiopia are bounded with the tradition of getting girls married quite early as virginity is still a prerequisite for marriage (Seyoum and Desta, 1998; Dagne, 1994).

Region of residence that could serve as proxy indicator of cultural diversity in the country for the governance structure of the nation is based on ethnic federalism (Habtu, 2003), shows some variation in adolescent motherhood. In Afar and Somali regions where marriage is often arranged by the family members and endogamy is commonly practiced, the risk of teenage motherhood is relatively lower both in the gross and net effect models. This could be due to predetermined

marital relations and strict observation of girl's sexual life, sexual initiation and pregnancy appear to take place at later ages. Unlike this, high risk of adolescent motherhood is observed in Benishangul Gumuz and Gambella regions where a significant proportion of girls initiate sexual relations at puberty (Table 1). Amhara region where early marriage is common (Dagne, 1994) have shown a higher risk of teenage motherhood in the gross effect model but inconsistent results were obtained when other variables were introduced in the model. This could be due to the highest rate of marital instability in the region (Pankhrust, 1992; Tilson and Larsen 2000) that would reduce the risk of pregnancy as a result of interrupted regular sexual exposure.

## **DISCUSSIONS**

Results of this study showed that a number of factors such as early marriage and sexual initiation, attainment of secondary and above education, urban place of residence, women's occupation as a proxy of their decision making autonomy and limited access to contraceptive use are determinants of adolescent motherhood in Ethiopia. In conformity with studies made in different parts of the world, early childbearing is more likely taking place among socially-disadvantaged adolescents than their better of peers (Buvinic, 1998; Sing *et al.*, 2001). Following are discussions of results obtained in the earlier parts.

### ***Adolescent motherhood is a function of early marriage that leads to early sexual relationships:***

Though early marriage and early sexual initiation has shown a declining trend over time, their contribution to teenage motherhood is immense. Traditional influences to get girls married at early ages before they engage in premarital sexual relations is one of the major factors contributing to teenage motherhood. Apart from ensuring that their daughters have got married early, parents are also eager to see them giving birth for a child shortly to ensure the stability of marriage (Dagne, 1994). A married woman gains recognition and acceptance among the in-laws if she starts bearing a child and proves herself that she is 'fertile'. In most of the Ethiopian traditional societies, a marriage is not often conformed until a child is born to authenticate the unification (Ezra and Gurmu, 2002). A study done in Brazil and Colombia (Cesare and Rodriguez, 2006) also indicated that women who had had their first union before age 18 are at higher risk of adolescent childbearing than their counterpart. The universal nature of adolescent

motherhood as a result of early marriage in a number of developing countries has also been attested by Singh (1998).

***Low level of contraceptive use is contributing to the highest risk of adolescent motherhood:***

Another factor for the highest rate of teenage motherhood in Ethiopia soon after marriage is the low level of contraceptive prevalence rate in the country. Contraceptive prevalence rate was 2.8% in 1990 (CSA, 1993) showing a slight increase to 8.1 in 2000 (CSA and ORC Macro, 2001) and 14.6 in 2005 (CSA and ORC Macro, 2006). The rate in rural areas where the majority of the population is living and exposed to the risk of early marriage is lower than the level indicated above.

***Attainment of secondary level education reduces the risk of adolescent motherhood:***

As the main purpose of education is to produce people who can deal with problems encountered at home and at places of work, the risk of adolescent motherhood is quite lower among those attaining secondary level education. This could of course be due to avoiding unprotected and unsafe sexual relations through the use of modern contraceptives as evidenced in the findings of studies done in Brazil (Gupta & Leite, 1999) and in other eight sub-Saharan African countries (Gupta and Mahy, 2003) and/or avoiding the risk of entering into marital life at early ages (Ainsworth *et al*, 1996; McDevitt *et al*, 1996). As clearly illustrated in the works of Bongaarts (1978), a social consequence of education is to adapt to modern attitudes and values that reduces any sort of traditional hazards dictating women to have more children and quite early. Poorly designed and swiftly analysis of Atta (2002), however, indicated a contradictory result indicating that education had no influence on teenage pregnancy or motherhood.

***Enhanced women's autonomy and their decision making power seems to delay timing of first birth:***

Among women having access to fertility regulating mechanisms, the decision to have birth and getting pregnant may not necessarily correlate with exposure to the risk of frequent and regular sexual relations. An autonomous woman can avoid unwanted and unplanned pregnancies even if she is at the risk of conception using effective and efficient contraceptive supplies and/or terminating the pregnancy. Women working in non-agricultural sector are believed to have a better decision making power about their sexuality and timing of birth than their counterparts



who are totally or partially dependent on their partners. The former is believed to have better exposure to modernization elements in which career development and professionalism is preferred to having a child to get recognition in the society. Economic self sufficiency may also trade off the influences of traditional norms and values to be motherhood as much early as possible.

***Recent decline in adolescent motherhood is a signal of change due to community-based interventions:*** Results of this study have shown that adolescent motherhood had declined over time. The decline in teenage motherhood for cohorts between 1975 and 1982 was considerable and continuous than others. Surprisingly, the tremendous decline in the level of adolescent motherhood was observed in the periods following the adoption of the National Population Policy of Ethiopia that aimed at increasing the minimum age of marriage to be 18 years and reduction of fertility through different ways including provision of modern contraceptive supplies to all women of reproductive ages, providing more opportunities for girl's education, and the like. Supporting this argument, a study conducted by the Family Health International (2004) on youth reproductive health programs in Ethiopia gave due recognition to the strong efforts and measures taken by the Ethiopian government and the international community to improve the situation. Had the policy been adopted earlier and similar practices were in place, the risk of teenage motherhood among older cohorts of women might not have been higher. The different risks of teenage motherhood observed among different adolescents lived in different African countries have also shown noticeable variation and decline over time (see also Manlove et al, 2000). The different experiences among the different cohorts could often be attributed to the differences in the volume of interventions exerted in different periods.

### ***Conclusions***

This study attempts to investigate the levels, trends, differentials and determinants of adolescent motherhood in Ethiopia using data from the 2005 EDHS survey. Results of the study revealed that adolescent motherhood is declining since recently but at varying degree among different groups. The risk of being an adolescent mother is lower among those attaining secondary and above education, those living in urban areas where means to avoid unwanted and unplanned pregnancies are widely available and traditional norms and values have little influence on having

a child among newly-wed mothers soon after marriage, and those who can protect their own interest and make decisions on their own. Worst of all, adolescent motherhood is the highest among disadvantaged women (i.e., illiterate, not working and living in rural settings) who got married at early ages and exposed to sexual relations upon marriage. Limited access to contraceptive use particularly in rural areas is also believed to expose such young women to early pregnancy and teen motherhoods. Millions of Ethiopian girls are still at the stake of early pregnancy and adolescent motherhood that has severe health, psychological, economic and, social hazards.

Widening educational and employment opportunities for young girls and implementing the minimum age at first marriage with strong legal enforcement besides excessive campaign to change the attitude of the community to postpone the wedding of young girls at maturity is expected to reduce the psycho-social, health and economic catastrophe of young mothers. This issue calls for wider intervention of the government, non-government and civil societies to bring about radical changes aimed at the betterment of young women having the brightest future.

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