

ORIGINAL ARTICLE

## TRENDS AND DETERMINANTS OF MODERN CONTRACEPTIVE USE AMONG CURRENTLY MARRIED WOMEN IN AMHARA NATIONAL REGIONAL STATE OF ETHIOPIA

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### ABSTRACT

*Ethiopia is the second most populous country in Africa with high fertility and fast population growth rate. It is also one of the countries with high maternal and child mortality rate in sub-Saharan Africa. Hence, family planning is a crucial strategy to halt this problem. The overall trends of modern contraceptive use dramatically increased in Amhara National Regional State, from 6.6% in 2000 to 15.7% in 2005 and 33.0% in 2011, although still relatively very low. This study, therefore, examined the trends and determinants of current modern contraception among currently married, non-pregnant women of reproductive age in the region using the 2000, 2005 and 2011 Ethiopia Demographic and Health Surveys. The analysis was based on 2587, 2330, and 2776 women of reproductive age, for the 2000, 2005, and 2011 surveys, respectively. Data management and analysis were carried out using STATA 13. Multivariate analysis of binary logistic regression was employed for each survey. The findings indicate that women living in rural areas had less likelihood of modern contraceptive use in 2000 (AOR = 0.260, 95% CI = 0.0843-0.801) and 2005 (AOR = 0.396, 95% CI = 0.203-0.771). The effect of wealth was more pronounced in 2005 (AOR = 1.906, 95% CI = 1.165-3.118) and in 2011 (AOR = 1.653, 95% CI = 1.173-2.329). The likelihood of contraceptive use among employed women was higher in 2005 (AOR = 1.989, 95% CI = 1.298-3.049) and in 2011 (AOR = 1.441, 95% CI = 1.072-1.939). Older women were less likely to use contraception as opposed to younger women in 2000 (AOR = 0.0673, 95% CI = 0.0140-0.322) and in 2011 (AOR = 0.296, 95% CI = 0.125-0.700). In conclusion, residence, wealth quintiles, employment status, women's current age, and child mortality were significantly associated with the use of modern contraceptives during 2000-2011 in the region. The regional health bureau and concerned stakeholders should focus on empowering women economically, integrating family planning into maternal and child health services, and accessing services to youths' and in rural areas to accelerate contraception in the region.*

**Keywords:** Modern contraceptives, current use, trends, differentials, determinants, currently married, Amhara, Ethiopia.

### 1. INTRODUCTION

Reducing high fertility and slowing population growth provided the dominant rationale for family planning programs in the 1960s and 1970s

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(Seltzer, 2002). The rationale was based on concerns over the potentially negative effects of rapid population growth and high fertility on living standards and human welfare, economic productivity, natural resources, and the environment in the developing world (Bongaars et al., 2012).

More than 225 million women and girls in developing countries who want to delay or stop childbearing lack access to contraceptives, information, and services in 2015 (World Health Organization, 2015). In 2012 the worldwide rate of unintended pregnancy was about 53 per 1,000 women aged 15-44 with the highest regional rate in Africa 80 per 1,000 women (Sedgh et al., 2014; World Health Organization, 2015). In Ethiopia, about 29% of women of reproductive age feel their pregnancies are mistimed or unwanted (Central Statistical Agency [Ethiopia] & ICF International, 2012).

Avoiding barriers to contraceptive utilization could avert 54 million unintended annual pregnancies globally (Bongaars et al., 2012; Jacob et al., 2008) that could contribute significantly to improving the social and economic situation of women through preventing unintended pregnancies (Frank and Bongaarts 1991). By providing contraceptives to women who desire to use it, maternal deaths can be reduced by as much as one-third through avoiding pregnancy at the extremes of maternal age that minimizes risks by decreasing parity. If all women had five births or fewer, the number of maternal deaths could drop by 26% worldwide (Rama et al., 2003; Ahmed, 2012; Cleland et al., 2012; Singh, 2012; World Health Organization, 2015).

On the other hand, family planning indirectly contributes to children's health, development, and survival. Spacing births at least two years apart has to do with their survival. On average, babies born less than two years after the previous birth in the family are about twice as likely to die in the first year as babies born after at least a two-year interval. Even older children who are spaced too closely face an increased risk of death during the toddler and childhood years. Planning births during the mother's optimal age -not too old or too young- as women who are very young or very old are more likely to have an infant or child death (Cleland et al., 2012). Accessing family planning can reduce infant mortality by 10% and childhood mortality by 21% (Cleland et al., 2012) and one million infant deaths each year (World Health Organization, 2015).

However, the modern contraceptive prevalence rate in Ethiopia is still relatively very low, even with an increasing trend over the last decade from a low of 8.2% in 2000 to 14.7% in 2005 and to 28.6% in 2011 among currently married women of age 15-49. The overall trends of modern contraceptive use in Amhara National Regional State also increased dramatically since 2000 from 6.6% to 15.7% in 2005 and to 33.0% in 2011 (Central Statistical Agency & ORC Macro, 2001, 2006; Central Statistical Agency & ICF International, 2012).

The available survey-based studies on trends and determinants of contraception in Ethiopia were not region-specific that most of them were carried out at national level in which the results might had been affected by

the problems of aggregation bias (Teller & Assefa, 2011; United Nations Population Fund, 2012; Abebaw et al., 2015; Hailu, 2015). Others were also focused on specific areas of regions which could not represent those regions' population (Abdurahman, 2014; Tesfalidet, 2015; Ewnetu, 2015; Feleke, 2017). The effects of demographic and socioeconomic variables in Amhara region on contraceptive use vary from area to area as it is highly diversified. The specific factors that explain the course of contraceptive transition in the region during the last decade and their relative contribution were not well investigated. A proper understanding of the trends and differentials of contraceptive use among currently married women of reproductive age and associated factors are of paramount importance which paves the way for the improvement of the prevailing socioeconomic problems of the region. Therefore, the purpose of the present study was to examine the trends and determinants of current modern contraceptive use among currently married but non-pregnant women of reproductive age (15-49) in the region between 2000 and 2011.

## **2. RESEARCH METHODS**

### **2.1 Data Sources**

The main data sources for the present study were the 2000, 2005, and 2011 Ethiopian Demographic and Health Surveys which are parts of the worldwide Measure Demographic and Health Survey project and funded by the United States Agency for International Development (USAID). The Ethiopia Demographic and Health Surveys (EDHSs) used standardized questionnaires targeted women with reproductive age group.

### **2.2. Study Design**

The EDHSs collected data through nationally representative cross-sectional surveys. The sample for all the three Ethiopia Demographic and Health Surveys were based on a two-stage stratified cluster design after stratifying each region into urban and rural areas. The primary sampling unit was the Enumeration areas which were systematically selected with probability proportional to enumeration area size (EA). An EA is a geographic area that covered on average 181 households. Households comprised the second stage of sampling. A complete listing of households was carried out in each of the selected EAs. A representative sample of 2059, 2158, and 2163 households were selected for the 2000, 2005, and 2011 survey respectively in Amhara National Regional State. In 2000, 2005, and 2011 Ethiopia Demographic and Health Surveys in the region, a total of 3820, 3391, and 4433 women of reproductive age were successfully interviewed respectively. Details of the study design for these surveys can be obtained from CSA (Central Statistical Agency [Ethiopia] and ICF International, 2012).

### **2.3. Data Analysis Techniques**

Data management and analysis were carried out using STATA 13. Both descriptive and multivariate analyses were weighted for the sampling probabilities and non-responses using the weighting factor included in the Ethiopia Demographic and Health Survey data. Determinants of current modern contraceptive use were examined using Multivariate Binary Logistic Regression model for each survey separately.

## 2.4. Model Variables and Measurements

The response variable in this analysis is the current modern contraceptive use dichotomized as user and non-user of contraceptive methods, categorized dichotomously as a “Yes/No” variable. Respondents who were currently using a modern contraceptive method were categorized as “Yes,” otherwise as “No.” The level of modern contraceptive use is a measure of actual modern contraceptive practice at the time of the survey among married, non-pregnant women of reproductive age.

The explanatory variables are women’s current age (15-19, 20-24, 25-29, 30-34, 35-39, 40-44, 45-49); residence (rural, urban); religion (Orthodox, Muslim, others); wealth index (poor, middle, rich); women and their partners’ educational level (no education, primary education, secondary and above education); employment status (employed, unemployed); children surviving (0, 1-2, 3-4, 5-6, 7); experience of child death (0, 1, 2, 3, 4+); reproductive intentions (0, 1-2, 3-4, 5+); and listen to radio (not at all, infrequent, frequent).

## 3. RESULTS

### 3.1 Background Characteristics of Respondents (2000-2011)

Table 1 showed percentage distribution of currently married women of reproductive age in the region by their background characteristics across the three surveys. The majority of currently married women were sampled from the rural areas in the three surveys (ranged from 93.1% to 82.8%). The proportion of residing in the urban areas had shown an increasing trend, from 6.9% in 2000 to 17.2% in 2011. As can be seen in the same Table, there was substantial improvement in women’s education from 2000 to 2011 surveys. This is, particularly, the case for primary education increased significantly from 8.1% in 2000 to 18.1% in 2011. But there has not been a similar trend in the proportion of women with secondary or higher education. Educational attainment has risen for the partners but the improvement is mainly seen in primary education, from 13.5% in 2000 to 26.2% in 2011.

The wealth index uses to indicate inequalities in household characteristics, use of health and other services. It serves as an indicator of wealth consistent with expenditure and income measures. Over the last decade, a relatively high percentage of married women of the region were in the low wealth quintile and showed a decreasing trend (51% in 2000 to 36.7% in 2011). In contrast, significant proportions of currently married women of the region were in the highest wealth quintile (30.6% in 2000 and 33.4% in 2011). On the other hand, women’s employment patterns over the last decade were not a clear trend. In 2000, 28.4% of the women reported that they were employed, but it declined to 24.3% in 2005. By 2011, there was a reversal trend in that 29.6% women were employed.

Listening to a radio is the most common way of accessing the media. Nevertheless, one for every five women listened to the radio at least once a week in 2011 with a significant change of more than four-fold since 2000. In terms of religious affiliation, both surveys indicate majority of the respondents (83%) were Christians while the rests (17%) were Muslims.

There was no a significant change in the proportion of respondents by religion across the three surveys.

In each survey, about 50% of currently married women were in the younger age groups, under the age of 30. In general, the three surveys indicate the proportion of women in each age group declines as age of the participants' increase reflecting the comparatively young age structure of the population in the region, which is a result of high fertility in the past. Over 30% of married women reported of having 5 or more living children in 2011 and this remained nearly unchanged since 2000. The proportion of women who reported four or more dead children declined slightly from 4.8% in 2000 to 3.0% in 2011 while the proportion of women who reported none of child died increased from 54.4% in 2000 to 64.1% in 2011.

Data on reproductive intentions are useful indicator of general fertility attitudes and the possible future course of fertility. Reproductive intentions data also facilitate the assessment of the need for family planning methods and the extent of unwanted fertility. The data on reproductive intentions revealed nearly one-third of the currently married women in the three surveys desired to have 5 or more children in the future with no sign of a decline over the last decade. The proportion reported 1-2 and 3-4 children increased from 5.9% in 2000 to 7.9% in 2011 and 29.3% in 2000 to 38.6% in 2011, respectively. Overall, trends in reproductive intentions indicate high fertility desire in the future has been an apparent

Table 1: Percentage of currently married women age 15-49 and modern contraceptive prevalence rate (MCPR) by background characteristics in Amhara National Regional State, Ethiopia: 2000, 2005, and 2011

Variables & categories	Respondents (%)			MCPR (%)			Absolute percentage change in MCPR		
	2000	2005	2011	2000	2005	2011	2011-2005	2005-2000	2011-2000
<i>Residence</i>									
Urban	6.9	6.5	17.2	28.6	44.3	50.4	13.8	54.9	76.2
Rural	93.1	93.5	82.8	5.0	13.7	29.4	114.6	174.0	488.0
<i>Woman's education</i>									
No education	89.2	85.3	77.1	4.8	13.7	30.0	119.0	185.4	525.0
Primary	8.1	10.6	18.1	15.1	18.7	38.9	108.0	23.8	157.6
Secondary+	2.8	4.1	4.8	42.1	49.6	58.8	18.5	17.8	39.7
<i>Partner's education</i>									
No education	81.9	76.4	67.6	5.0	12.7	28.6	125.2	154.0	472.0
Primary	13.5	15.8	26.2	7.7	19.1	41.0	114.7	148.1	432.5
Secondary+	4.6	7.9	6.1	32.4	38.5	47.1	22.3	18.8	45.4
<i>Wealth quintiles</i>									
Poor	51.0	36.7	43.9	4.6	9.3	24.2	160.2	102.2	426.1
Middle	18.5	23.5	22.8	3.0	15.2	33.6	121.1	406.7	1020.0
Rich	30.6	39.8	33.4	12.2	21.9	44.2	101.8	79.5	262.3
<i>Listen to radio</i>									
Not at all	82.2	67.7	45.4	5.0	13.1	26.3	100.8	162.0	426.0
Infrequent	12.1	19.0	32.2	13.7	17.6	35.9	104.0	28.5	162.0
Frequent	5.7	13.3	22.5	15.9	26.7	42.7	59.9	67.9	168.6
<i>Religion</i>									
Christians	82.5	83.5	83.8	5.4	15.5	32.6	110.3	187.0	503.7
Muslims	17.5	16.5	16.2	12.4	17.2	34.9	102.9	38.7	181.5
<i>Employment status</i>									

phenomenon among married women of the region.

Table 1: (Continued)

Variables & categories	Respondents (%)			MCPR (%)			Absolute percentage change in MCPR		
	Survey year 2000	2005	2011	Survey year 2000	2005	2011	2011-2005	2005-2000	2011-2000
Unemployed	71.6	75.7	70.4	6.2	12.6	29.7	135.7	103.2	379.0
Employed	28.4	24.3	29.6	6.8	25.3	40.9	61.7	272.1	501.5
Current age									
15-19	11.6	10.5	9.5	4.8	9.5	34.2	260.0	97.9	612.5
20-24	17.2	17.8	16.8	3.6	18.8	35.0	86.2	422.2	872.2
25-29	20.5	20.7	20.4	10.5	16.4	38.8	136.6	56.2	269.5
30-34	13.5	14.7	16.1	7.8	17.5	39.7	126.9	124.4	409.0
35-39	15.7	14.8	15.4	7.7	20.2	32.9	62.9	162.3	327.3
40-44	10.4	11.5	11.2	7.4	14.8	23.3	57.4	100.0	214.9
45-49	11.2	10.1	10.6	2.6	7.2	17.7	145.8	176.9	580.8
Children surviving									
None	11.4	10.8	12.9	3.0	11.4	30.8	170.2	280.0	926.7
1-2	31.8	29.7	30.9	5.9	15.4	37.5	143.5	161.0	535.6
3-4	25.6	29.2	24.6	8.1	18.1	38.4	112.2	123.5	374.1
5-6	20.3	19.2	18.9	7.4	14.3	25.5	78.3	93.2	244.6
7+	10.8	11.2	12.7	7.7	16.9	25.1	48.5	119.5	226.0
Experience of child death									
None	54.4	58.7	64.1	6.4	18.2	38.9	113.7	184.4	507.8
1	21.9	22.2	19.9	6.6	15.8	25.8	63.3	139.4	290.9
2	13.0	9.9	8.9	7.4	7.7	18.2	136.4	4.1	145.9
3	5.9	5.7	4.2	3.0	8.5	21.5	152.9	183.3	616.7
4+	4.8	3.5	3.0	12.6	7.2	15.6	116.7	-42.9	23.8
Reproductive intentions									
None	4.2	12.1	5.5	15.3	13.7	33.8	146.7	-10.5	120.9
1-2	5.9	6.1	7.9	3.8	21.5	41.2	91.6	465.8	984.2
3-4	29.3	29.7	38.6	10.6	20.0	38.9	94.5	88.7	267.0
5+	35.7	43.3	35.1	5.5	13.4	24.9	85.8	143.6	352.7
Non-numeric	24.9	8.9	13.0	2.8	11.3	32.0	183.2	303.6	1042.9
Number of observations									
Unweighted	1,314	1,281	1,310						
Weighted	2,587	2,330	2,776						
Total (%)	100.0	100.0	100.0	6.6	15.7	33.0	110.2	137.9	400.0

Sources: Calculated from 2000, 2005 and 2011 Ethiopia Demographic and Health Survey data.

### 3.2. Differentials of Current Modern Contraceptive Use

Table one also showed the differentials of contraceptive use in the region across the three surveys. Modern contraceptive use increased both in rural and urban areas since 2000. However, the largest increment is observed in rural areas. In 2000, the rural prevalence was very low that accounted to 5.0%. In 2005, this has increased significantly to 13.7% and by 2011 the

rate reached 29.4%. The urban prevalence of 28.6% in 2000 has also increased significantly to 50.4% in 2011. But most of the increment in the urban areas has occurred during the first-half of the decade (an absolute change of 54.9% during 2000-2005 and 13.8% 2005-2011).

The proportion of women using any modern contraceptive method increased with their educational level in each survey. The gap between users who attended secondary and above school and those who never attended any type of schooling is enormous in the three surveys in both cases. However, the faster increase in the use of any modern contraceptive method over the last decade is observed among women with no education (more than five-fold of an absolute change). Later, those with no education continued to increase at an ever-faster pace. This is also true when the education of their partners is considered.

The relationship between religion and any modern contraceptive use of the region indicates a higher proportion of women with those of Muslim religion followers are more likely to use any modern methods than Christians in the three surveys and increased over time. However, the gap between Muslim women and Christian women who had been using any modern methods has narrowed substantially overtime from 7% difference in 2000 to 2% in 2011.

Differences in contraceptive practice by wealth index shows a clear tendency of increase in the use of modern contraception. Contraceptive prevalence surpassed above 21.9% for those women from wealthier households in 2005 from 12.2% in 2000. There is also an increase in contraceptive prevalence (reached 44.2%) during the latter period for those women from wealthier households. During this period, contraceptive prevalence for those women from poor households is also more than double (9.3% in 2005 and 24.2% in 2011). The possible mediating factors between women's work status and their contraceptive use, irrespective of their likely higher education, may include exposure to a network of peers with positive attitude towards small family, family planning methods and competing time demand for child care that may work against large family thereby increased their receptiveness to family planning.

Between 2000 and 2011, there has been progress in the use of modern methods across the three surveys by work status of women. In the last decade, the absolute change in contraceptive use is more than five-fold for those women who employed from 6.8% in 2000 to 40.9% in 2011. For unemployed women, the absolute change is more than double in the first-half of the decade and continued to rise in the later period.

The prevalence of any modern contraceptive use by age group increased only slightly in the first period and then increased further thereafter. Although the level of any modern contraceptive use increased overtime, the pattern of any modern contraceptive use by age is similar across the three surveys. In all age groups, the use of contraception increases from 2000 to 2011, but relatively lower increase was observed among the last age groups, 40-44 and 45-49.

The proportion of women who use modern contraception increased with the number of surviving children in each survey. The change in contraceptive use among women with 7 and more surviving children was more than three-fold (7.7% in 2000 and 25.1% in 2011); however, the largest change is observed for those women with no surviving children (more than nine-fold in the 11-year span) and women with 1-2 surviving children (more than seven-fold in the 11-year span). On the other hand, the use of modern methods has declined with the increase in child-loss across the three surveys. The increase in modern contraceptive prevalence is especially pronounced for those women who lost none of their children (from 6.4% in 2000 to 18.2% in 2005 and 38.9% in 2011). However, the prevalence of any modern contraceptive use for women who lost 4 or more children declined from 12.6% in 2000 to 7.2% in 2005 and increased to 15.6% in 2011.

As to the desire to have additional children, contraceptive use downward with the increasing of desire to have additional children in each survey, but increased from 2000 to 2011 and the largest increase was for those women who desired 1-2 children from 3.5% in 2000 to 21.5% in 2005 and 41.2% in 2011.

### **3.3 Determinants of Current Modern Contraceptive Use**

Table 2 shows the odds ratios of factors influencing current modern contraceptive use among currently married women during the 2000, 2005 and 2011 surveys in the region. The regression models control for current age, residence, woman and her partner's education, work status, religion, wealth index, under-five mortality, child-survival, reproductive intentions, and exposure to mass media. Among the characteristics of women in union considered to have a predictive power on contraception, listen to radio as well as child-survival do not seem to have a statistically verifiable relationship with current modern contraceptive use across the three surveys in the region.

Place of residence has significantly influenced the use of modern contraceptive methods among currently married women. Rural women seem to have a less likelihood of modern contraceptive use as compared to urban residents during the 2000 survey (AOR = 0.260, 95% CI = 0.084-0.801) and the 2005 survey (AOR = 0.396, 95% CI = 0.203-0.771).

During the 2000 survey, married women with secondary or higher education are nearly eight times more likely to use modern contraceptive methods compared to women with no schooling (AOR = 7.531, 95% CI = 2.587-21.920) other variables held constant. The chance of using modern contraception for women who had a partner with a secondary and above level of education is increased by more than two-fold (AOR = 2.465, 95% CI = 1.115-5.451) as compared to women whose partner with no formal schooling in the same period.

Household wealth significantly influenced contraceptive use among currently married women in the two most recent surveys. The effect is more pronounced in 2005 where the likelihood of using contraception is about



90.6% (AOR = 1.906, 95% CI = 1.165-3.118) and 65.3% higher in 2011 (AOR = 1.653, 95% CI = 1.173-2.329) for women residing in rich households compared to the poor.

Employment status of married women played a role in determining the likelihood of contraceptive use. The likelihood of using modern contraceptives is higher by 98.9% in 2005 (AOR = 1.989, 95% CI = 1.298-3.049) and 44.1% (AOR = 1.441, 95% CI = 1.072-1.939) in 2011.

The relationship between age of a woman and contraceptive use has been observed to be inversed. Older women (45-49) are less likely to use contraception as opposed to younger women in the 2000 survey (AOR = 0.067, 95% CI = 0.014-0.322) and in the 2011 survey (AOR = 0.296, 95% CI = 0.125-0.700). It can also be noted the effect measure, odds ratio of modern contraception progressively declines with age after the effect of other demographic and socioeconomic factors is controlled.

The 2000 survey indicates reproductive intention decreases the use of contraception. Women with a fertility desire of 5 and more children are 75.0% less likely to use contraception compared to those who do not want to have an additional child in the future (AOR = 0.250, 95% CI = 0.083-0.758). On the other hand, in the 2011 survey, women who lost more than four children are 74.3% less likely to use contraceptive methods than women who did not experience any child death (AOR = 0.234, 95% CI = 0.296-16.860).

Table 2: Odds ratios of factors influencing modern contraceptive use among currently married women in Amhara National Regional State, Ethiopia: 2000, 2005, and 2011

Variables & categories	Survey year					
	AOR	95% CI	AOR	95% CI	AOR	95% CI
<i>Residence</i>						
Urban [RC]	1.000	[1.000,1.000]	1.000	[1.000,1.000]	1.000	[1.000,1.000]
Rural	0.260*	[0.084,0.801]	0.396**	[0.203,0.771]	0.728	[0.486,1.092]
<i>Woman's education</i>						
No education [RC]	1.000	[1.000,1.000]	1.000	[1.000,1.000]	1.000	[1.000,1.000]
Primary	2.463*	[1.192,5.091]	0.901	[0.487,1.668]	0.994	[0.595,1.659]
Secondary+	7.531**	[2.587,21.920]	1.378	[0.482,3.938]	1.493	[0.361,6.176]
<i>Partner's education</i>						
No education [RC]	1.000	[1.000,1.000]	1.000	[1.000,1.000]	1.000	[1.000,1.000]
Primary	1.145	[0.505,2.596]	1.298	[0.831,2.027]	1.177	[0.870,1.592]
Secondary+	2.465*	[1.115,5.451]	1.474	[0.716,3.035]	0.803	[0.271,2.383]
<i>Wealth quintiles</i>						
Poor [RC]	1.000	[1.000,1.000]	1.000	[1.000,1.000]	1.000	[1.000,1.000]
Middle	0.869	[0.314,2.406]	1.860*	[1.101,3.144]	1.540*	[1.066,2.224]
Rich	1.512	[0.729,3.136]	1.906*	[1.165,3.118]	1.653*	[1.173,2.329]
<i>Religion</i>						
Christians [RC]	1.000	[1.000,1.000]	1.000	[1.000,1.000]	1.000	[1.000,1.000]
Muslims	2.515**	[1.270,4.979]	1.235	[0.715,2.134]	1.368	[0.824,2.271]
<i>Employment status</i>						
Unemployed [RC]	1.000	[1.000,1.000]	1.000	[1.000,1.000]	1.000	[1.000,1.000]
Employed	1.676	[0.987,2.845]	1.989**	[1.298,3.049]	1.441*	[1.072,1.939]

Table 2: (Continued)

Variables & categories	Survey year 2000		2005		2011	
	AOR	95% CI	AOR	95% CI	AOR	95% CI
<i>Current age</i>						
15-19 [RC]	1.000	[1.000,1.000]	1.000	[1.000,1.000]	1.000	[1.000,1.000]
20-24	0.337	[0.104,1.087]	1.604	[0.754,3.409]	0.694	[0.378,1.273]
25-29	0.619	[0.243,1.575]	1.237	[0.527,2.903]	0.720	[0.400,1.293]
30-34	0.242*	[0.082,0.715]	1.245	[0.510,3.037]	0.828	[0.426,1.609]
35-39	0.222*	[0.061,0.711]	1.657	[0.671,4.093]	0.604	[0.303,1.204]
40-44	0.151*	[0.036,0.632]	1.033	[0.355,3.004]	0.358*	[0.151,0.850]
45-49	0.067**	[0.014,0.322]	0.506	[0.127,2.011]	0.296*	[0.125,0.700]
<i>Experience of child death</i>						
None [RC]	1.000	[1.000,1.000]	1.000	[1.000,1.000]	1.000	[1.000,1.000]
1	0.864	[0.386,1.935]	0.887	[0.570,1.379]	0.570*	[0.361,0.899]
2	1.013	[0.377,2.724]	0.589	[0.235,1.475]	0.342*	[0.179,0.653]
3	0.305	[0.062,1.508]	0.827	[0.262,2.616]	0.405*	[0.200,0.818]
4+	0.234	[0.296,16.860]	0.832	[0.236,2.931]	0.257	[0.064,1.043]
<i>Reproductive intentions</i>						
None [RC]	1.000	[1.000,1.000]	1.000	[1.000,1.000]	1.000	[1.000,1.000]
1-2	0.228	[0.047,1.114]	1.658	[0.714,3.854]	1.091	[0.586,2.029]
3-4	0.474	[0.154,1.457]	1.484	[0.797,2.763]	1.040	[0.630,1.716]
5+	0.250*	[0.083,0.758]	1.079	[0.565,2.063]	0.650	[0.380,1.113]
Non-numeric	0.150**	[0.037,0.607]	0.959	[0.408,2.255]	1.082	[0.618,1.893]
Number (Weighted)		2,587		2,330		2,776

Significant level: \*\*p< .01, \*p<.05.

Note: RC = Reference Category, CI = Confidence Interval, AOR = Adjusted Odds Ratio.

Sources: Calculated from 2000, 2005 and 2011 Ethiopia Demographic and Health Survey data.

#### 4. DISCUSSION

In comparison with different demographic and socioeconomic characteristics of currently married women age 15-49, those living in urban areas have highest modern contraceptive prevalence in the 11-year span. Urban women were more likely to use contraception than the rural counterparts. There are unmeasured channels that could influence contraceptive use in urban areas such as better access to services and psychosocial factors may be related to the urban way of life. The differential risk ratios in contraceptive use between urban and rural areas declined from 74.0% in 2000 to 27.2% in 2011 (an absolute change of nearly three-fold). However, other studies in sub-Saharan African countries had different findings. Brass and Jolly (1993) find women residing in urban centres are less likely to use contraception than women in rural areas. They argue, once other variables known to influence contraceptive use are

controlled, there is nothing about urbanization itself is significant in increasing contraceptive use and in fact it can be a negative influence. Furthermore, Bertrand et al. (1993) reveal living in a major city had little or no direct effect on modern contraceptive use.

Although trends from 2000 to 2011 showed a significant increase in contraceptive use in rural areas of the region where 84% of the population still lives, but this may be due to the deployment of the Health Extension Workers (HEWs) in each rural kebele of the region and the corresponding diffusion effects brought by such new endeavours (Ministry of Health, 2007). Moreover, as part of the Health Extension Program (HEP), the construction of health posts in the rural areas of the region increased from 2,075 in 2006 and 2,941 in 2011, as a result of which family planning and other primary health care services have become more closer to the community than ever means health post-population ratio increased from 1:9,216 in 2006 to 1:5,371 in 2011 met 1:5,000 standard of Ministry of Health (Ministry of Health, 2011). The jump in rural contraceptive prevalence rate has been largely attributable to the recent expansion of rural health posts, health extension workers providing family planning information, with the rapid popularity and availability of injectable methods (Assefa Yitana, 2003; John Snow Institute, 2009).

Household wealth status is found to have an important influence on women's contraceptive use. However, differential risk ratios in contraceptive use between women from the rich and poor household increased from 51.2% in 2000 to 65.3% in 2011. A study conducted by Westoff and Ochoa (1993) and Harvinder (2000) also revealed the presence of a direct relationship between wealth index and family planning.

Women's work for pay was also found to have an important influence on women's modern contraceptive use. Differential risk ratios between employed and unemployed women declined from 67.6% in 2000 to 44.1% in 2011. Previous empirical studies on the association of women's labour-force participation with fertility and contraceptive use show mixed results especially in developing countries. Some posit employment opportunities create certain viewpoints and values among women may be favourable to having smaller families and thereby to adopt contraception as a way of life (Emily, 2000; Nazar-Beutelspacher, 1999). Others argue in developing countries, where kinship networks provide unpaid child care for working women, or where child care and working for pay are incompatible, working for pay and fertility levels and contraceptive use may not be associated (Oppong, 1983). Despite the varying viewpoints this study found compelling results that may bolster the indirect role of women's labour-force participation on their contraceptive behaviour.

For each survey, the shape is approximately an inverted U-shape indicating the lowest contraceptive prevalence for the age group 15-19, but it increases gradually to reach a maximum at the age group 30-34 and 35-39, after which it decreases consistently from the age group 45-49. Differential risk ratios in contraceptive use between women age 15-19 and 45-49 slightly declined from nearly 93.3% in 2000 to 70.4% in 2011. This pattern

has been also found almost everywhere in sub-Saharan Africa (Curtis & Neitzel, 1996; Rutenberg et al., 1998; *Hailu*, 2015).

Among currently married women with at least none of children lost, the extent of contraceptive use varies much with the number of children lost. Differential risk ratios between women with none of children lost and women those who lost 4 ~~and~~ more slightly declined from 76.6% in 2000 to 74.3% in 2011. This finding conforms to the previous findings documented vicious cycle of poor child survival, low practice of fertility regulation and high fertility rate (Rutenberg et al., 1998; Shah et al., 1998; Short, 2002; United Nations, 2012).

## 5. CONCLUSIONS

The population of Ethiopia is growing in more than two million per year. Amhara is among the regions with high rate of growth and it has serious implication for the region's long-term development. Individuals and couples need to be provided with more information and services to determine freely and responsibly the number and spacing of their children consistently with their needs, economic possibilities and aspirations. The results identified important factors affecting use of contraception in the region. As a result, addressing the pervasive barriers to access and use of family planning will prove a key intervention for safeguarding the well-being of women and families in the region.

The overall trends of modern contraceptive use have been increasing since 2000 in the region, from 6.6% in 2000 to 15.7% in 2005 and 33.0% in 2011, although still relatively very low. The magnitude of the impact of residence, wealth quintiles, employment status, women's current age, and experience of child death on contraceptive had an increasing trend during 2000-2011 in the region. A close look at the prevalence of contraceptive use disaggregated by various characteristics reveals those who live in rural areas, women from poor households, unemployed women, and women who lost  $\geq 4$  children were the ones with low contraceptive use during the last decade. Contraceptive use in the region could be accelerated through increasing access to information and contraception, strengthening education and communication about the status of women, and creating employment opportunities for women particularly in rural areas. In addition, integration of family planning into maternal and child health services needs to be given high priority as this has an added effect on contraceptive use, child survival, and thereby fertility reduction.

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