



ADDIS ABABA UNIVERSITY

COLLEGE OF HEALTH SCIENCE

SCHOOL OF PUBLIC HEALTH

TREND AND INEQUALITIES IN THE CURRENT FAMILY PLANNING USE AMONG CURRENTLY MARRIED REPRODUCTIVE AGED WOMEN AND THE FAMILY PLANNING SERVICE READINESS IN ADDIS ABABA ETHIOPIA: Evidence from EDHS and PMA Ethiopia

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A RESEARCH PROPOSAL SUBMITTED TO THE GRADUATE PROGRAM OF ADDIS ABABA UNIVERSITY, COLLEGE OF HEALTH SCIENCES, SCHOOL OF PUBLIC HEALTH FOR THE PARTIAL FULFILLMENT OF THE DEGREE OF MASTERS OF PUBLIC HEALTH IN REPRODUCTIVE FAMILY AND POPULATION HEALTH SPECIALTY

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## Table of Content

Acknowledgment.....	iv
Accronyms.....	7
List of figures.....	9
List of tables .....	9
Abstract.....	10
Background:.....	10
Objective.....	10
Methods .....	10
Result .....	10
Conclusion .....	10
1. Introduction.....	11
1.1Background.....	11
1.1 statement of the problem .....	12
1.3 rationale and significance of the study .....	13
2. Litrature riview .....	15
2.1 global overview of family planning.....	15
2.2 trends of family planning.....	15
2.3 inequality in family planning use .....	16
2.3.1 inequality by wealth status.....	16
2.3.2 inequality by educational status.....	17
2.3.3 inequality by marital status.....	17
2.3.4 inequality by women’s age .....	18
2.3.6 inequality by employment status .....	18
2.3.7 inequality of family planning use among women living in urban areas.....	19
2.3.8 inequality by religion.....	19
2.3.9 inequality by parity .....	20
2.3.10 inequality by women empowerment.....	20
2.4 family planning service availability and readiness.....	21
2.5 conceptual framework .....	22
2.5 research question .....	22
3. Objectives .....	23
3.1 general objective.....	23
3.2 specific objectives.....	23
4. Methods .....	24

4.1	study setting .....	24
4.2	study design .....	24
4.3	source and study population .....	24
4.4	sample size determination.....	25
4.5	variables and data set.....	26
4.6	data processing and analysis .....	26
4.7	ethical consideration .....	28
4.8	dissemination of results.....	28
5.	Results.....	29
5.1	general characteristics of the study population.....	29
5.2	trend of family planning service .....	31
5.3	concentration index for education.....	35
5.4	decomposition analysis .....	36
5.5	family planning service readiness.....	37
6.	Discussion.....	39
	Strength and limitation of the study.....	42
7.	Conclusion .....	43
8.	Recommendation .....	44
9.	References.....	45
	Annexes .....	50

## ACCRONYMS

AU	African Union
CPR	Contraceptive prevalence Rate
CSA	Central Statistics Agency
DFPS	Demand for Family Planning Satisfied
DRC	Democratic Republic of Congo
EDHS	Ethiopian Demographic and Health Survey
FHC	Family Health Centers
FGAE	Family Guidance Association
FP	Family Planning
FMOH	Federal Ministry of Health
HSTP	Health Sector Transformation Plan
IUD	Intra Uterine Device
LAM	Lactation Amenorrhea Method
LAMC	Long Acting Modern Contraceptives
MDFP	Demand for Family Planning Satisfied With Modern Methods
MPA	Maputo Plan of Action
NGO	Non-Governmental Organization
SARA	Service Availability and Readiness Assessment
SDG	Sustainable Development Goal
SDM	Standard Days Method
SNNPR	Southern Nations, Nationalities and Peoples Region
SSA	Sub Saharan Africa
TFR	Total Fertility Rate
UNECA	United Nations Economic Commission for Africa



## LIST OF FIGURES

<b>Figure 1</b> Conceptual Framework describing factors contributing to family planning use and service inequality	22
<b>Figure 2</b> Trend of current family planning service among married women of reproductive age from EDHS 2000-2016 and PMA 2014-2021 in Addis Ababa.....	37

## LIST OF TABLES

Table 1 Summary of study population and sample size determination of EDHS and PMA survey.....	25
Table 2 summary of sample size determination of SARA 2016 and SARA 2018 in Addis Ababa .....	25
Table 3 Socio-demographic characteristics of married women in Addis Ababa from EDHS 2000-2016 and PMA 2014-2021 .....	29
Table 4 Percentage of current family planning use among married women in Addis Ababa from EDHS and PMA.....	31
Table 5 Regression based predictive probability and difference of the family planning service by different factors (EDHS).....	33
Table 6. Regression based predictive probability and difference of the family planning service by different factors(PMA).....	34
Table 7 Result of Erreygers concentration index for education by survey years of EDHS 2000-2016 and PMA 2014-2021 .....	35
Table 8. Decomposition analysis output for 2019 and 2021 PMA for all independent variables .....	37
Table 9. Family planning service readiness among health facilities in Addis Ababa.....	38
Table 10: description and measurement of dependent and independent variables used in the study .....	50
Table 11 binary logistic regression output of the trend of current family planning use across EDHS survey years and associated factors among reproductive aged married women in Addis Ababa .....	51
Table 12 Binary logistic regression output of the trend of current family planning use across PMA survey years and associated factors among reproductive aged married women in Addis Ababa .....	52

## **ABSTRACT**

**BACKGROUND:** Family planning use among reproductive aged women in Addis Ababa is declining from 56.9% to 49.9% according to Ethiopian Demographic and Health Survey (EDHS) data during 2005 and 2019. Urban health facilities had lesser availability of family planning services compared to rural facilities (87% Vs. 95%) according to Service Readiness Assessment 2016. Evidence on the trend, inequalities and service readiness in family planning services in Ethiopia is scarce and yet such evidence is important to contribute to the effort towards increasing family planning use.

**OBJECTIVE:** The objectives of this study is to assess the trend, and inequality in terms of age group, religion, parity, women empowerment, education of women and husband, employment and media exposure in family planning use among re productive aged women and health facilities that give family planning services in Addis Ababa, and, to assess the family planning service readiness of health facilities in Addis Ababa.

**METHODS:** The four Demographic and Health Surveys, the 8 Performance Monitoring for Action (PMA) was used to assess the trend and inequality among married women in Addis Ababa and Service Availability and Readiness Assessment (SARA) data set to assess the health facilities family planning service readiness. we used STATA software for the analysis. We used descriptive analysis to show socio demographic statuses and service readiness. We used logistic regression to show the trend. Concentration index was used for the ordinal equity stratifiers, regression based predictive probability and odds ratio was used for others such as age, religion, employment and parity. And finally, regression-based decomposition analysis was used to identify contribution of socio-economic and demographic factors to inequality in FP use.

**RESULT:** The overall trend of FP use is slightly increasing from 45% in 2000 (EDHS) to 60% in 2021(PMA). Primary and higher educational level of women and husband, 20-24 age group, having more than 1 child, being Christian and being employed were found to be significantly associated with high FP use. The largest contributors to education-based inequality are secondary and higher educational level of women (-0.63) in PMA 2019 and having 1 child (2.13) in PMA 2021. Among assessed health facilities, 2.1% provide 13 of the tracer items in 2016 and 1.3% provide all the 14 items in 2018.

**CONCLUSION:** Trend in FP use showed a slight increase and was not uniform among the selected equity stratifiers. Furthermore, estimates of absolute and relative inequalities show significant inequalities. FP service readiness of health facilities in Addis Ababa were low. It is recommended to maintain improvements in FP services and scaling up the interventions that directly act on leading determinants of FP inequality by targeting the disadvantaged group.

# 1. INTRODUCTION

## 1.1 BACKGROUND

Worldwide, 922 million women of reproductive age (or their partners) are contraceptive users in 2019 (1). Among 1.9 billion women of reproductive age 15-49 living in the world in 2019; 1.1 billion have a need for family planning or current users of contraception. Modern method users were 842 million and 80 million use traditional methods or have an unmet need for family planning. And, 190 million women want to avoid pregnancy and do not use any contraceptive method (2).

According to Ethiopian Demographic and Health Survey (EDHS) reports, The prevalence of contraceptive use in Addis Ababa was 56.9% in 2005 and this number declined to 49.9% in 2019 mini EDHS report (3,4).

Family planning service inequality refers to any unjust differences in the use of the service that could be resulted from differences in the socio-economic and demographic statuses such as, education, wealth, religion, and age and employment status (5–10).

Globally, there is an increasing effort to enhance FP use. United Nations adopted Sustainable Development Goal (SDG) in 2015 as a universal call to action to achieve the targets by 2030. World leaders pledged that “no one will be left behind” to ensure equal access of family planning services(11). Similarly in 2010, the African union endorsed the campaign and family planning interventions are identified as major components to be strengthened to help in the reduction of maternal and child mortality and morbidity (12). The government of Ethiopia is also committed to meet the SDG and strongly believes that family planning is one of the key strategies to improve maternal and child health and bringing about development (12). The 1993 National Health Policy which is currently under revision, sets the targets in the population policy directly or indirectly related to family planning including reducing the Total Fertility Rate (TFR) and increasing Contraceptive Prevalence Rate (CPR) (13). Similarly the Health Sector Transformation Plan (HSTP -2019/20-2024/25) has agendas about family planning including increasing CPR from 41 to 50 percent (14). The new National Adolescent and Youth Health Strategy (2021-2025) aims at reducing teenage pregnancy from 13 to 7 percent (15). The current national reproductive health strategy follows a logical approach which stepped up the implementation of the three component strategic plans: maternal and newborn health, family planning and fertility and adolescent and youth reproductive health contingent up on the implementation of HSTP (16).

Generally, those policies and strategies are playing a great role in increasing the trend of family planning use and narrowing the gap in accessibility and availability of family planning services and reducing the inequalities seen in the service areas by giving a huge emphasis on family planning. Even though those

policies and strategies are playing a great role in increasing family planning utilization, there is a gap in addressing the disadvantaged people who live in urban areas specifically.

### **1.1 STATEMENT OF THE PROBLEM**

Health inequalities are the unjust and avoidable differences in people's health across the population groups. Many barriers prevent the use of family planning and result unplanned pregnancies. (17) These barriers are multifactorial and they result inequalities in access to family planning. Those factors include both client related factors such as lack of education (5,6,9,18) and exposure to media resulting in poor knowledge about family planning methods and services, (17) low economic status (5,5,7,8,19–21) and health system factors such as poor coverage of health facilities, (22) lack of outreach services (22) and limited providers. (22) Both client and system related barriers contribute to increased inequality in the utilization of family planning services. (23) Also there are factors that create inequality in family planning services including age (5,7,9,10), residence (5–7,9), marital status (5,6,24–26), religion, ethnicity, distance to health facilities. (23)

Family planning has a significant contribution for maternal and child mortality reduction (27).. As a result of declining use of family planning and declining family planning service readiness that resulted from different inequality factors, unintended pregnancy, unsafe abortion and associated death would become high (28). A study done in South Africa shows that, Family planning can avert approximately 7000 newborn and child as well as 600 maternal deaths (28).

In our country Ethiopia, the prevalence of contraception is increasing. Contraceptive Prevalence Rate (CPR) among married women in 2005 were 14% and increased to 41% in 2019 (5). This number varies by different factors that create inequality. The first is wealth of the household, modern contraceptive use increases with increasing household wealth from 27% among women in the lowest wealth quantile to 51% among those in the highest quantile. Similarly, the percentage of women using a modern method is higher among those with a secondary education (56%) than among those with no education (32%). This in-equality also seen by residence type, the percentage of women using a modern family planning method are lowest in Somali region (3%) and highest in Addis Ababa (48%) (5).

Even though, the CPR in our country is increasing, the percentage of women of reproductive age group who were using modern contraceptive methods in urban cities is believed to be stagnated due to the different reason that create inequality of the service delivery. This is confirmed specifically in the trend of contraceptive users in Addis Ababa. The CPR decreased from 56.9% in 2005 to 49.9% in 2019 (5). When it comes to service readiness, in 2016, among all health facilities excluding health posts, 94% of them offer family planning services (29) and increased to 95% in 2018 (30). Only 7% of the health facilities have fulfilled all the tracer items for readiness and on average the mean availability of 8 tracer

items is 64% in 2016 (29). Also in 2018 only 7% of the facilities had fulfilled all tracer items for readiness which doesn't show any change from the last survey year 2016, and on average 5 tracer items out of 8 were available in assessed health facilities in the same year (63%)(30). Family planning services are declining evidenced by this trend. But there is still a lack of information in showing the relationship between family planning service readiness and family planning service inequality.

Due to the main reason that the consequences of not using contraceptive methods have a major effect on maternal and child health, this area should be further studied. And this study aims to entangle the reasons for those declines. Also, there are limited studies which focus on the trend of inequalities and service readiness of current family planning use and this shows that there is a paucity of information in this area. So, this study aims to contribute in filling this gap by showing the trend and inequalities of family planning use as well as the service readiness in Addis Ababa city.

### **1.3 RATIONALE AND SIGNIFICANCE OF THE STUDY**

One of the key goals of various health programs is to reduce maternal and child morbidity and mortality by reducing unintended pregnancies and unsafe abortion. In order to do so, multiple interventions have been implemented. Ethiopia is committed to improve the health status including family planning service by preparing different policies and strategies. Those policies and strategies aim at improving the service quality and ensure availability and accessibility. Even though, those policies and strategies put a clear pathway to improve the service, there is no enough information whether success was made in this regard. And this study has a significant contribution in evaluating those policies and strategies and also in order to furnish the information.

In spite of the increasing trend of family planning use in Ethiopia, there is still a significant variation in the prevalence of contraception use among different groups due to a bunch of reasons. Then main reasons to this inequality are educational status, age, employment status, religion, women empowerment and number of children (5). There is no study which is specifically done to assess the trends of family planning use in Addis Ababa in line with the service inequality and readiness. So, this study may have a unique finding on the study area and also, in order to address those stratifiers which create inequality of the service, there has to be enough information. And this study also aims to fill the gap of information which will have a significant advantage to address those inequalities.

The other main reason for this study is to see any changes in the use of family planning among reproductive age women in Addis Ababa by assessing the trend. And also, there is a decline in fertility rate and family planning use in Addis Ababa in recent years (5,31). The result of this study is helpful to know the main reason behind this scenario and additionally it helps policy makers and other responsible stakeholders to take appropriate measures by using this result.

After its completion, this study is expected to add on the existing knowledge regarding the trend of family planning use and the service readiness and availability in Addis Ababa. Both the strengths and limitations of this study may trigger further studies on family planning. In combination with other studies, this study is expected to consolidate evidence for policy makers and other responsible bodies who work on family planning. At the end of this study, recommendation is given to the concerned bodies to fill the gaps based on the findings of this study.

## **2. LITRATURE RIVIEW**

### **2.1 GLOBAL OVERVIEW OF FAMILY PLANNING**

Worldwide, 922 million women of reproductive age (or their partners) are contraceptive users in 2019 (1). Female sterilization is the most common contraceptive method used worldwide (1). In 2019, 23.7% of women who are currently using contraception- those 219 million women rely on female sterilization. Three other methods have more than 100 million users worldwide (male condom-189 million, IUD-159 million and the pill-151million). Overall 45.2% of contraceptive users rely on permanent methods (female and male sterilization), 46.1% on a short acting method (male condom, the pill, injectable and other modern methods) and 8.7% on traditional methods (withdrawal, rhythm and other traditional methods) (1)

### **2.2 TRENDS OF FAMILY PLANNING**

Globally, between 2000 and 2020, the number of women using modern contraceptive methods increased from 663 million to 851 million. An additional 70 million women are projected to be added by 2030 (32).

A study done in 186 world countries show that, contraceptive use among married or in union women in 2020 was above 75% in 31 countries and below 20% in 14 countries out of the 186 countries included in the study (33).

The proportion of women of reproductive age who use methods of contraception has increased in all regions since 2000, especially in regions where only a small proportion of women used contraception in the past. Significant increase in the use of contraception have occurred in Latin America and the Caribbean, central and southern Asia, Oceania (excluding Australia and New Zealand), Sub Saharan Africa and Northern Africa and Western Asia in 2020 (32).

The prevalence of contraception users in Latin America and Caribbean (excluding Australia and New Zealand) increased from 40% to 58% between 1990 and 2019, in Australia and New Zealand increased from 56% to 58%, in Oceania increased from 20% to 28%, in Northern Africa and Southern Asia increased from 26% to 34%, in Eastern Asia and Southern Asia increased from 51% to 60% between 1990 and 2019 (11).

Another study done by including SSA shows that, the prevalence of contraceptive use among married or in union women of reproductive age increased from 13% in 1990 to 33% in 2020 (33). Use of contraception among married or in union women in this region in 2020 ranged from 7% in Chad to 69% in South Sudan (33). All 10 countries with the largest increase in the use of modern contraception between 1990 and 2020 are found in SSA: Burkina Faso, Ethiopia, Kenya, Lesotho, Liberia, Madagascar,

Malawi, Mozambique, Senegal, Sierra Leone and Uganda (11) which experienced the largest decline in fertility since 2010 (33).

In Ethiopia, According to EDHS data, modern contraceptive use among currently married women has increased over the last 15 years from 14% in 2005 to 41% in 2019. The largest increase has been in the use of injectable (from 10% in 2005 to 27% in 2019) and implants (from less than 1% in 2005 to 9% in 2019). The percentage of women using a modern method is lowest in Somali (37%) and Afar (13%) and highest in Amhara (50%) and Addis Ababa (48%) (5).

The prevalence of contraceptive use is also increasing in different regions of Ethiopia between 2005 and 2019. The highest increase of contraceptive use is seen in Amhara region increased from 16.1% to 49.5%, SNNPR increased from 11.9% to 45.0% and Oromia increased from 13.6% to 40.7%. On the other hand the lowest increase is seen in Somali region which increased from 3.1% to 3.4% (5,34). This shows a huge inequality in family planning service delivery and a poor availability and accessibility.

Even though, the total contraceptive users in Ethiopia are increasing, there is a decline in Addis Ababa. Women of reproductive age who use any kind of contraceptive method decreased from 56.9% in 2005 to 49.9% in 2019. Also, the TFR in Addis Ababa is declining, dropped by 39% from 3.1 to 1.9 births per woman (31). This contradictory finding also shows that there is inequality in family planning service delivery.

## **2.3 INEQUALITY IN FAMILY PLANNING USE**

### **2.3.1 INEQUALITY BY WEALTH STATUS**

Analysis of National Family and Health Survey 4 (2015-2016) in India shows that, women in the poorest quantile lagged behind the rest , with approximately 10% points lower Demand for Family Planning Satisfied (DFPS) (7). Another study done in Pakistan shows, among urban poorest women 50.4% and among rural poorest women 68.5% of reported family planning nonuse (35).

There are notable disparities in Demand for Family Planning Satisfied with modern methods (DFPS) according to a different study conducted in 43 African countries making use of national surveys conducted since 2010 with lower coverage among the poorest women in most countries: from Eastern Africa the largest gap was found in Sudan, coverage ranged from 7% among the poorest to 52% among the wealthiest, in the Eastern and Southern Africa the largest gap was found in Angola, coverage ranged from 6% among the poorest to 46% among the wealthiest and in the West and Central Africa the largest gap was found in Central African Republic, coverage ranged from 11% among the poorest to 47% among the wealthiest (19). Similarly, another study done in Ghana and Nigeria suggested that family planning services are to the disadvantage of women in the poorest households (20).

Another study done in Western African countries on women deprivation index and family planning confirmed that, across the deprivation levels, contraceptive prevalence rates of modern method were lowest among women who were severely deprived; Nigeria (16.0%), Benin ( 16.5%), Guinea (23.9%), Mali (24.3) and Senegal (39.8%) and women with no or low deprivation had the highest CPR (21).

Another study done on adolescent girls and young women in SSA countries also confirmed a statistically significant wealth related disparities among unmarried sexually active adolescent girls and young women in Angola (47.5 percentage point), Congo (17.8 percentage point), Togo (18.7 percentage point) and Nigeria (22.0 percentage points) (8).

Also, in our country Ethiopia there is a wealth related inequality in different areas. The EDHS survey supports this, showing 27.0% of women in the lowest wealth quantile reported using contraceptives, women with middle wealth quantile 45.2% and highest wealth quantile were 53.0% in 2019 (5).

### **2.3.2 INEQUALITY BY EDUCATIONAL STATUS**

A study done in Brazil on inequality in family planning use confirmed that, contraceptive use between educated and uneducated women has a six fold difference (6).

Another study done in Pakistan shows, among women with no education who live in urban areas 44.9% of them were family planning nonusers and 57.3% of women with no education who live in rural areas were family planning nonusers (35).

Similarly another study done in 23 Latin American and Caribbean countries on long acting reversible contraceptive use shows that, the median long acting reversible contraceptive use for women with secondary education was higher (5.2%) than those with primary education (2.8%) and those with no education (2.2%) (9)

The inequality in educational status is also seen in our country as shown in EDHS report. The prevalence of contraception use among women with no education were 32.3%, women with primary education 49.0% and women with secondary education were 57.2% in 2019 (5).

### **2.3.3 INEQUALITY BY MARITAL STATUS**

A study done in Brazil on inequality of family planning also shows, women who have a partner or husband use less protection, twice less than women without a partner (6).

Another study on demand for family planning satisfied conducted in low- and middle-income countries reveals significant differences in coverage based on marital status; married women in Asia and Pacific and Latin America and the Caribbean had higher DFPS, whereas women in Central Africa and Eastern Europe and Common Wealth of Independent countries had the opposite pattern(24).

Another study done in 73 low and middle income countries on contraceptive use among adolescent girls also shows the inequality in marital status, female adolescents who were married with no children presented the lowest median modern contraceptive prevalence in all world regions, ranging from 2.9% in west and central Africa to 29.0% in Latin America and the Caribbean (25). MDFPS was below 10% among married adolescents without children in 12 countries(25). This finding is also supported by another study done in low and middle income countries to assess the reasons for non-use of contraceptive methods by women, which confirmed non-use of contraceptives was higher among married than unmarried women (26).

#### **2.3.4 INEQUALITY BY WOMEN'S AGE**

In Brazil, women aged 25-34 have high contraceptive prevalence than women aged 18-24 (6). Similarly, another study done in India using National Family and Health Survey 4 (2015-2016) shows that, older women have higher use of contraceptive, women aged 40 years and older have 3 times higher Demand for Family Planning Satisfied (DFPS) with modern methods when compared to women aged 15-19 (7).

Another study done in 23 Latin American and Caribbean countries on long acting reversible contraceptive use shows that, the median use of long acting reversible contraceptive use among adolescent girls (1.1% in women aged 15-17 years, 2.0% in women aged 18-19) was lower than among women aged 20-49 years (3.8%) (9).

Another study done in low- and middle-income countries in contraceptive use in adolescent girls and adult women shows adolescent girls were less likely to use modern methods (31.6%) than adult women (43.5%) (10). There is a growing gap in the use of modern contraceptives between adolescent girls and adult women in 18 countries, and in 20 countries, there is an unmet need for family planning (10).

The age-related inequality is also seen in our country. According to mini EDHS 2019 report, the prevalence of contraception uses among women aged between 25-29 were highest with 48.1% and lowest among women of age between 15-19 with 9.4% (5).

#### **2.3.6 INEQUALITY BY EMPLOYEMENT STATUS**

Different studies confirmed employed women have high contraceptive prevalence than unemployed women. A multilevel analysis of cross-sectional surveys of 32 SSA countries shows, women in labor or who are working were 14% more likely to have used contraceptive than those not working (36). Similarly another study done in Malawi confirmed, working women were more likely to use contraceptives than women who do not work (37).

Another cross sectional study done in Benin shows higher odds of contraceptive use among employed women than women who are not currently working (38).

### **2.3.7 INEQUALITY OF FAMILY PLANNING USE AMONG WOMEN LIVING IN URBAN AREAS**

A greater proportion of poor urban women might use contraceptive relative to poor rural women living in low- and middle-income countries and unmet need is higher among urban poor women (39). Another study done in urban Kenya shows urban rich women were about 2.4% times more likely than urban poor (40).

Another study done in urban slums in Nigeria on socioeconomic inequalities and family planning utilization shows, about 5% more female adolescents with tertiary education are using family planning compared with their completely uneducated counterparts (18).

Another study done in urban Kenya shows women with secondary education were 1.2 times more likely to use a modern method of contraceptives than their peers with primary education (40).

A USAID report show that in Ethiopia, when assessing urban rural and poverty related inequalities, wealthiest rural women lag behind the poorest of the urban (41).

### **2.3.8 INEQUALITY BY RELIGION**

Most of the studies reviewed in this paper confirmed that, contraceptive use among Muslim women were less than women with other religious belief. Among those studies, a study done in low and middle income countries show that, Muslims in Central African Republic and Guinea have low contraceptive use than other religions (26).

Similarly, a study done in rural Nepal shows that Muslims were least likely to use any modern contraceptive methods (23).

Another study done in Malawi using 2015-16 DHS surveys shows that, Muslim young women had 49% lesser odds of using contraceptive methods than Catholic women (37). Another study done in Urban slums in Nigeria shows that, being Muslim in the North was associated with about 90% lower odds of using modern contraceptives (18). Similarly, another study done in rural Malawi on the relationship of religion and FP shows that, the acceptability of modern contraceptive among Catholic leaders were remarkably high (60%). Both ever use and current use of modern contraceptive use were highest among Catholics and new Mission Protestants and lowest among Muslims (42).

A mixed-methods phenomenological study done in Western Ethiopia on socioeconomic and religious differentials in contraceptive uptake shows that, Muslims were 65% less likely to utilize modern contraceptives as compared to Orthodox Christians (43).

### **2.3.9 INEQUALITY BY PARITY**

According to a study conducted in 73 low- and middle- income countries, the lowest median prevalence of modern contraceptives among married female adolescents without children was found in West and Central Africa (2.9%), followed by Latin America and Caribbean (29%). In terms of MDFPS, married female adolescents without children had the lowest coverage in West and Central Africa (12.6%), while Latin America and the Caribbean had the highest coverage (50.4%) (25).

Another study done in low and middle income countries using DHS shows that, non-use due to health concerns was more frequently reported among women who had at least one child (26).

A population based cross sectional study done in Benin shows that, number of children ever born was significantly associated with maternal health care services including contraceptive use; women who had above 4 children were 1.48 times more likely to have contraceptive use compared to women who had 1-4 children (38).

Another study done in Urban geography in Western African countries shows that, multiparous women had about 0.58-1.47 decrease in the odds of using contraceptive methods in the pooled data (21).

According to mini EDHS 2019, women with 1-2 children were more likely to use contraceptive method (53.7%) than women with no children and more than 5 children 28.2% and 32.2% respectively (5).

### **2.3.10 INEQUALITY BY WOMEN EMPOWERMENT**

A multilevel analysis of cross-sectional surveys done in 32 SSA countries shows that various components of women empowerment were positively associated with contraceptive use after adjusting for demographic and socioeconomic factors. The study confirmed an increase in contraceptive use can be achieved by enhancing women's empowerment (including, labour force participation, disagreement with reasons to justify wife beating, decision making power, knowledge level) (36).

Another study done in Benin shows that, women with moderate decision-making power were 1.26 times as likely to have contraceptive use compared to women with low decision-making power (38).

According to a study published in the journal maternal and health in 2018, women's empowerment has a positive effect on FP use. The study was found that women's empowerment was associated with increased use of modern FP, increased awareness of contraception and increased autonomy in making FP decisions (44).

According to another study published in the international journal of health policy and management, women are empowered with improved economic and social assets; they are more likely to use FP

services. The association is even stronger when women are empowered with improved decision making autonomy in their house hold (45).

Also, a study done in Western Ethiopia on the effect of women's empowerment to FP use shows that, the women's increased decision-making power and her aversiveness towards violence were positively related to FP use (46).

#### **2.4 FAMILY PLANNING SERVICE AVAILABILITY AND READINESS**

A study done in Mongolia shows that, overall readiness score of family planning use is 34.5%. The study also confirmed family planning services were more available in Family Health Centers (FHC) (100%) than hospitals (50%) and private clinics (12.5%) (47). Another study done in Bangladesh on availability and readiness of health facilities on long acting modern contraceptives shows, of the facilities where LAMC were available, 69% of them were functional and ready to provide LAMCs to the respondents (48).

Another study done in 10 African countries (Benin, Burkina Faso, DRC, Djibouti, Mauritania, Niger, Sierra Leone, Tanzania, Togo and Uganda) on the assessment of family planning service availability and readiness based on 6 tracer items shows that, the percentage of facilities proving FP services with all the 6 tracer items ranged from 17% in Benin and Mauritania to 72% in Tanzania. The mean percentage of facilities providing FP services with all the 6 tracer items among 10 countries was 35.3% (49).

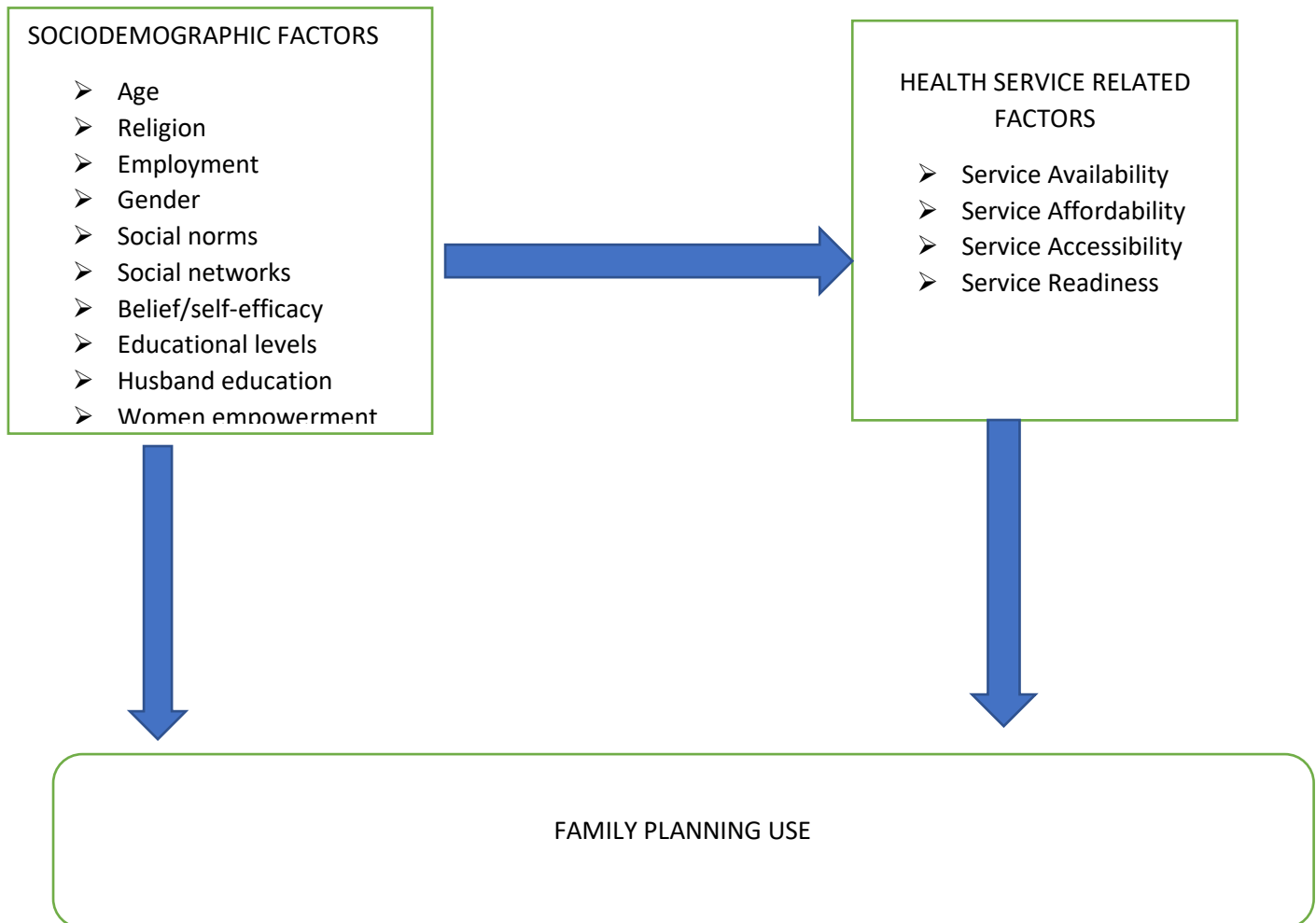
Another study in Mozambique reported the overall FP facility readiness score was 69% (50). Similarly another study done in Tanzania using service provision assessment survey 2014-2015 shows that, few (22%) facilities had a higher readiness to provide family planning services and only 42% stocked contraceptives (51).

In our country Ethiopia, there is also a large gap in promoting family planning services equally for all. According to Service Availability and Readiness Assessment (SARA) 2016 report, urban health facilities had lesser availability of family planning services as compared to rural facilities (87% and 95%). Also in Addis Ababa, percentage of facilities with all items are 10%, mean availability of trace items are 67% and the total number of facilities are 71% (29).

Generally, all the reviewed articles show the increasing trend of family planning service across all regions of the world. However, those articles also confirmed inequality of family planning services due to different factors. The factors that are confirmed to cause inequality in family planning services were educational status of women, age of women, marital status, residence and economic status. Those factors have a huge effect on FP use in different level.

## 2.5 CONCEPTUAL FRAMEWORK

The conceptual framework describes factors contributed to family planning inequality and highlights the interrelationship between the variables. This study considers current family planning use as an outcome variable and the socio-demographic (age, religion, employment, education, parity and women empowerment) and health service related factors (service availability, service readiness, service affordability and accessibility).



**Figure 1 Conceptual Framework describing factors contributing to family planning use and service inequality**

### 2.5 RESEARCH QUESTION

- ❖ What is the trend of family planning in Addis Ababa?
- ❖ What is the level of inequality in family planning use in Addis Ababa?
- ❖ What is the FP service readiness in Addis Ababa?

### **3. OBJECTIVES**

#### **3.1 GENERAL OBJECTIVE**

- To assess the trend and inequalities of current family planning use among currently married reproductive aged women and the service readiness in Addis Ababa, Ethiopia.

#### **3.2 SPECIFIC OBJECTIVES**

- To assess trend of current family planning use among currently married reproductive aged women in Addis Ababa, Ethiopia.
- To assess the inequalities of current family planning use among currently married reproductive aged women in Addis Ababa, Ethiopia.
- To assess the FP service readiness of health facilities in Addis Ababa, Ethiopia.

## **4. METHODS**

### **4.1 STUDY SETTING**

The study is conducted in Addis Ababa which is the nation's capital and home to 25% of the country's urban population(52) . It is the base of African Union (AU) and hosts the headquarters of the United Nation Economic Commission for Africa (UNECA) with larger bulk of embassies and numerous other continental and international organizations. It is the largest city in Ethiopia. Addis Ababa grew from a settlement of an estimated 15,000 people in 1888 to more than 3.6 million in 2020 (52) and 5 million in 2022 (53) and covers an area of 527 square kilometers (52).

Addis Ababa is made up of 11 sub cities. Currently there are a total of 52 hospitals of which 6 are government hospitals under Addis Ababa health bureau, 5 hospitals under FMOH, 3 hospitals under defense and police, 3 Non-Governmental Organizations (NGO) hospitals and 35 private hospitals. There are also 98 health centers and 800 different categories of clinics in the city (54).

The first family planning clinic in Ethiopia opened in 1961 in Addis Ababa at Saint Paul hospital by Family Guidance Association of Ethiopia (FGAE) and under the auspices of the Haile Selassie 1<sup>st</sup> Foundation. Since then FGAE was able to serve millions of people just during the 10 years between 1980 and 1990, over 1.3 million people were able to access services from FGAE's clinics (55).

### **4.2 STUDY DESIGN**

This study used the four EDHS datasets (2000, 2005, 2011 and 2016), PMA 2019-2022 datasets and 2016 and 2018 SARA data sets. EDHS is nationwide repeated survey and it used a cross sectional study design. PMA is a survey project designed to generate data on a variety of reproductive, maternal and newborn health indicators that can inform national and regional governments. The survey implemented cross sectional and cohort study designs (56). The cross-sectional survey of PMA is focused specifically on FP and it is repeated every year from 2019-2022 (56). SARA is a systemic survey to generate a set of core indicators of services, which can be used to measure progress in health system strengthening overtime. It used a facility based cross sectional study design (30).

### **4.3 SOURCE AND STUDY POPULATION**

Source population are all women who currently live in Addis Ababa and the study population are all reproductive aged women 15-49 years of age who lived in Addis Ababa during the study period and in terms of SARA, source population are all health facilities in Addis Ababa and study population are health facilities that give FP services in Addis Ababa.

#### 4.4 SAMPLE SIZE DETERMINATION

EDHS used enumeration areas (EA) of the 1994 census as a sampling frame for drawing the sample for 2000 and 2005 EDHS and the 2007 population and housing census conducted by Central Statistics Agency (CSA) for 2011 and 2016 survey. The sampling was a two-stage cluster sampling; each region was stratified into urban and rural areas and; Samples of enumeration areas were selected independently in each stratum with probability proportion to size allocation and EAs were the sampling unit for the first stage followed by equal probability systematic sampling to select households in these CEAs. From listed households in EA, fixed number of households (28-30) from each cluster selected by probability systematic selection. In the first part of PMA, the cross-sectional survey of all women aged 15-49 years is nationally representative household survey, focusing on FP and reproductive health behaviors and outcomes and will be repeated annually from 2019-2022. The number of EA in Addis Ababa was 22 in this survey round and comprised of 2094 women aged 15-49 years (57). Table 1 presents the summary of weighted number of the study population from EDHS and PMA survey years.

**Table 1 Summary of study population and sample size determination of EDHS and PMA survey**

Weighted number of married 15-49 women in Addis Ababa from EDHS and PMA surveys											
EDHS survey years				PMA survey years							
2000	2005	2011	2016	2014 R1	2014 R2	2015	2016	2017	2018	2019	2021
225	209	291	327	177	139	160	150	143	161	252	236

**Table 2 summary of sample size determination of SARA 2016 and SARA 2018 in Addis Ababa**

	SARA 2016	SARA 2018
<b>Total samples of Health Facilities</b>	92	77
<b>Referral Hospital</b>	12	7
<b>General Hospital</b>	33	22
<b>Primary Hospital</b>	22	3
<b>Health Center</b>	0	22
<b>Health Post</b>	7	0
<b>Higher Clinics</b>	12	15
<b>Lower Clinics</b>	6	6

#### **4.5 VARIABLES AND DATA SET**

To assess inequality selection of appropriate inequality stratifiers is important. So, those variables are widely used and proposed to study the level of inequalities and they were selected based on the review of earlier studies at global and national level. In this study the dependent variable is current use of FP and the independent variables are age, employment status, educational status, religion, parity and women empowerment.

The independent variables that will be used in this study will be categorized in to different levels and will be recoded in order to make the analysis. The educational status of the women and the husband is categorized in to 4 categories including; no education, primary education, secondary education and higher education. Age of the women is categorized into 7 standard groups and 45-49. Employment status of the women will be categorized in to 2 categories; employed and unemployed. Religious status of the women will be categorized in-to 2 categories; Christian and Muslim. Women empowerment indices: decision making power and attitude towards violence: and finally parity or number of children will be categorized in to 3; no children, 1 child and 2+ children.

To calculate current use of family planning use, the DHS and PMA statistical guide is used, the guideline recommends the calculation of current family planning use as number of women who currently use any contraceptive method divided by all women. The individual record in the DHS data files and female questionnaire in PMA across survey years are used for this purpose.

Current use of= all 15-49 aged married women who currently use any method

Family planning

All women

#### **4.6 DATA PROCESSING AND ANALYSIS**

A formal request to get EDHS and PMA datasets was submitted and data were received. The EDHS, SARA and PMA datasets are downloaded and filled in STATA software. The trend and inequalities in current family planning use are generated using datasets of EDHS 2000, 2005, 2011, 2016 and 2019 and the cross-sectional survey of PMA surveys repeated every year during 2019 and 2021. The study samples for Addis Ababa are selected in both datasets. On the other hand, statistics for the readiness in family planning service are generated using the SARA datasets collected in 2016 and 2018. The variables appropriate for this study were identified and their completeness were assessed by running frequencies to

check the missing values Most of the independent variables were recoded as a new composite variable is computed for women empowerments as they are required for further analysis. The variables appropriate for this study were identified and their completeness was assessed by running frequencies to check the missing values. The request to get EDHS and PMA datasets was submitted and received. After the dataset is received, the appropriate variables needed for this analysis is identified.

The main methods of data analysis that are used for this study include descriptive analysis, logistic regression and decomposition analysis. For purpose of this study, descriptive statistics such as running percent frequency distribution and table are used. Percent frequency distribution is a display of data that specifies the percentage of observations that exist for each data point or grouping of data points and it is used to describe the distribution of background characteristics of women in the study population. Besides cross tabulations with chi-square statistics was used to measure the magnitude of the outcome variable (contraceptive use) across categories of explanatory variables.

The chi-square is limited since it only gives the strength of the association between the dependent and explanatory responses. It does not indicate the magnitude of the association it only shows the crude magnitude other than the adjusted and also the direction of effect of the association. To establish both the magnitude and the direction of effect of the explanatory variables and the dependent variables, this study will use logistic regression. When the outcome variable is dichotomous, logistic regression is applied. Logistic regression measures the likelihood of an event taking place against the probability of an event not occurring. An important component of logistic regression is odds ratio. It is a measure of association between exposure and outcome.

Inequality in FP use was assessed through various measures of inequality. For the ordinal equity stratifiers namely maternal and paternal education status, Erreygers concentration index is used. For other exposure variables which are not inherently ordinal in nature, difference and odds ratio were used. The trend of FP use is carried out employing multiple logistic regressions, where “year” in which the surveys were done were included to directly estimate regression coefficients for the FP use over time.

Regression based decomposition analysis is used to identify relative contribution of socioeconomic and demographic factors to education based inequality in family planning use. A decomposition analysis allows us to estimate how determinants proportionally contribute to inequality in a health variable. Specifically, concentration index-based decomposition was used to disentangle the percentage contributions of various exposure variables respectively to the FP use educational disparity.

The SARA data set is analyzed with descriptive analysis by adding all the tracer items of family planning together into 14 items which used to show which health facilities provide how many of the 14 tracer

items of family planning. Among those health facilities, the least and the highest family planning service providers was identified based on the result of the analysis.

The complex nature of the data is considered during analysis by adjusting the analysis for the three design characteristics namely clustering, stratification and unequal probability of selection of observations. This would allow to produce findings that are not biased.

#### **4.7 ETHICAL CONSIDERATION**

The study used a secondary dataset from EDHS, PMA and SARA data sets. Prior to using those data sets, agreement for access of each data set were formally submitted and the required datasets are secured which allowed us to register and download the raw data. Each survey asks for the consents of respondents before the interview was conducted and they are ethically approved by the national ethics review committees. In addition to this, the specific research proposal went through the ethical clearance procedure of the School of Public Health in Addis Ababa and secured clearance from Research Ethics Committee (REC) of the school of public health, College of Health Sciences of Addis Ababa University.

#### **4.8 DISEMINATION OF RESULTS**

The thesis will be presented in an open defense at the school of public health. The final version of the thesis document will be submitted through soft and hard copy to Addis Ababa University School of Public Health. Moreover, the findings of the study will be shared with maternal health policy, programs and decision makers at federal ministry of health and Addis Ababa regional health bureau levels. Moreover, submission of manuscripts to scientific conferences like the Ethiopian Public Health Association, symposia or workshops will be considered and finally a manuscript will be published in a peer reviewed journal.

## 5. RESULTS

### 5.1 GENERAL CHARACTERISTICS OF THE STUDY POPULATION

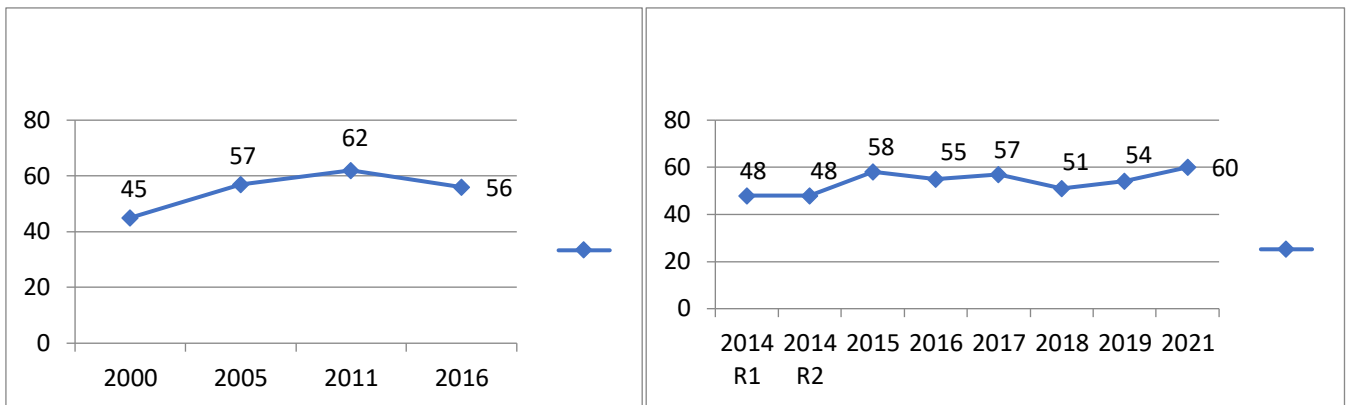
In this study, 225, 209, 291 and 327 weighted number of married women from EDHS 2000-2016 and 177, 139, 160, 150, 126, 161, 252 and 214 weighted number of married women from PMA 2014-2021 were included. Table 1 and 2 presents distribution of women by selected socio-demographic characteristics.

**Table 3 Socio-demographic characteristics of married women in Addis Ababa from EDHS 2000-2016 and PMA 2014-2021**

VARIABLES	Weighted number of married women from EDHS and PMA											
	EDHS 2000-2016				PMA 2014-2021							
	2000	2005	2011	2016	2014R1	2014R2	2015	2016	2017	2018	2019	2021
<b>PARITY</b>												
no children	23	19	36	49	30	21	18	25		27	44	10
1 child	45	50	88	85	49	43	53	47	45	42	82	77
2+ children	157	140	167	193	97	75	88	77	81	92	126	127
Total	225	209	291	327	177	139	160	150	126	161	252	214
<b>AGE</b>												
15-19	6	5	4.1	8	1	4	3	2	1	3.5	3	5
20-24	21	34	43	36	23	15	25	21	19	16	42	34
25-29	57	40	82	80	53	40	42	36	31	47	82	59
30-34	37	32	67	81	38	33	34	36	36	37	56	60
35-39	44	32	55	58	32	25	32	28	31	30	39	43
40-44	32	34	24	40	15	13	16	16	18	16	19	21
45-49	28	31	16	24	15	8	8	12	6	12	12	14
Total	225	209	291	327	177	139	160	150	143	161	252	236
<b>EDUCATION</b>												
no education	62	42	63	41	17	14	13	13	6	11	20	18
Primary	59	46	116	116	59	50	86	52	42	43	99	78
secondary& high	104	121	112	170	101	75	81	85	95	107	133	140
Total	225	209	291	327	177	139	160	150	143	161	252	236
<b>RELIGION</b>												
Christian	195	185	216	277							230	204
Muslim	30	24	75	49							22	32
Total	225	209	291	326							252	236
<b>HUSBAND EDUCA.</b>												
no education	33	25	35	22								
Primary	51	44	113	89								
Secondary& high	140	139	141	211								
don't know	1	2	3	5								
Total	225	209	291	327								

<b>EMPLOYMENT</b>				
No	133	126	154	152
Yes	92	83	138	175
Total	225	209	291	327
<b>MEDIA EXPOSURE</b>				
0	87	60	96	40
1	82	73	86	136
2	43	58	81	126
3	14	18	28	25
Total	225	209	291	327
<b>VIOLENCE</b>				
0	107	123	219	265
1	45	29	26	28
2	31	21	17	13
3	21	20	12	12
4	11	8	8	6
5	10	8	9	4
Total	225	209	291	327
<b>DECISION MAKING</b>				
0		4	4	7
1		10	16	9
2		25	42	41
3		168	229	271
Total		207	291	327

## 5.2 TREND OF FAMILY PLANNING SERVICE



**Figure 2 Descriptive Trend of current family planning service among married women of reproductive age from EDHS 2000-2016 and PMA 2014-2021 in Addis Ababa**

Trend of family planning use among married women in Addis Ababa was increasing from EDHS 2000 to 2011 (45% 95%CI; 41-49 to 62% 95% CI; 58-66 respectively) and it then decreased in 2016 (55% 95% CI; 52-59). After 2016, the trend of family planning use among married women in Addis Ababa from PMA survey years was increasing up to the year 2021 (Table 4). Generally, trend of family planning use among married women in Addis Ababa is increasing during the survey years from 2000 (45%) to 2021 (60%).

**Table 4 Descriptive Percentage of current family planning use among married women in Addis Ababa from EDHS and PMA**

YEAR	Point estimate	[95% CI]	
		LB	UB
2000	45.15966	41.17859	49.14073
2005	56.87149	52.632	61.11098
2011	62.48116	58.52155	66.44077
2016	55.94576	52.36535	59.52617
2014 R1	47.59484	42.96334	52.22634
2014 R2	48.15171	42.04138	54.26204
2015	58.29265	51.89887	64.68644
2016	54.52245	47.94945	61.09545
2017	57.33571	50.64039	64.03104
2018	51.21674	45.24248	57.19101
2019	53.59022	47.43837	59.74208
2021	60.01303	55.3836	64.64245

**LB Lower Bound; UB Upper Bound**

For the reason that Odds Ratio is difficult to interpret and less intuitive, we used margins post estimation command in order to produce regression based predictive probability to calculate trend of family planning service adjusted with the associated factors.

Predictive probabilities of the FP use varied by the background characteristics of the respondents. For example, the coverage of FP among women without formal education was about 55%, which is roughly 2 percentage points (PP) lower than among women who completed primary education.

The analysis result of EDHS data shows, increasing trend of family planning use from the survey year 2000 to 2011 but it shows a slight decrease in the year 2016 from 60% (95% CI 56.46-64.3) in 2011 to 57% (95% CI 53.76-60.41) in 2016, which is around 1.5 percentage points lower than the year 2011.

From analysis result of PMA data, the trend of current FP use among married women of reproductive age in Addis Ababa is very fluctuating. It shows a slight decrease between the first 2 PMA survey rounds of 2014 from 50% to 49.4% (95% CI 45-55% and 43-56% respectively) and this trend slightly increased between 2015 and 2016 from 57% to 58% (95% CI 52-63 and 51-64% respectively). The trend increased again in the last survey year of 2021 after a slight decrement between the years of 2017-2019. It increased from 54% in 2019 to 57% in 2021 (95% CI 48-60 and 53-61% respectively) with 7 percentage points. Generally, the trend of family planning service is increasing from the first survey year 2014 to the last 2021 (from 50% with 95% CI of 45-55 to 57% with 95% CI of 53-61).

The coverage of family planning among women aged 20-24 was about 81% (95% CI; 0.76-0.85) which is around 4 percentage points higher than other age groups.

Women who have husbands with primary education have family planning coverage of 63% (95% CI; 0.59-0.68) which is around 13 percentage points higher. Similarly, women who have 2 and more children have 69% family planning coverage (95% CI; 0.66-0.72) which is around 37 percentage points higher than women who have less than 2 children (Table 5 &6).

**Table 5 Regression based predictive probability and difference of the family planning service by different factors (EDHS)**

VARIABLES	Predictive Probability	[95% conf. interval]		DXDY(difference)	95% CI	
		LB	UB		LB	UB
<b>Education</b>						
no education	0.5497877	0.482529	0.6170465	Reference		
Primary	0.5723866	0.5316517	0.6131216	0.0225989	-0.0478192	0.093017
secondary and higher	0.6090727	0.5753419	0.6428034	0.0592849	-0.0253625	0.1439323
<b>Age</b>						
15-19	0.7709788	0.6628372	0.8791204	Reference		
20-24	<b>0.8070273</b>	0.762604	0.8514505	0.0360485	-0.0750062	0.1471031
25-29	0.7062633	0.6658612	0.7466653	0.0647155	-0.1825837	0.0531526
30-34	0.5655328	0.5164556	0.6146101	-0.205446	-0.3203164	0.0905755
35-39	0.5187557	0.4632102	0.5743012	0.2522231	-0.3679832	-0.136463
40-44	0.3364258	0.2805696	0.3922819	-0.434553	-0.5506955	0.3184106
45-49	0.2117903	0.1570281	0.2665525	0.5591885	-0.6883322	0.4300447
<b>Religion</b>						
Christian	<b>0.5883979</b>	0.564993	0.6118028	Reference		
Muslim	0.5772858	0.5204528	0.6341188	0.0111121	-0.0758941	0.536699
<b>Husband Education</b>						
no education	0.5023358	0.419439	0.5852327	Reference		
Primary	<b>0.634417</b>	0.5925102	0.6763238	0.1320812	0.2205482	
secondary and higher	0.5772634	0.5434187	0.6111081	0.0749276	-0.0197639	0.169619
don't know	0.5391776	0.3312754	0.7470798	0.0368418	-0.1851198	0.2588033
<b>WOMEN EMPLOYMENT</b>						
No	0.5714805	0.5420121	0.6009489	Reference		
Yes	<b>0.6022428</b>	0.5712957	0.63319	0.0307623	-0.013994	0.0755187
<b>Parity</b>						
no children	0.3110528	0.2607668	0.3613388	Reference		
1 child	0.5015101	0.4568529	0.5461673	0.1904573	0.1236606	0.257254
2+ children	<b>0.6906504</b>	0.6638764	0.7174244	0.3795976	0.319395	0.4398003
<b>MEDIA EXPOSURE INDEX</b>						
0	0.6010809	0.554904	0.6472578	Reference		
1	0.6035109	0.5689879	0.638034	0.00243	-0.561976	0.0610576
2	0.5634425	0.5252265	0.6016584	0.376385	-0.0979155	0.0226385
3	0.5615044	0.4829289	0.6400799	0.395765	-0.1360323	0.0568793
<b>AUTONOMY</b>						
0	0.5825126	0.3857463	0.779279	Reference		
1	0.6208802	0.5168436	0.7249169	0.0383676	-0.179371	0.2561062
2	0.5789778	0.5168637	0.641092	0.0035348	-0.2114264	0.2043567
3	0.5863438	0.563578	0.6091096	0.0038312	-0.194242	0.2019044

<b>VIOLENCE</b>						
0	0.5845852	0.5583648	0.6108056	Reference		
1	0.609531	0.539077	0.679985	0.0249458	-0.0539827	0.1038744
2	0.5429879	0.4473682	0.6386075	0.0415973	-0.1473959	0.0642012
3	0.5986078	0.5054571	0.6917585	0.0140226	-0.0840667	0.1121119
4	0.6069704	0.4565008	0.7574399	0.0223852	0.13055039	0.1752743
5	0.6134542	0.4671188	0.7597896	0.028869	0.1232486	-0.185119
<b>Survey Year</b>						
2005	0.5859594	0.5487242	0.6231946	Reference		
2011	0.6038014	0.5646459	0.6429569	0.017842	-0.0398652	0.0755491
2016	0.5708524	0.5376279	0.604077	-0.015107	-0.0636757	0.0334618

**Table 6. Regression based predictive probability and difference of the family planning service by different factors(PMA)**

<b>VARIABLES</b>	<b>PREDICTIVE PROBABILITY</b>	<b>95% CI</b>		<b>Difference</b>	<b>95% CI</b>	
		<b>LB</b>	<b>UB</b>		<b>LB</b>	<b>UB</b>
<b>Education</b>						
No education	0.500089	0.4289699	0.5712082	<b>Reference</b>		
Primary	0.5557456	0.5224734	0.5890178	0.0556566	-0.0219018	0.133215
Secondary and higher	0.5420252	0.5156344	0.568416	0.419362	-0.0337232	0.1175956
<b>AGE</b>						
under 20	0.6114783	0.422382	0.8005747	<b>Reference</b>		
20-24	0.7333428	0.6865573	0.7801282	0.1218644	-0.06679	-0.3105188
25-29	0.635495	0.6006949	0.6702952	0.0240167	-0.1669491	0.2149825
30-34	0.5580523	0.5199508	0.5961539	-0.053426	-0.2419093	0.1350573
35-39	0.4746167	0.4319196	0.5173138	0.1368616	-0.3305531	0.0568298
40-44	0.3692686	0.3153274	0.4232098	0.2422097	-0.4355767	0.0488428
45-49	0.170324	0.1154283	0.2252198	0.4411543	-0.6352722	0.2470363
<b>PARITY</b>						
No children	0.1596956	0.1200077	0.1993836	<b>Reference</b>		
1 child	0.481994	0.4451725	0.5188156	0.3222984	0.267975	0.3766217
2 and above children	0.6697729	0.6428897	0.6966561	0.5100772	0.4586869	0.5614676
<b>Survey YEARS</b>						
2014 ROUND1	0.4979068	0.4477035	0.54811	<b>Reference</b>		
2014 ROUND2	0.4944639	0.4322826	0.5566452	-0.0034429	-0.0829922	0.0761064
2015	0.5721188	0.5170423	0.6271953	0.0742121	-0.0001377	0.1485618
2016	0.5760914	0.5091601	0.6430227	0.0781847	-0.0050908	0.1614602
2017	0.5613753	0.4963877	0.6263629	0.0634685	-0.0188711	0.1458082
2018	0.5313155	0.479935	0.582696	0.0334088	-0.0387398	0.1055574
2019	0.5376265	0.4795222	0.5957309	0.0397198	-0.0367522	0.1161918
2021	0.5700565	0.525297	0.614816	0.0721497	0.0052736	0.1390259

### 5.3 CONCENTRATION INDEX FOR EDUCATION

Concentration index should be done for only ordinal type of variables. The only ordinal variable we used in our study is education. So, we have done education-based concentration index.

Across the EDHS survey years the concentration index for education shows, family planning use is more concentrated among non-educated women in survey years of 2011 and 2016 with index values of -0.0292689 and -0.0058521 and P values of 0.4993 and 0.9028 respectively. On the other hand, family planning use is more concentrated among educated women in survey years of 2000 and 2005 with index values of 0.23271606 and 0.10743305 and P values of 0.0001 and 0.0217 respectively.

Across the PMA survey years, the concentration index for education shows, family planning use is more concentrated among non-educated women in the survey years of 2014 round one and two, 2015, 2017, 2019 and 2021 with index values of -0.0821121, -0.0913545, -0.0685322, -0.023301, -0.0333829 and -0.0178537 and P values of 0.105, 0.1349, 0.4036, 0.6863, 0.5813 and 0.7587 respectively. On the other hand, family planning use is more concentrated among educated women in the survey year 2016 with index value of 0.0474037 and P value of 0.3871.

**Table 7 Result of Erreygers concentration index for education by survey years of EDHS 2000-2016 and PMA 2014-2021**

YEAR	NUMBER OF OBS.	Point estimate	STD. ERROR	P-VALUE
<b>EDHS</b>				
<b>EDHS 2000</b>	670	0.23271606	0.05284	0.0001
<b>EDHS 2005</b>	544	0.10743305	0.04526076	0.0217
<b>EDHS 2011</b>	634	-0.0292689	0.04302187	0.4993
<b>EDHS 2016</b>	677	-0.0058521	0.04769984	0.9028
<b>PMA</b>				
<b>2014 R1</b>	370	-0.0821121	0.05367128	0.105
<b>2014 R2</b>	330	-0.0913545	0.0484659	0.1349
<b>2015</b>	340	-0.0685322	0.05875792	0.4036
<b>2016</b>	348	0.0474037	0.08039832	0.3871
<b>2017</b>	329	-0.023301	0.05689576	0.6863
<b>2018</b>	377	0.04399272	0.04717514	0.3617
<b>2019</b>	386	-0.0333829	0.05960121	0.5813
<b>2021</b>	389	-0.0178537	0.05737105	0.7587

#### **5.4 DECOMPOSITION ANALYSIS**

Before this decomposition analysis, we have tried to do the decomposition analysis of EDHS survey years but the index values of all years were too small to conduct decomposition analysis. So, we conducted education-based decomposition analysis on PMA 2019 and 2021 to show the disparities of recent years.

The decomposition analysis result shows that the largest contributors to education-based inequality are secondary and higher educational level of women (-0.63) in PMA 2019 and having 1 child (2.13) in PMA 2021.

In PMA 2019, Family planning use among women with primary education, age group of 20-49 and Muslim women and; In PMA 2021, family planning use among women with secondary and higher education, age group of 35-29, 40-44, 45-49, having 1 child and Muslim women were concentrated among the educated group. This means, educated women with the listed predictors have higher FP use than un-educated women with the same group. This shows the effect of those predictor for education based inequality worked by increasing the education based inequality.

In PMA 2019, Family planning use among women with secondary and higher education, age group of 25-29, having 1 and more children and; in PMA 2021, family planning use among women with primary education, age group of 20-24, 25-29, 30-34 and having 2 and more children were concentrated among non-educated group. This means, un-educated women with the listed predictors have higher FP use than educated women with the same group. This shows the effect of those predictor for education based inequality worked by lowering the education based inequality. Table 8 represents result of decomposition analysis of percentage contribution of all independent variables to inequality in family planning use.

**Table 8. Decomposition analysis output for 2019 and 2021 PMA for all independent variables**

Variables	PMA 2019				PMA 2021			
	Elasticity	CI	Absolute contribution	% contribution	Elasticity	CI	Absolute contribution	% contribution
<b>EDUCATION</b>								
<b>No education (ref)</b>								
Primary	-0.399	-0.506	0.433	-1.30E+03	0.596	-0.54	-0.773	4327.425
Secondary&higher	-0.687	0.425	<b>-0.626</b>	1876.58	0.557	0.398	0.532	-3.00E+03
<b>AGE</b>								
<b>&lt;20 (ref)</b>								
20-24	0.129	0.102	0.028	-84.157	-0.060	0.057	-0.008	45.916
25-29	-0.200	0.022	-0.009	28.441	-0.391	0.067	-0.063	350.929
30-34	-0.324	-0.014	0.01	-28.886	-0.365	0.058	-0.051	283.683
35-39	-0.289	-0.036	0.022	-66.764	-0.423	-0.088	0.09	-501.302
40-44	-0.326	-0.063	0.044	-130.784	-0.258	-0.185	0.114	-639.646
45-49	-0.350	-0.212	0.159	-477.57	-0.290	-0.087	0.061	-341.129
<b>PARITY</b>								
<b>No children (ref)</b>								
1 child	0.803	-0.075	-0.129	385.01	10.762	0.082	<b>2.125</b>	-1.20E+04
2+ children	1.530	-0.122	-0.4	1197.921	16.715	-0.053	-2.118	1.20E+04
<b>RELIGION</b>								
<b>Christian (ref)</b>								
Muslim	-0.157	-0.05	0.017	-49.843	-0.146	-0.192	0.067	-376.636

## 5.5 FAMILY PLANNING SERVICE READINESS

Our study examines the readiness of health facilities in Addis Ababa. The family planning service readiness is assessed using 14 services including 8 tracer items (including availability of guidelines on family planning, family planning checklist and/or job aids, staff trained in family planning, blood pressure apparatus, combined progesterone contraceptive pills, injectable contraceptives and condoms) and 6 auxiliary items (combine estrogen progesterone contraceptives, progesterone only contraceptives, female condoms, implants, emergency contraceptives and IUCD).

In 2016, among 92 assessed health facilities, only 2.1% of them (2 health facilities) had 13 services ready from 14 services and 1.09% (1 health facility) had no services ready for use.

In 2018, among 77 assessed health facilities, only 1.3% (1 health facility) had all the 14 services ready and 12.99 % (10 health facilities) had only 1 service ready (table 9).

Addis Ababa regional laboratory has no family planning services ready and, Bethzatha General Hospital and Kotebe/woreda 02 HC health center has 13 family planning services ready in 2016.

In 2018, there was no health facility which is not ready for FP services. Betesayida Higher Clinic has all the 14 family planning service ready.

The most common family planning service that are available in most of the health facilities were BP apparatus. It was available in 91 health facilities in 2016 and in 77 health facilities in 2018. The least available service or item was female condom. It was available in only 2 health facilities in 2016 and 3 facilities in 2018.

**Table 9. Family planning service readiness among health facilities in Addis Ababa**

Number of services	SARA 2016		SARA 2018		Percentage Difference
	Number of facilities	Percent	Number of facilities	Percent	
No service is ready	1	1.09	0	0	-100%
1 service ready	12	13.04	10	12.99	-0.38%
2 services ready	5	5.43	2	2.6	-52.12
3 services ready	3	3.26	2	2.6	-20.25%
4 services ready	2	2.17	4	5.19	139%
5 services ready	2	2.17	3	3.9	79.7%
6 services ready	2	2.17	1	1.3	-40.1%
7 services ready	7	7.61	5	6.49	-14.71
8 services ready	7	7.61	6	7.79	2.37%
9 services ready	11	11.96	4	5.19	-56.61%
10 services ready	16	17.39	7	9.09	-47.73%
11 services ready	10	10.87	15	19.48	79.21%
12 services ready	12	13.04	14	18.18	39.42%
13 services ready	2	2.17	3	3.9	79.72%
14 services ready	0	0	1	1.3	100%
<b>Total</b>	92	100	77	100	

## 6. DISCUSSION

This study found that the current family planning use among married women in Addis Ababa is increasing during 2000 and 2021 from 45% to 60%. Having 2 or more children, primary education of husband and women age of 20-24 are found to have a significant association with higher family planning use. When we compute decomposition analysis, the largest contributors to education-based inequality are secondary and higher educational level of women in PMA 2019 and having 1 child in PMA 2021. Family planning use is more concentrated among non-educated women in EDHS survey years of 2011 and 2016 and more concentrated among educated women in EDHS survey years of 2000 and 2005. On the other hand, family planning use is more concentrated among non-educated women in all PMA survey years except 2016. The descriptive analysis of SARA shows, from the overall assessed facilities in Addis Ababa, only 2.1% of them had 13 services ready in 2016 and only 1.3% had all 14 services ready.

Our study shows different contributing factors to the inequality of family planning use. Among those educational status of the mother was one of them and this study confirmed that women with primary and higher educational level have more family planning use than women with no education. This finding is also supported by different studies across the world. Studies done in Erzurum, Nigeria, Mali and Senegal confirmed more family planning use among women with primary and higher education level than women with no education.(58–60). Studies done in our country also support this finding. Family planning use were high among educated women than non-educated women as confirmed in studies done in Oromia region and Arba Minch city and (61,62). This finding implies that supporting women to go to formal education is important to increase family planning use. Thus, it is important to make sure family planning services are available and accessible to non-educated women as well support women to go to a formal education.

Different studies show different prevalence value among different age groups. Our study also found that women aged 20-24 have more family planning use than women with other age groups. This could be due to most women in this age group want to focus on their study and carrier than bearing a child even if they are married. So they will use some kind of contraception in order to delay pregnancy until they are ready. This finding is similar with a study done in Bangladesh which shows higher contraceptive use among women aged 20-24 years(63). These finding shows young women are more interested to delay and avoid unwanted pregnancies at this age. On the other hand, studies done in Brazil and 23 Latin American countries show different finding from our study. In Brazil, women aged 25-34 have higher contraceptive use than other age groups and in the 23 Latin American countries, the study confirmed that women aged 20-49 years have high contraceptive use than other age group (9) (6). Women aged less than 38 years confirmed to have a higher odds of using contraceptives than other age groups as shown in a Nigerian study (64). A systemic review and meta-analysis done in Ethiopia shows women aged 35-49 years have 0.82 times higher use of family

planning than other age groups. (65). Thus, in order to increase family planning coverage, it is important ensure to equal family planning access to all age groups.

Most studies show that there is a high prevalence of contraceptives among women with more than 1 child. Our study also confirmed this finding. Both in PMA and EDHS surveys, women with 2 and above children are confirmed to have higher contraceptive use than women with no children and women with one child. This implies that as the number of children is increasing there will be a high need of limiting their child bearing and there will be a high contraceptive use. In recent study the TFR in Addis Ababa is 1.9 children per women (31). So, on average, women in Addis Ababa will bear 2 children then they will use a family planning method of their choice to prevent more children. This could be the main reason of high family planning use among women who have 2 and more children. This finding is also supported by a study done in Pakistan and Addis Ababa which shows higher odds of family planning use among women with more than 1 child (65, 66). Additionally, a study done in pastoralist community in Ethiopia shows higher prevalence among women with 5 and more children (68).

This study also confirmed that being Christian, employed and having educated husband have higher family planning use than Muslim, non-employed and women with uneducated husband. Studies done in Central African Republic, Guinea, Rural Nepal, Malawi and Nigeria also confirmed that Christian women have higher contraceptive use than Muslim women (23) (26) (37) (18). This could be due to religious beliefs that are related to family planning use. In our country Ethiopia, Muslim religion opposes the use of any kind of contraception. For this reason the prevalence of family planning among Muslims is very low compared to Christians. Studies done in Harar, Malawi and Senegal and Pakistan confirmed that women who had husbands with primary and higher educational level have higher odds of using family planning methods compared to women who had illiterate husbands (58,66). This finding is also supported by a systemic review and meta-analysis done in Ethiopia which shows women who had husbands with higher education have higher contraceptive use than women who had non-educated husbands (65). Those findings imply educated husbands support their partner to use family planning services and have a better understanding about the importance of family planning services than non-educated husbands. Also, the educational status of the husband will have a positive effect on the decision making process about family planning use. So, besides allowing won for formal education, it is also important to ensure access for formal education for men. Studies done in 32 SSA countries, Malawi and Benin supported our finding. Those studies confirmed that employed women have higher prevalence of contraceptive use than unemployed women (36) (37) (38). The possible reasons could be, employed women are more likely to educated and have more information about family planning so they will have high contraceptive use than unemployed women.

Most studies found a significant association between higher family planning use and electronic media exposure. But, our study found that women who had less media exposure have higher contraceptive use. This could be due to most women preferring to seek information about family planning from direct counseling in health facilities than getting it from Medias as it is a very sensitive issue. This finding is supported by a study done in Nigeria which shows respondents with electronic media exposure (radio) had lesser use of family planning (64). On the other hand studies done in Pakistan, low and middle income countries (69) and pastoralist community in Ethiopia found a different result from our study. In Pakistan, women with media exposure like TV and Radio had higher contraceptive use (66), in pastoralist community with women who have electronic media exposure have higher contraceptive use (68). Similarly, a systemic review and meta-analysis done in Ethiopia shows significant association between media exposure and increasing family planning use (65).

The association between women empowerment and family planning use is confirmed in many studies. In our study, women who had low decision-making power have slightly higher family planning use with 4 percentage points. A study done in Benin shows a different finding from our study, women with moderate decision making power had higher contraceptive use than women with lower decision making power (38). And, women who faced less violence from their partner have highest use of family planning with 3 percentage points. This implies that women who faced less or no violence from her husband might have a better access to family planning services without any opposition from her husband. This will allow her to choose and use any kind of family planning at any time. Thus, it is important to reduce violence against women in order to increase family planning use. In Pakistan, women who were able to go outside of the neighborhood with another adult had higher odds of family planning utilization (66). Similarly a study done in Western Ethiopia shows positive relationship between increased decision-making power and aversiveness towards violence and increased family planning use (46).

In 2016 Service Availability and Readiness Assessment (SARA), there were no health facility which fulfilled all 14 family planning service readiness items. Only 2.17% (2 of 92 health facilities) of the health facilities have 13 family planning service readiness items. This finding is slightly less than the readiness of family planning in Dire Dawa which is 2.44%. In 2018 SARA, 1.3% (1 of 77 health facilities) of the health facilities had all 14-family planning services ready. This finding is less than Dire Dawa which is 2.56%. This implies the family planning service readiness in Addis Ababa health facilities is less than other regional cities. This could be due to the increasing population size and limited availability of family planning commodities. In order to increase the family planning use among married women in Addis Ababa, it is important to ensure the availability and readiness of all tracer items to all health facilities which specifically give family planning services.

## **STRENGTH AND LIMITATION OF THE STUDY**

### **STRENGTHS**

- ✓ We used 2 different datasets to get more data points to see the trend.
- ✓ We have done decomposition analysis not only to identify if there is disparity or not, we used it to identify what factors contributed to this disparity.
- ✓ We reported our finding using predictive probability in order to make our finding easy to understand for the general community.

### **LIMITATIONS**

- ✓ Our finding may be biased because of the limited number of variables in PMA. Some findings reported only using variables from EDHS.
- ✓ The surveys were done using a cross sectional survey. We can't identify a cause and effect relationship for some variables. We only showed their association.

## **7. CONCLUSION**

Our study found that the overall trend of current family planning use among married women in Addis Ababa is increasing during 2000 and 2021. We found a significant association between current family planning use and primary education of husband, 20-24 age groups of women and having 2 and more children. The highest contributor to education-based inequality were found to be secondary and higher educational level of both women and her husband. This study also found low family planning service readiness in health facilities in Addis Ababa. These findings suggest that more focus should be given to disadvantaged population groups like non-educated women, non-employed women and women who have non-educated husbands. In order to do so, it is important to ensure better availability and readiness of all tracer items of family planning services through all health facilities in Addis Ababa.

## **8. RECOMMENDATION**

### **Policy Makers**

- ✓ Targeting disadvantaged population group (women above 25 years of age, Muslim women, unemployed, uneducated and women who have uneducated husband) should be given a priority.

### **RH Programmers**

- ✓ We recommend investigating the FP service delivery system and monitoring and evaluating the implementation of FP services should be given a high priority.
- ✓ We recommend further monitoring and evaluation of health facilities which give family planning services in order to make sure all health facilities give all the tracer items of FP

### **Researchers**

- ✓ We recommend researchers to further investigate on inequality of family planning services by using different methods other than ours in order to outline the problem perfectly from different point of views.
- ✓ We recommend researchers to take more caution when using both PMA and EDHS datasets together in order to answer a specific research question because of the limited existence of variables in PMA.

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## ANNEXES

**Table 10: description and measurement of dependent and independent variables used in the study**

<b>DEPENDENT VARIABLE</b>	<b>Description</b>	<b>Measurement</b>
<b>Current use of Family Planning</b>	Percentage of women who currently use any method of contraception	Are you currently doing something or using any method to delay or avoid pregnancy Coded as 1 if it is a YES and coded as 0 if it is a NO
<b>INDEPENDENT VARIABLES</b>		
<b>Education</b>	Level of education attained by the respondents	Categorized into 4 0-No education 1- primary education 2- secondary education 3- higher education
<b>Employment</b>	The work status of the woman	Categorized in to two 1-Employed 2- unemployed
<b>Age</b>	The age group of the woman	Categorized in to 7 1-15-19 2- 20-24 3- 25-29 4- 30-34 5-35-39 6- 40-44 7-45-49
<b>Religion</b>	Religious status of the respondent	Categorized in to 5 1-Orthodox 2-Muslim
<b>Women Empowerment</b>	The empowerment a women got from different sources	Categorized in to 2 indices 1.decision making power 2. attitude towards violence
<b>Parity</b>	Number of children that the woman have	Categorized in to 3 0-no children 1-1 child 2- 2+ children

**Table 11 binary logistic regression output of the trend of current family planning use across EDHS survey years and associated factors among reproductive aged married women in Addis Ababa**

VARIABLES	Odds ratio	P>t	[95% conf. interval]	
<b>PARITY</b>				
<b>No children(ref)</b>				
1 child	<b>2.448248</b>	0	1.814757	3.302877
2+ children	<b>6.192008</b>	0	4.55435	8.418536
<b>AGE</b>				
<b>&lt;20 (ref)</b>				
20-24	<b>1.608328</b>	0.107	0.9012389	2.87018
25-29	0.8872918	0.694	0.4879215	1.613552
30-34	0.4760573	0.016	0.2602067	0.8709634
35-39	0.3862804	0.002	0.2126584	0.7016537
4 0-44	0.1895171	0	0.1032825	0.3477521
45-49	0.0821403	0	0.0414541	0.1627593
<b>EDUCATION</b>				
<b>No education (ref)</b>				
Primary	1.234497	0.121	0.9457384	1.611421
secondary and higher	1.37412	0.079	0.9636803	1.959368
<b>HUSBAND EDUCATION</b>				
<b>No education (ref)</b>				
Primary	<b>1.621664</b>	0.004	1.166505	2.254422
secondary and higher	1.491753	0.033	1.032151	2.156009
don't know	1.121118	0.812	0.4342275	2.89458
<b>RELIGION</b>				
<b>Christian (ref)</b>				
Muslim	0.9972497	0.985	0.7498172	1.326333
<b>WOMEN EMPLOYMENT</b>				
<b>No (ref)</b>				
Yes	1.225465	0.034	1.015959	1.478174
<b>ME DIA EXPOSURE</b>				
<b>0 (ref)</b>				
1	0.9838135	0.89	0.7795297	1.241632
2	0.9175523	0.493	0.716757	1.174599
3	0.8749633	0.506	0.5891193	1.2995
<b>VIOLENCE</b>				
<b>0 (ref)</b>				
1	0.9858121	0.926	0.7289543	1.333177
2	0.8052944	0.274	0.5457268	1.188322
3	0.9206862	0.656	0.6386917	1.327186
4	1.063453	0.826	0.6122855	1.847068
5	0.8948355	0.706	0.5010935	1.597966
<b>SURVEY YEAR</b>				
<b>2000 (ref)</b>				

2005	1.714962	0	1.353749	2.172556
2011	1.907962	0	1.45165	2.507713
2016	1.547376	0	1.218924	1.964334
_cons	0.2368207	0	0.1253134	0.4475502

**Table 12 Binary logistic regression output of the trend of current family planning use across PMA survey years and associated factors among reproductive aged married women in Addis Ababa**

VARIABLES	Odds ratio	P>t	[95% conf. interval]	
<b>AGE</b>				
<b>&lt;20 (ref)</b>				
20-24	<b>1.944177</b>	0.164	0.7607438	4.968591
25-29	1.128377	0.801	0.4381639	2.905839
30-34	0.7728099	0.587	0.3031919	1.969826
35-39	0.5256821	0.189	0.2008351	1.375963
40-44	0.3230136	0.022	0.1231887	0.8469752
45-49	0.1046253	0	0.0378597	0.2891323
<b>Parity</b>				
<b>No children (ref)</b>				
1 child	<b>5.550086</b>	0	3.871989	7.955461
2 and above children	<b>13.24623</b>	0	8.988777	19.5202
<b>SURVEY YEAR</b>				
<b>2014 R1(ref)</b>				
2014 ROUND 2	0.9840705	0.932	0.6790484	1.426106
2015	1.420263	0.051	0.9979021	2.021389
2016	1.447779	0.068	0.9725532	2.155219
2017	1.348805	0.131	0.9136346	1.991251
2018	1.169444	0.362	0.8339642	1.639879
2019	1.20479	0.308	0.8410671	1.725806
2021	1.406217	0.034	1.02658	1.926246
<b>Education</b>				
Primary	1.300953	0.156	0.9036938	1.872846
Higher	1.218523	0.273	0.8544002	1.737824
_cons	0.1458863	0	0.0522323	0.4074646

Ref referent group.

Declaration

I, the under signed, declare that this thesis is my original work, has not been presented for a degree in this or another university and that all sources of materials used for this thesis have been fully acknowledged.

Name of student: Hewan Berhanu

Signature. -----

Date of submission: -----

This thesis work has been submitted for examination with my approval as university advisor.

Name of the primary advisor ----- signature. -----

Date: -----