



**Factors associated with adherence to Family Planning Program among  
women married in Rwanda.  
Secondary Data Analysis from RDHS 2014/2015**

**A dissertation submitted in partial fulfillment of the requirements for the degree of  
MASTER OF PUBLIC HEALTH**

**By**

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**College of Medicine and Health Sciences**

**School of Public Health**

**Supervisor: Prof MUNYANSHONGORE Cyprien**

**Year 2016**



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**November, 2016**

## DECLARATION

**I, PASCAL NTAGOMWA SEMUCYO** HEREBY DECLARE THAT THE THESIS HAS BEEN WRITTEN BY ME WITHOUT ANY EXTERNAL UNAUTHORIZED HELP, THAT IT HAS BEEN NEITHER PRESENTED TO ANY INSTITUTION FOR EVALUATION NOR PREVIOUSLY PUBLISHED IN ITS ENTIRETY OR IN PARTS. ANY PARTS, WORDS OR IDEAS, OF THE THESIS, HOWEVER LIMITED, WHICH ARE QUOTED FROM OR BASED ON OTHER SOURCES, HAVE BEEN ACKNOWLEDGED AS SUCH WITHOUT EXCEPTION.

## **ABSTRACT**

**Introduction:** High fertility rate causes rapid population growth which has many and complex effects on economic development at the household level, at the community level and national level. It has an enormous stress on the physical environment destruction. The only way to control this high fertility rate is through the use of contraceptive methods. This has to be involved not only women but also men and youth. This study aimed to identify the factors associated with adherence to the family planning Program among married women in Rwanda

**Methodology:** This was a nationally representative cross sectional study that used secondary data analysis of the Rwanda Demography and Health Survey (RDHS 2014/15).

**Results:** The results from this study revealed contraceptive prevalence rate among married women is 52.7%. We found that principal factors positively contributing adherence to family planning were education level (OR: 1.19 p value: 0.032), know how to deal with side effects (OR: 2.4, p value: 0.000), know of family planning methods in different channels (OR: 1.73, p value: 0.043). We also found that cohabitating the more time couples are cohabitating the less they use contraceptive methods, the same applies to decision making on contraceptive use, when a woman or a partner takes decision alone it reduces the contraceptive adherence with (OR:0.073 , p value0.000) and (OR: 0.53, p value: 0.000) respectively.

**Conclusion:** The contraceptive prevalence rate among married women is relatively low comparing to the national level that targets of 70% in 2016, knowledge of contraceptive methods in different ways and educational level were positively associated with contraceptive method use. Taking decision about contraceptive use alone among couples and cohabitation duration were negatively associated with contraceptive use among married women.

## **DEDICATION**

To my lovely wife **NYIRARUSALEMU Aline** and our children Ntagomwa M. Parfait, Semucyo R. Liza, Ntagomwa J. schamma, Ntagomwa A. Shane who were my strongest allies. They always kept asking me on the progress of my studies. They were and still remain a source of my dream, success and joy. They always encouraged me to achieve higher academic Excellency.

I thank you GOD to have them in my life. Finally, this dissertation is dedicated to my late parents, other family members and friends for their prayers and good wishes for me in pursuing my carrier.

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## LIST OF ACRONYMS AND ABBREVIATIONS

<b>CBHI:</b>	Community-Based Health Insurance
<b>CHW:</b>	Community Health Workers
<b>CPR:</b>	Contraceptive Prevalence
<b>CSPro:</b>	Census and Survey Program System
<b>DHS :</b>	Demographic and Health Survey
<b>EA :</b>	Enumeration Areas
<b>EICV:</b>	Enquete Integrale sur les condition de vie des Menages
<b>FP:</b>	Family Planning
<b>GoR:</b>	Government of Rwanda
<b>HF:</b>	Health Facility
<b>HH:</b>	Household
<b>HIV/AIDS:</b>	Human Immunodeficiency Virus/Acquired Immunodeficiency Syndrome
<b>IRB:</b>	Macro Institutional Board
<b>IUD:</b>	Intrauterine device
<b>KDHS:</b>	Kenya Demographic and Health Survey
<b>LAC:</b>	Latin America and Caribbean
<b>LAM:</b>	Lactation amenorrhea
<b>MMI:</b>	Military Medication Insurance
<b>MoH:</b>	Ministry of Health
<b>NISR:</b>	National Institute of Statistics of Rwanda
<b>RAMA:</b>	Rwandaise d'Assurance Maladie
<b>RDHS:</b>	Rwanda Demographic and Health Survey
<b>RNEC:</b>	Rwanda National Ethical Committee
<b>SPSS:</b>	Statistical Package for the Social Science
<b>TDHS:</b>	Tanzania Demographic and Health Survey
<b>TFR:</b>	Total fertility Rate
<b>TV:</b>	Television
<b>UDHS:</b>	Uganda Demographic and Health Survey
<b>USD:</b>	United state Dollars
<b>UN:</b>	United Nation
<b>US:</b>	United State
<b>WHO:</b>	World Health Organization

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## **INTRODUCTION**

### **I.1 Key concepts definition**

#### **Family Planning:**

**The World Health Organization (WHO)** defines Family planning as a way allowing individuals and couples to anticipate and attain their desired number of children and the spacing and timing of their births. It is achieved through use of contraceptive methods and the treatment of involuntary infertility. A woman's ability to space and limit her pregnancies has a direct impact on her health and well-being as well as on the outcome of each pregnancy(1).

We can say that family planning methods are used for three relevant elements: to plan how many children you want, when you want them and the spacing period you want. In other words the Family planning refers to a conscious effort by a couple to limit or space the number of children they have through the use of contraceptive methods(2).

#### **Contraception:**

Contraception or Birth control is a voluntary limitation or control of the number of children conceived, especially by planned use of contraceptive techniques(3).

#### **Unmet need for family planning:**

Unmet need for family planning is defined as the percentage of women of reproductive age, either married or in a union, who want to stop or delay childbearing but are not using any method of contraception(4).

#### **Adherence to family planning**

Adherence it is a process in which a person follows rules, guidelines, or standards, especially as a patient follows a prescription and recommendations for a medicine(5).

In this study we have define adherence to family planning program as married women who have used contraceptive methods at any time in the past and those who were currently using a method at the time of the survey.

## **I.2. Problem formulation**

Rapid population growth has many and complex effects on economic development. At the household level, investment per child in education and health are reduced when household has many children that are when fertility rate is high. At the community level rapid population growth puts enormous stress on the physical environment, like deforestation, as forests are cut for fire wood and new farm land and on food productivity as land-labour ratios in agriculture decline(6).

In developed countries fertility rate is lower due to the lifestyle choices associated with economic development. In Europe and North America, income per capita are more than 35.000USD by year. The contraceptive prevalence rate among women of reproductive age who are married or in a union is more than 77 percentages.

In many developing countries in Africa and Asia data form UN 2015 shows those population growth rates still growing by three percent and more annually. While income per capita per year are still less than 10,000 USD. The contraceptive prevalence rate among married women of reproductive age increased up to 63%(7).

Rwanda like many other African countries faces a rapid population growth with diminishing natural resources. This increasing population is in need of health, education, economic and other services, which requires additional resources, personnel and infrastructure to improve its welfare(8).

Rwanda is a small, landlocked, and very densely populated country in Africa. The 2012 Population and Housing Census showed an annual population growth slowing from 3.2% in 2002 to 2.6% in 2011, so it remains among the highest populated country in Africa. Over the same period, the population has increased from 8.1 million to 10.5 million while population density increased from 321 persons per square kilometre to 416 persons per square kilometre while “the population distribution of people in Africa countries is such that 32 inhabitants live in every square kilometre and on the average”(9).

Rwanda is the highest populated densely in Africa and among the highest in the world(10), comes at 24<sup>th</sup> rank among the country in world that has more people per square kilometre(11).

Rapid population growth in Rwanda is still a big challenge for the government if the population continues to grow at 2.6% with the total fertility rate of 4.2 children (DHS

2014/15) per women, the country will not be able to maintain the standard of living of their people in education, health, environment, food security and infrastructure for covering their people when economic growth is still at 8%.

Despite tremendous efforts made by the GoR in addressing the population growth rate through FP program with the CHWs who have also been commended for mobilizing the community population on the advantages of mobilizing men and women to utilize family planning services which are currently affordable and accessible to the majority of Rwandans.

The goal of the GoR is to increase the use of FP by Rwandan women of reproductive age group (15–49 years) and increase their male counterparts' involvement in FP programs. The current use of contraception among women married of reproductive age is 48% where the country's aims are to achieve a Contraceptive Prevalence Rate (CPR) of 70% by the end of 2015 and 90% by 2017(8). In Rwanda there are still many barriers of use of FP at the community level that are the resistance from certain religious groups, cultural beliefs, limited male involvement, fear of side effects, misconceptions and lack of youth friendly services as some of the most important barriers.

Even if Rwanda has made remarkable progress in controlling the population growth, the current population requires a careful focus on the population to change their fertility behavior through a change in preference to reduced family size, increasing education and employment opportunities, and continued access to family planning service. The current contraceptive prevalence rate of 48% is still low compared to the expected CPR of 70%. Men are requested to be more involved in the FP program. In addition the knowledge on FP program is still low in the entire community.

### **Research question of the study**

Considering the above situation, what are the factors associated with the low CPR in Rwanda? To which extent men are involved in the FP program?

What is the level of awareness of Rwandan population on the FP methods?

### **I.3.Study justification**

Rwanda has a remarkable increase in contraceptive use during the last ten years. While it was one of the lowest contraceptive use countries in DHS 2005, ten years after it has

become one with the highest contraceptive prevalence rate (CPR) in Sub-Saharan Africa. Between 2005 and 2015, the CPR has risen from 17 % to 48%. Unmet need for FP dropped by half being 19% and the total fertility rate (TFR) from 6.1 to 4.2 births per woman(12)

The Contraceptive Prevalence rate remains low compared to the expected of CPR of 70%. This study will document the reasons of such slowness.

## **I.4. LITERATURE REVIEW**

### **Developed countries**

The more developed countries in Europe and North America, as well as Japan, Australia, and New Zealand, are growing by less than 1 percent annually. Population growth rates are negative in many European countries, including Russia (-0.5%), Estonia (-0.4%), Hungary (-0.3%), and Ukraine (-0.8%). If the growth rates in these countries continue to fall below zero, population size would slowly decline(13).

The developed countries have good literacy rate, infrastructure facilities and educational system. All developed nations in the world have high literacy rate. Literacy is the key which makes countries advanced and civilized. In other words, development of a country directly depends upon its literacy rate. This term also includes skills to access knowledge through technology. A top 10 developed countries having 99.8% and above have been considered as the countries having 100% literacy rate and are Norway, Canada, Germany, Switzerland, Denmark, USA, New Zealand, Netherland and Australia(14).

In advanced countries the health care system is advanced with medical technologies in which government doing as the principal payer of medical and provides health insurance to all their citizens. Some countries like United States, Canada, France and Britain their government share of health care spending, 47.7% of US, 70.6% for Canada, 77.9% for France and 84.1% for Britain(15).

In developed countries where there are a lower fertility rate due to lifestyle choices are associated with economic affluence where mortality rates are low, birth control is easily accessible and children often can become an economic drain caused by housing, education cost and other cost involved in bringing up children. Higher education and professional careers often mean that women have children late in life(16). In a developed country the cost of children rises and their benefits to parents decline, leading parents to want fewer children.

While the contraceptive prevalence among women of reproductive age who are married or in a union in developed country are more than 77 percentage Norway reach to 88 per cent of contraceptive use.

In developed country the resources are balanced on their population where in which are low rate of population growth, high standard of living, high child welfare, health care, good medical, transportation, communication and educational facilities, better housing and living conditions, industrial, infrastructural and technological advancement, higher per capita income, increase in life expectancy etc..(17).

### **Developing countries**

In most of the developing countries in Africa and Asia the data form UN 2015 shows those population growth rates are still growing by three percent and more annually.

In developing countries, life expectancy is under 50 years, compared to 77 in richer countries. Lack of clean water, sanitation and hygienic living conditions cause about two million deaths every year - most of them among children. About 820 million people do not receive enough food to lead healthy and productive lives, while 160 million children are seriously underweight for their age(18).

Developing countries face multiple health challenges. Besides the diseases common to all countries, such as diabetes and cancer, they face an additional disease burden related to their geography and poverty, including tropical diseases, such as malaria, dengue fever, and schistosomiasis; waterborne diseases, due to unclean drinking water; respiratory diseases, due to indoor air pollution from cooking and heating with solid fuels; and, HIV/AIDS, which has been most prevalent in Africa, where it is thought to have originated(19). In low-income countries are still existing the various dimensions of barriers to access to health care (geographical access, availability, affordability and acceptability)(20). In many countries, the lack of trained and skilled healthcare professionals to operate and maintain equipment is still a challenge(21).

The Universal Declaration of Human Rights makes clear that every child has the right to a free basic education, so that poverty and lack of money should not be a barrier to schooling. In many developing countries, over the last decades governments have announced the abolition of school fees and as a result, seen impressive increases in the number of children going to school. Families remain locked in a cycle of poverty that goes on for generations. In many countries in Africa, while education is theoretically free, in practice 'informal fees' see parents forced to pay for 'compulsory items' like uniforms, books, pens, extra lessons, exam fees or funds to support the school buildings. But for many of the poorest families, school remains too expensive and children are forced to stay at home doing chores or work themselves. In some areas, the nonexistence public schools means that parents have no choice but to send their children to private schools that, even when technically 'low fee', are unaffordable for the poorest families who risk making themselves destitute in their efforts to get their children better lives through education(22).

In developing countries, 200 million people aged 15 to 24 have not even completed primary school and need alternative pathways to acquire basic skills for employment and prosperity(23).

Between 1999 and 2009, an extra 52 million children enrolled in primary school, resulting in the net enrolment ratio in primary education<sup>1</sup> reaching 89 percent in developing countries (UN, 2011). Sub-Saharan Africa showed the greatest improvement, increasing from 12 to 76 percent in 2009, and most regions around the world have recorded improving enrolment ratios(24). There has been substantial progress in these goals. 87 percent of children in developing countries finish primary education.

The developing country people do not enjoy healthy and safe environment to live, high illiteracy rate, poor educational, transportation, communication and medical facilities, unsustainable government debt, unequal distribution of income, high death rate and birth rate, malnutrition both to mother and infant which case high infant mortality rate, poor living conditions, high level of unemployment and poverty(17).

A dramatic decline in fertility and increase in contraceptive use in the Latin America and Caribbean (LAC) region, the current contraceptive prevalence rate (all methods) of 74 percent it is among the highest of any region in the developing world. Many factors have contributed to the dramatic decline in fertility in the LAC region, including the increased educational levels, improved economic conditions, decreased infant and child mortality, rapid urbanization, political stability, and changing cultural norms, among others(25).

## **Rwanda**

Rwanda's high population growth is not only one of the major causes of the depletion of natural resources; it is also the major cause of poverty and hunger and a handicap to development. In a country already overpopulated, the continued rapid population growth becomes a big challenge for the socio-economic development. The number of people in need of health, education, economic, and other services is large and increasing, which, in turn, means that the amount of resources, personnel, and infrastructure required is also increasing depleting the limited resources of the country, reducing investments and hampering efforts for the development(26).

Rwanda's population increased by about 2.4 million; Population growth has slowed down (to 2.6% in 2012 from 3% in the 2002 census) but remains high, especially in light of Rwanda being one of most densely populated countries in Africa (at 415 people per km<sup>2</sup> in 2012). Over the last decade, the life expectancy of Rwandans has increased significantly from under 50 in 2000 to 64.5 by 2012(27).

In Rwanda the accessibility and availability of health are still in developing where the average time required to access the nearest health centre on foot are from four minutes to 61 minutes and Health insurance coverage has remained stable at the national level 70% in EICV4(28).

Health care it is still issues in Rwanda reflect or are explained by a number of factors that are: the demographics, socioeconomic conditions, mainly high poverty, illiteracy and social vulnerability levels.

Health insurance in Rwanda is made up of the compulsory contribution scheme La Rwandaise d'Assurance Maladie (RAMA), which is mainly for public sector workers, the

Military Medication Insurance (MMI), which covers personnel in military personnel, and community-based health insurance (CBHI), commonly referred to as *mutuelles de santé*, which covers the rest of the population, and other private schemes. The main sources of funds for the CBHI are premium contributions (by the population), which accounts for 55% of all CBHI revenues, the Government (mainly to cover vulnerable groups and other special categories of citizens) accounting for 21% and donors (Global fund), which provide 11% of CBHI revenues(29).

In 2012, the government of Rwanda have started to expanded to 12 years, while schooling is fee-free, there is an expectation that parents should contribute to the cost of their children's education by providing them with materials, supporting teacher development and making a contribution to school construction.

According to the government, these costs should not be a basis for the exclusion of children from education(14).

In 2013, the gross enrolment ratio for tertiary education in Rwanda was 7.9%, from 3.6% in the country's literacy rate, defined as those aged 15 or over who can read and write, one in three people (32%) are illiterate(30)

The FP program headed by the government commitment and the support of development partners has done exceptionally well. In just ten years, the modern contraceptive prevalence rate (CPR) more than quadrupled from 10% in 2005 (Rwanda Demographic and Health Survey (RDHS) to 48% in 2014 (DHS 2014-15). The total fertility rate decreased from 6.1 per woman in her lifetime in 2005 (RDHS 2005) to 4.2 children per woman in 2014 (RDHS 2014), underscoring the important role of FP in addressing population growth(31).

Rwanda's vision for FP is one in which "all Rwandans contribute to the health and prosperity of their country by being well informed about the broad choice of family planning options, managing their own fertility choices and having equitable access to the services they chose close to where they live."

The goal of Rwanda is to increase the use of FP by Rwandan women of reproductive age group (15–49 years) and increase their male counterparts' involvement in FP programs. The general objective is to increase modern contraceptive use among women in union to

70% by 2016, through a programmatic framework supporting sustainable service quality, normative demand and an enabling environment(8).

Despite tremendous effort made by the GoR in addressing the population growth rate through FP program, the way is still long for to reach the purpose of 70% of modern contraceptive use among women in union(8).

The knowledge, acceptability and use of the full range of FP methods and services in the entire community are still low. Where the myths and misconceptions about FP continue to be a challenge to FP in many countries and Rwanda is no exception. The mistaken belief that FP methods cause cancer or infertility, misconceptions about return to fertility after contraceptive use or pregnancy risk(32)

Knowledge therefore remains a critical principle and is fundamental for those seeking FP services. Correct knowledge about FP facilitates informed decisions to utilize available services and to dispel incorrect beliefs in the community. The acceptance of youth use of contraception by the community members, frequentation of FP services by women and their male counterparts are still low(32).

## **I.5. Study objectives**

### **Overall objective**

This study will identify the factors associated with adherence to the family planning Program among married women in Rwanda.

### **Specific objectives**

- To measure the level of knowledge and attitude of married women towards family planning methods.
- To identify different sources of information about FP program, availability of different contraceptive methods and accessibility of family planning service to the beneficiary population.
- To raise the involvement of men in the FP Program.
- To calculate adherence to family planning
- To identify factors associated with adherence to FP Program.

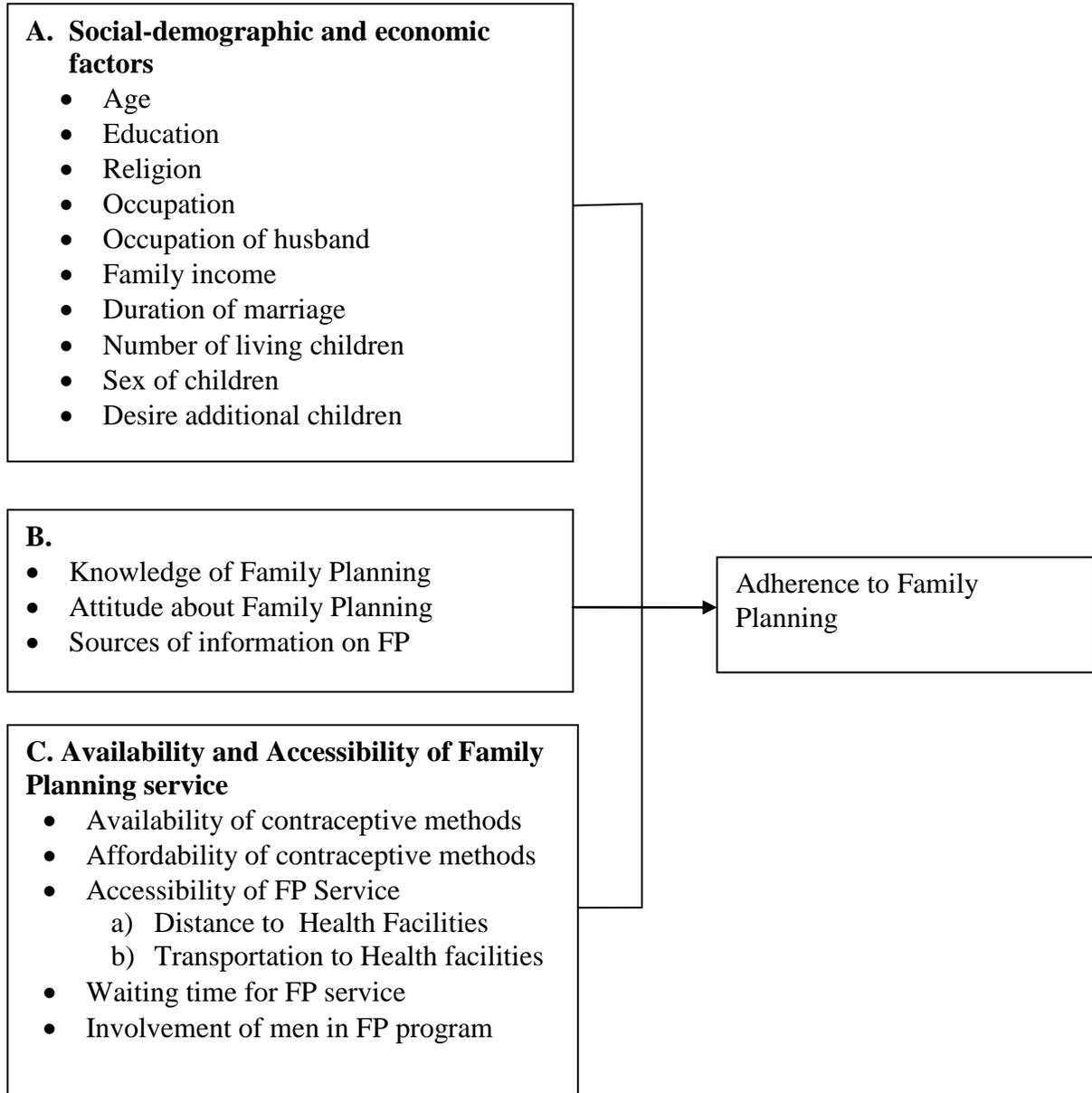
## **Conceptual framework**

This framework as shown in figure 1 constitutes the different section of this study that will be used in the field to help us in analysis process.

- Socio-demographic characteristics that are age, level of education, occupation, family income, duration of marriage, number of living children, sex of children and desire of additional children will help us to know the status of our respondents;
- The knowledge of different interests to the use of FP methods
- Attitude towards adherence to FP program
- Sources of information on FP program
- Availability of contraceptive methods
- Affordability of contraceptive methods
- Accessibility of FP service:
  - a) Distance to Health facilities
  - b) Transportation to Health facilities
- Waiting time for FP service
- Involvement of men in family planning Program

**Figure 1: Illustration of conceptual framework of independents variables and dependent variable**

**Independent Variables    Dependent Variable**



## **II. METHODS**

### **II.1. Study area description**

The country of Rwanda is situated in central Africa, immediately south of the equator between latitude 1°4' and 2°51' S and longitude 28°63' and 30°54' E. It has a surface area of 26,338 square kilometers and is bordered with Uganda on the north, Tanzania on the east, the Democratic Republic of Congo on the west, and Burundi on the south. Landlocked, Rwanda lies 1,200 kilometers from the Indian Ocean and 2,000 kilometers from the Atlantic Ocean.

Rwanda forms part of the highlands of eastern and central Africa, with mountainous relief and an average elevation of 1,700 meters. However, there are three distinct geographical regions.

Western and north-central Rwanda is made up of the mountains and foothills of the Congo-Nile Divide, the Virunga volcano range, and the northern highlands. This region is characterized by rugged mountains intercut by steep valleys, with elevations generally exceeding 2,000 meters. The Divide itself rises to 3,000 meters at its highest point but is dwarfed by the volcano range, where the highest peak, Mount Karisimbi, reaches 4,507 meters. The Congo-Nile Divide slopes westward to Lake Kivu, which lies 1,460 meters above sea level in the Rift Valley trough.

In Rwanda's center, mountainous terrain gives way to the rolling hills that give the country its nickname, "Land of a Thousand Hills." Here the average elevation varies between 1,500-2,000 meters. The area is also referred to as the central plateau.

Further east lies a vast region known as the "eastern plateaus," where the hills level gradually into flat lowlands interspersed with a few hills and lake-filled valleys. The elevation of this region generally is below 1,500 meters.

Rwanda has a dense network of rivers and streams, which drain into the Congo River on the western slope of the Congo-Nile Divide, and into the Nile River in the rest of the country via the Akagera River, which receives all the streams of this watershed. Water resources also include several lakes surrounded by wetlands.

Rwanda is divided into 4 geographically-based provinces Northern, Southern, Eastern, and Western and the City of Kigali, with the provinces being further subdivided into 30 districts, 416 sectors, 2,148 cells, and 14,837 villages (Imidugudu).

## **II.2. Study design**

The current study is nationally representative cross section study used secondary data analysis of the Rwanda Demography and Health Survey (**RDHS 2014/15**).

## **II.3. Specific objectives achievement**

### **II.3.1. Achievement of specific objectives**

- To measure the level of knowledge and attitude of married women towards FP methods, we considered the proportion of the respondents knowing more than one modern contraceptive method and favorable to use of contraceptive methods.
- To identify different sources of information about FP program, availability of different contraceptive methods and accessibility of FP service to the beneficiary population, we considered different sources presented by respondents like radio, television, newspapers, health facilities agent and Community Health Workers.
- Availability of contraceptive methods was specified as well as the accessibility of FP service.
- To raise the involvement of men in the FP Program, we considered the proportion of women who discussed the problem of FP program with their spouse or partner, who were encouraged by them to use FP methods, who attended the Health Education session on the FP program in the Village, Health centers; women whose spouse or partner provided advice on FP methods to their counterparts.
- To calculate adherence to family planning program.
- To identify factors associated with adherence to FP Program, bivariate and multivariate analysis were performed considering dependent variable and independent variables mentioned in figure 1.

### **II.3.2. Study variables**

#### **Main outcome variable**

The outcome variable of this study is adherence of family planning program. RDHS 2014/15 asked the various ways or methods that a couple can use to delay or avoid a pregnancy.

#### **Explanatory variables**

##### **a) Social – demographic and economic factors**

**Age:** age of respondent was categorized by group interval.

**Education level:** Education level of the respondents was categorized in three subcategories: primary, secondary and higher school.

**Religion:** religion of respondent was categorized in three subcategories: Christian, Muslim and others.

**Occupation of respondent:** occupation of respondent at the time of survey was categorized in three subcategories: not working, agriculture and other.

**Husband/partner's occupation:** was categorized in three subcategories: not working, agriculture and others.

**Wealth index of household:** wealth index of household was categorized by: poor, middle and rich.

**Cohabitation duration:** this variable was categorized by number of cohabitation years

**Desire additional children:** desire additional children was categorized by: Both want same, Husband wanted more, Husband want fewer and don't know.

##### **b) Knowledge and attitude about family planning**

Knowledge of contraceptive methods is composed by following key variables:

- the respondent should name the ways that a couple can use to delay or avoid a pregnancy or birth.
- The respondent should know using a suitable contraceptive method in a timely and effective manner.

- Attitude towards family planning and child spacing;
- Patterns of communication about family planning between spouses;
- Availability of contraceptive methods.
- Affordability of contraceptive methods.
- Accessibility of family planning service:
  - ✓ Distance to health facilities
  - ✓ Transportation to health facilities.
- Contraceptive methods use, reason for non-use, intention for future use of contraceptives
- Involvement of men in family planning program.

### **II.3.3. Analysis plan**

After registration to DHS program website and getting authorization and to use DHS data set, RDHS 2014/15 dataset have been provided to us to allow its secondary analysis. We selected our target population which is married women in reproductive age 15-49 who completed individual questionnaire in RDHS 2014/15. This analysis will look for the factors associated with the adherence of family planning program.

To identify the factors associated with the adherence to family planning program among married women in Rwanda, the study used bivariate and multivariate analysis with statistical tests with SPSS.

### **II.4. Study population**

All women age 15-49 who were either permanent residents of the household or visitors present in the household on the night before the survey were eligible to be interviewed. In addition, in a subsample of half of all households selected for the survey, all men age 15-59 were eligible to be interviewed if they were either permanent residents or visitors present in the household on the night before the survey(33).

### II.4.1. Sample size calculation

The sample of 2014/15 RDHS is a two-stage stratified cluster sample, sampling weights was calculated based on separate sampling probabilities for each sampling stage and for each cluster. We used the following notations:

***P1<sub>hi</sub>***: first-stage sampling probability of the *i<sup>th</sup>* village in stratum *h*

***P2<sub>hi</sub>***: second -stage sampling probability within the *i<sup>th</sup>* village (household selection)

Let *a<sub>h</sub>* be the number of villages selected in stratum *h*, *M<sub>hi</sub>* be the total population according to the sampling frame in the *i<sup>th</sup>* village, and *M<sub>hi</sub>* be the total population in the stratum *h*. The probability of selecting the *i<sup>th</sup>* village in the 2010 RDHS sample is calculated as follows:

$$\frac{a_h M_{hi}}{\sum M_{hi}}$$

Let *b<sub>hi</sub>* be the proportion of households in the selected segment compared with the total number of households in the village *i* in stratum *h* if the village is segmented; otherwise *b<sub>hi</sub>* = 1. Then the probability of selecting village *i* in the sample is:

$$P1_{hi} = \frac{a_h M_{hi}}{\sum M_{hi}} \times b_{hi}$$

A 2014/15 RDHS cluster is either a village or a segment of a large village. Let *L<sub>hi</sub>* be the number of HH listed in the HH listing operation in the cluster *i* in stratum *h*, let *g<sub>hi</sub>* be the number of households selected in the cluster. The second stage's selection probability for each household in the cluster is calculated as follows:

$$P2_{hi} = \frac{g_{hi}}{L_{hi}}$$

The overall selection probability of each HH in cluster *i* of stratum *h* is therefore the production of the two stages of selection probabilities:

$$P_{hi} = P1_{hi} \times P2_{hi} \quad (33)$$

Thus the total number of the study population were altogether, 13,497 women age 15-49 and 6,68 men age 15-59 were interviewed(33).

#### **II.4.2. Sampling technics and data collection**

The sample for RDHS 2014 was a stratified sample selected in two stages from the 2012 census frame. Stratification was achieved by separating each district into urban and rural areas, each of which formed a sampling stratum. In total, 60 sampling strata were created. Samples were selected independently in each sampling stratum, by a two-stage selection. In the first stage, 492 EAs were selected with probability proportional to the EA size and with independent selection in each sampling stratum with the sample allocation.

A HH listing operation was carried out in all of the selected EAs before the main survey. The household listing operation consisted of visiting each of the 492 selected EAs to draw a location map and a detailed sketch map, and to record on the household listing forms all residential households found in the EA with the address and the name of the head of the households. The resulting list of households served as the sampling frame for the selection of households in the second stage which took place in the central office.

At the second stage, a fixed number of 26 households were selected from each selected EA. Among the 492 EAs, 113 were from urban areas and 379 were from rural areas. The total number of households selected was 12,792, 2,938 of which were from urban areas, and 9854 of which were from rural areas(33).

The 2014-15 Rwanda Demographic and Health Survey (RDHS) it is a nationally representative sample of 12,800 households was selected. All women age 15-49 who were usual residents of the selected households or who slept in the households the night before the survey were eligible for the survey. A survey of men was also conducted in a subsample consisting of every second household. All men age 15-59 who were usual residents or who slept in the subsampled households the night before the surveys were eligible to be interviewed.

#### **II.4.3. Criteria of the study**

This study will be composed by subpopulation of women married and living with partner aged 15-49, who complete individual questionnaire. Considering the above criteria, the total numbers of married women and living with partner women interviewed in DHS 2014/15 are 6,880 were eligible to be including in our study.

## **II. 5. Study tools**

Three questionnaires were used for the 2014-15 RDHS: the Household Questionnaire, the Woman's Questionnaire, and the Man's Questionnaire. These questionnaires were based on the DHS Program's standard Demographic and Health Survey questionnaires. They were adapted to reflect the population and health issues relevant to Rwanda.

Data were entered using CSPro, a program developed jointly by the United States Census Bureau, the ORC Macro MEASURE DHS+ program, and Serpro S.A. Processing the data concurrently with data collection allowed for regular monitoring of teams' performance and data quality. After that the data was analyzed through various statistical tools such as Statistical Package for the Social Science (SPSS).

### **Statistical tests**

In descriptive analysis, a distribution of samples were presented as proportion by the categories of each independent variable we defined our potential covariate for women in reproductive age and test them with Pearson chi-square in order to test their association with factors associated to the adherence of FP program. Chi-square probability of 0.05 or less indicates that the independent variable is related to the dependent variables. In bivariate analysis we defined some of independent variables that were associated with dependent variables: socio demographic characteristics and sources of information on FP program. In multivariate all covariate were tested with logistic regression for the full model.

The analysis was carried out in SPSS version 21 we used a syntax command to apply probability weight, account for clustering and stratification in the sample design, and apply subpopulation analysis technics. The main research question were answered by using multivariate analysis, with chi-square test will be used for identify independent predictors a multiple logistic regression model.

## **II. 6. Utilization of findings**

For the purpose of this study is to generate evidence on factors associated with adherence to FP program that will guide improvements in policies and practices. Inform decisions makers on specific interventions that will leads to better policy outcomes. The

information from this study will also be used by student in their research in the future and provide benchmark information for measuring FP program achievement at programs objectives and intermediate results level as well as identifying benchmarks and indicators which can be used as points of reference for monitoring and evaluation of program.

## **II.7. Ethical considerations**

Ethical consideration is well addressed in RDHS 2014/15 survey for National Institute of Statistics of Rwanda in collaboration with MoH. The protocol including FP was approved by National Ethics Committee of Rwanda (RNEC) and the ORC Macro Institutional Board (IRB) in Calverton, Maryland USA. In RDHS 2014/15, a general health interview was conducted before collected the data on FP. The selected respondents were required to provide written informed consent before interview. A written statement describing the benefits and potential risk was also read to the participants.

The interview was required to record on the questionnaire the respondent's decision and to further endorse that the decision was indeed as given by the respondents.

### III. Results

#### 3.1 Socio demographic characteristics of respondents

Table 1 show that the highest percentage 42.5 percent was observed in the age group of 30-39 years. Among married women those who completed the primary education level are 69.5 percent. The majority of the study populations were Christians 96.4 percent. Concerning the women married occupation the majority of them are employed in agriculture 73.7 percent and for wealth index of household of women married, the majority of them are richer, 41 percent.

**Table 1: Socio demographic and economic characteristics among women married Rwanda DHS 2015**

<b>Age (in Years)</b>	<b>N</b>	<b>%</b>
>=19	81	1.2
20-29	2403	34.9
30-39	2924	42.5
40+	1472	21.4
<b>Education level</b>		
No education	1098	16.0
Primary	4785	69.5
Secondary	765	11.1
Higher	232	3.4
<b>Religious status</b>		
Christian	6631	96.4
Muslim	156	2.3
No religion and Other	93	1.4
<b>Husband/partner's occupation</b>		
Did not work	75	1.1
Agriculture	4181	60.8
Other work	2624	38.1
<b>Respondent's occupation</b>		
Not working	417	6.1
Agriculture	5073	73.7
Other work	1390	20.2
<b>Wealth index</b>		
Poorer	2685	39.0
Middle	1367	19.9
Richer	2828	41.1

<b>Cohabitation duration</b>		
0-4	1685	24.5
5-9	1625	23.6
10-19	2324	33.8
20+	1246	18.1
<b>Ideal number of children</b>		
0 child	10	.1
1-2 children	1253	18.2
3-4 children	4418	64.2
5+ children	1199	17.4

### 3.2. Knowledge and attitude of married women towards FP methods

Table 2 shows that the knowledge of contraceptive methods is universal (100 percent), the knowledge of each method is highest among currently married women, pill, injection and condom are known more than 99 percent, IUD, implant/Norplant and periodic abstinence are known more than 95 percent, female sterilization, male sterilization, withdrawal, lactation amenorrhea (LAM) and female condom are known more than 85 percent.

Majority of respondents know the side effects of family planning 63, 4 percent and most of respondents know how to deal with side effects of family planning from health facilities 96,8 percent.

**Table 2: Proportion of married women’s knowledge and attitude of Family Planning methods**

<b>Knowledge of any method</b>	<b>(%)Yes</b>	<b>(%)No</b>
Knows no method		2 (0)
Knows modern method	100 (6878)	100
<b>Knowledge of contraceptive methods</b>		
Pill	99.4 (6842)	0.5 (35)
IUD	90.6 (6235)	9.4 (644)
Injections	99.6 (6855)	0.4 (25)
Condom	99.2 (6823)	0.8 (55)
Female sterilization	86.3 (5930)	13.7 (950)
Male sterilization	86.3 (5936)	13.7 (943)

Periodic abstinence	95.1 (6543)	4.9 (335)
Withdrawal	88.8 (6109)	11.2 (770)
Implants/Norplant	98.6 (6785)	1.4 (94)
Lactation amenorrhea (LAM)	89.3 (6143)	10.7 (736)
Female condom	87.4 (6015)	12.6 (865)
Emergency contraception	36.8 (2531)	0
Standard Days Method	92 (6333)	7.9 (546)
Told about side effects	63.4 (1691)	36.6 (975)
Told how to deal with side effects	96.8 (1795)	3.2 (60)

### 3.3. Sources of information about FP program among married women

Most of the respondents among married women got their information from Health facilities with 71percent, 55.5 percent from radio and 28, 4 percent received information on FP by family planning worker in their community, as show in table3.

**Table 3: Source of information about FP program among married women**

Source of information on FP service	(%)Yes	(%)No
Heard family planning on radio last few months	55.3 (3802)	44.7 (3077)
Heard family planning on TV last few months	8.1 (556)	91.9 (6321)
Heard family planning in newspaper/magazine last few months	6.7 (458)	93.3 (6419)
Visited by family planning worker last 12 months	28.4 (1952)	71.6 (4928)
Visited health facility last 12 months	71.1 (4933)	28.3 (1947)
At health facility, told about family planning	64 (2270)	54 (2663)

### 3.4. Availability and accessibility of Family Planning service

Table 4 shows that about 55 percent of contraceptive users reported to prefer accessing their contraceptive methods from Health center and community health workers for 25 percent. Almost sixty percent reported getting their service from government clinic/pharmacy and Government home or community delivery for 32.7 percent.

Getting money for treatment for respondents is not a big problem 52 percent. Distance to health facilities for most of the respondents is not a big problem for 78 percent.

**Table 4: Availability and Accessibility of Family Planning service**

<b>Last source for current users</b>	<b>N</b>	<b>%</b>
Referral /Provincial/District hospital	150	4.7
Health Center	1732	55.1
Health post	141	4.5
Community outreach	96	3.1
Community Health Worker	786	25.0
Youth Center	1	.0
Other public Health facility	3	.1
Polyclinic	19	.6
Clinic	17	.5
Dispensary	47	1.5
Pharmacy	49	1.6
Family planning clinic	18	.6
Other private health facility	1	.0
Kiosk/Shop/Bar	74	2.4
Friend/Relative	2	.1
Other	4	.1
Don't know	3	.1
<b>Last source for users by type</b>		
Government clinic/pharmacy	1882	59.9
Government home/community delivery	1027	32.7
Private clinic/delivery	102	3.2
Pharmacy	49	1.6
Shop, church, friend	76	2.4
Other	4	.1
Don't know	3	.1
<b>Getting money needed for treatment</b>		
Big problem	3324	48.3
Not a big problem	3555	51.7
<b>Distance to health facility</b>		
Problem	1477	21.5
Not a big problem	5401	78.5

### 3.5. Involvement of men in the FP Program

Table 5 shows that involvement of men in the FP program is highlighted in the decision making for using contraception with her spouse at 89, 8 percent, the person who usually decides on health care in the household is for both respondent and husband/partner with 60, 7 percent. For husband's desire for children with her spouse both want the same with 61, 1 percent.

Men who discussed Family Planning with Community Health Worker in last few months are still in low proportion with 33, 1 percent.

The agreement of men that contraception is woman's business, men should not worry the reality shows that 94.4 percent disagree.

For women who use contraception become promiscuous 93.5 percent disagree.

**Table 5: Involvement of men in the FP Program**

<b>Decision maker for using contraception</b>		
	<b>N</b>	<b>%</b>
Mainly respondent	304	8.3
Mainly husband, partner	68	1.9
Joint decision	3287	89.8
Other	3	.1
<b>Person who usually decides on health care</b>		
Respondent alone	1626	23.7
Respondent and husband/partner	4158	60.7
Husband/partner alone	1057	15.4
Someone else		.1
<b>Husband's desire for children</b>		
Both want same	4124	61.1
Husband wants more	812	12.0
Husband wants fewer	1208	17.9
Don't know	602	8.9
<b>Discussed Family Planning with community health worker in last few months</b>		

No	4148	66.9
Yes	2052	33.1
<b>Contraception is woman's business, man should not worry</b>		
Disagree	5866	94.4
Agree	311	5.0
Don't know	35	.6
<b>Women who use contraception become promiscuous</b>		
Disagree	5807	93.5
Agree	326	5.2
Don't know	78	1.3

### 3.6. Contraceptive prevalence rate of Family Planning program

More than half of the respondents 53 percent reported to use contraceptive methods for to delay or to avoid getting pregnant as shown in table 6.

**Table 6: Ever used anything or tried to delay or avoid getting pregnant**

	Frequency	Percent
<b>Yes, used</b>	3623	52.7
<b>No used</b>	3257	47.3
<b>Total</b>	6880	100

### **II.2.1 Bivariate analysis between independent variables and adherence to FP program**

**Age:** among respondents aged 35 years old and above 53.3 percent are using FP methods while for respondents aged less or equal to 35 years 52.3 percent are using FP methods.

There is no statistical difference between age and use of contraceptive methods (p-value=0.399).

**Education level:** for respondents with secondary level 59.5 percent use contraceptive methods while among those who have primary level 51.5 percent are using contraceptive methods.

There is a statistical difference between education level and contraceptive methods use (p-value=0.001).

**Religion:** among respondent Christians 52.7 percent use contraceptive methods while for those who are in other religion 51.4 percent are using contraceptive methods. There is no statistical difference between religion and use of contraceptive methods (p-value=0.686).

**Husband/partners occupation:** among respondents who did not work 53.3 percent use contraceptive methods while for those who work 52.7 percent are using contraceptive methods.

No statistical difference between husband/partners and use of contraceptive methods was observed (p-value=0.907).

**Respondent occupation:** among respondents who work 52.8 percent use contraceptive methods while for those who don't work 50.1 percent are using contraceptive methods. There is no statistical difference between respondent occupation and use of contraceptive methods (p-value=0.284).

**Wealth index of household:** among respondents who are in rich category 54.1 percent are using contraceptive methods while those who are in poor category 50.1 percent are using contraceptive methods.

There is a statistical difference between wealth index of household and use of contraceptive methods (p-value=0.004).

**Cohabitation duration in years:** among respondents who have less or equal of 9 years of cohabitation 56.8 percent are using FP methods while for respondents with 10 years or more of cohabitation 48.9 percent are using FP methods.

There is a statistical signification between cohabitation duration and use of contraceptive methods (p-value=0.001).

**Ideal number of children:** among respondents who have 3 children ideal number or more 53.9 percent are using FP methods while for those who have less or equal to 2 children 47 percent are using FP methods.

There is a statistical difference between ideal number of children and use of contraceptive methods (p-value=0.001).

**Heard FP on radio last few months:** among respondents who heard FP on radio last few months about use of contraceptive methods 53.1 percent are using FP methods while for those who do not heard FP on radio last few month with 52.2 percent are using FP methods.

There is a statistical difference between heard FP radio last few month and use of contraceptive methods (p-value=0.047).

**Heard FP in newspaper/magazine last few months:** Among respondents who heard FP in newspaper/magazine last few months 61.4 percent are using FP methods while for the respondents who do not heard FP in newspaper/magazine last few months 52 percent are using FP methods.

There is a statistical difference between heard FP in newspaper/magazine last few months and use of contraceptive methods (p-value=0.001).

**Heard FP on TV last few months:** among respondents who heard FP on TV last few months 57.4 percent are using FP methods while for respondents who do not heard family planning on TV last few months 52.2 percent are using FP methods.

There is a statistical difference between heard FP on TV last few month and using FP methods (p-value=0.020).

**Visited by FP worker in the last 12 months:** among respondents who were visited by FP workers in the last 12 months 54.4 percent are using FP methods while for respondents who were not visited by FP workers in the last 12 months 52 percent are using FP methods.

There is no statistical difference between being visited by FP workers in the last 12 months and use of contraceptive methods (p-value=0.076).

**Visited HF in the last 12 months:** for the respondents who visited HF in the last 12 months 53.2 percent are using FP methods while respondents who did not visit HF last 12 months 51.4 percent are using FP methods.

There is no statistical difference between to visit HF in the last 12 months and use of contraceptive methods (p-value=0.175).

**At HF, told about FP:** among respondents having information about FP at HF 53.2 percent are using FP methods while for respondents who did not receive information about FP 51.4 percent are using FP methods.

There is no statistical difference between having information about FP and use of contraceptive methods (p-value=0.658).

**Told about side effects:** among respondents who received information about side effect 71.9 percent are using FP methods while for respondents who did not receive information about side effect 46.3 percent are using contraceptive methods

There is a statistical difference between received information about side effect and use of contraceptive methods (p-value=0.001).

**Told how to deal with effects:** among respondents who have information about how to deal with side effects 72 percent are using FP methods while for respondents who did not have information about how to deal with side effects 45.2 percent are using FP methods.

There is a statistical difference between having information about how to deal with side effects and use of contraceptive methods (p-value=0.001).

**Getting money need for treatment:** among respondents who were getting money needed for treatment 54.8 percent are using FP methods while for respondents who have big problem to get money needed for treatment 50.4 percent are using FP.

There is a statistical difference between getting money needed for treatment and use of contraceptive methods (p-value=0.001).

**Distance to HF:** for the respondents who do not have a big problem for distance to HF 53.5 percent are using FP for while respondents who have a big problem to distance of HF 49.7 percent using FP methods.

There is a statistical difference between distance to HF and use of contraceptive methods (p-value=0.009).

**Decision maker for using contraceptive methods:** among respondents who make decision alone men or women for using FP methods 70.4 percent are using FP methods

while for those who make decision both men and women 51.6 percent are using FP methods are.

There is a statistical difference between decision making for using contraceptive methods and use of contraceptive methods (p-value=0.001).

Table 7 displays the details.

**Table 7: Socio demographic and economic characteristics associated with adherence to family planning program**

<i>Ever used anything or tried to delay or avoid getting pregnant</i>					
	<b>Frequency</b>	<b>% Yes, used</b>	<b>% No used</b>	$\chi^2$	<b>p-value</b>
<b>Age (in years)</b>					
>=35	4176	52.3 (2182)	47.7 (1994)	0.713	0.399
<35	2704	53.3(1441)	46.7 (1263)		
<b>Total</b>	<b>6880</b>	<b>52.7 (3623)</b>	<b>47.3 (3257)</b>		
<b>Education level</b>					
>=Secondary level	997	59.5 (593)	40.5 (404)	21.745	0.001
<= primary level	5883	51.5 (3030)	48.5 (2853)		
<b>Total</b>	<b>6880</b>	<b>52.7 (3623)</b>	<b>47.3 (3257)</b>		
<b>Religion</b>					
Other religion	249	51.4 (128)	48.6 (121)	0.163	0.686
Christian	6631	52.7 (3495)	47.3 (3136)		
<b>Total</b>	<b>6880</b>	<b>52.7 (3623)</b>	<b>47.3 (3257)</b>		
<b>Husband/partner's occupation</b>					
Did not work	75	53.3 (40)	46.7 (35)	0.014	0.907
Work	6805	52.7 (3583)	47.3 (3222)		
<b>Total</b>	<b>6880</b>	<b>52.7 (3623)</b>	<b>47.3 (3257)</b>		
<b>Respondent's occupation</b>					
Not working	417	50.1 (209)	49.9 (208)	1.149	0.284
Work	6463	52.8 (3414)	47.2 (3049)		
<b>Total</b>	<b>6880</b>	<b>52.7 (3623)</b>	<b>47.3 (3257)</b>		
<b>Wealth index</b>					
Poorer	2685	50.5 (1355)	49.5 (1330)	8.505	0.004
Richer	4195	54.1 (2268)	45.9 (1927)		
<b>Total</b>	<b>6880</b>	<b>52.7 (3623)</b>	<b>47.3 (3257)</b>		
<b>Cohabitation duration (in years )</b>					
<=9	3310	56.8 (1879)	43.2 (1431)	43.171	0.001
>= 10	3570	48.9 (1744)	51.1 (1826)		
<b>Total</b>	<b>6880</b>	<b>52.7 (3623)</b>	<b>47.3 (3257)</b>		

<b>Ideal number of children</b>					
<= to 2 children	1263	47.0 (593)	53.0 (670)	20.22	0.001
>= to 3 children	5617	53.9 (3030)	46.1 (2587)		
<b>Total</b>	<b>6880</b>	<b>52.7 (3623)</b>	<b>47.3 (3257)</b>		
<b>Heard family planning on radio last few months</b>					
No	3078	52.2 (1606)	47.8 (1472)	0.522	0.047
Yes	3802	53.1 (2017)	46.9 (1785)		
<b>Total</b>	<b>6880</b>	<b>52.7 (3623)</b>	<b>47.3 (3257)</b>		
<b>Heard FP in newspaper/magazine last few months</b>					
Yes	458	61.4 (281)	38.6 (177)	14.898	0.001
No	6419	52.0 (3340)	48.0 (3079)		
<b>Total</b>	<b>6877</b>	<b>52.7 (3621)</b>	<b>47.3 (3256)</b>		
<b>Heard FP on TV last few months</b>					
Yes	556	57.4 (319)	42.6 (237)	5.440	0.020
No	6321	52.2 (3301)	47.8 (3020)		
<b>Total</b>	<b>6877</b>	<b>52.6 (3620)</b>	<b>47.4 (3257)</b>		
<b>Visited FP worker in the last 12 months</b>					
Yes	1952	54.4 (1061)	45.6 (891)	3.139	0.076
No	4928	52.0 (2562)	48.0 (2366)		
<b>Total</b>	<b>6880</b>	<b>52.7 (3623)</b>	<b>47.3 (3257)</b>		
<b>Visited HF in the last 12 months</b>					
No	1947	51.4 (1000)	48.6 (947)	1.838	0.175
Yes	4933	53.2 (2623)	46.8 (2310)		
<b>Total</b>	<b>6880</b>	<b>52.7 (3623)</b>	<b>47.3 (3257)</b>		
<b>At HF, told about FP</b>					
Yes	2270	53.0 (1204)	47.0 (1066)	0.196	0.658
No	4610	52.5 (2419)	47.5 (2191)		
<b>Total</b>	<b>6880</b>	<b>52.7 (3623)</b>	<b>47.3 (3257)</b>		
<b>Told about side effects</b>					
Yes	1691	71.9 (1216)	28.1 (475)	336.543	0.001
No	5174	46.3 (2393)	53.7 (2781)		
<b>Total</b>	<b>6865</b>	<b>52.6 (3609)</b>	<b>47.4 (3256)</b>		
<b>Told how to deal with side effects</b>					
Yes	1795	72.0 (1293)	27.9 (502)	366.201	0.001
No	5083	45.7 (2328)	54.2 (2755)		
<b>Total</b>	<b>6878</b>	<b>52.6 (3621)</b>	<b>47.3 (3257)</b>		
<b>Getting money needed for treatment</b>					
Big problem	3325	50.4 (1675)	49.6 (1650)	13.465	0.001
Not a big problem	3555	54.8 (1948)	45.2 (1607)		
<b>Total</b>	<b>6880</b>	<b>52.7 (3623)</b>	<b>47.3 (3257)</b>		

<b>Distance to health facility</b>					
Big problem	1478	49.7 (734)	50.3 (744)	6.788	0.009
Not a big problem	5402	53.5 (2889)	46.5 (2513)		
<b>Total</b>	<b>6880</b>	<b>52.7 (3623)</b>	<b>47.3 (3257)</b>		
<b>Decision maker for using contraception</b>					
Decision by men or women alone	372	70.4 (262)	29.6 (110)	49.815	0.001
Both Joint decision	6508	51.6 (3361)	48.4 (3147)		
<b>Total</b>	<b>6880</b>	<b>52.7 (3623)</b>	<b>47.3 (3257)</b>		
<b>Person who usually decides on respondent's health care</b>					
Respondent alone	2690	50.9 (1368)	49.1 (1322)	6.55	0.01
Respondent and husband/partner	4158	54.0 (2246)	46.0 (1912)		
<b>Total</b>	<b>6848</b>	<b>52.7 (3614)</b>	<b>47.3 (3234)</b>		

### III. 3. Multivariate analysis

Multivariate analysis revealed that five variables were identified as factors associated with adherence to FP among married women.

Variables identified that were significant in multivariate analysis include: Education level of married women were identified as factor contributing to adherence to FP program: for those who have secondary level are 1.190 times more likely to use contraceptive than those who have primary level ([p-value= 0.032; 95% CI [1.01-1.39].

Read FP in newspapers/magazine in the last few months has been a factors contributing to adherence to FP program : those who read FP in newspapers are using contraceptive methods 1.73 times more than those who don't not read FP in newspapers/magazine in few months ([p-value=0.043; 95% CI [1.00-1.54]).

Told about how to deal with side effects among respondents who received information about side effect the test has revealed that this factor contribute with adherence to FP program with 2.40 times more than those who don't not receive information on how to deal with side effects ([p-value=0.000; 95% CI [1.77-3.25]).

However cohabitation duration of couples as well as decision making for using contraception is negatively associated with adherence to FP methods.

Cohabitation equals or more than 10 years and a joint decision making negatively influence FP program ([p-value=0.000; 95% CI [0.65-0.82]). ([p-value=0.000; 95% CI [0.41-0.67]

The details are shown in table 8.

**Table 8: Multivariate table analysis**

	<b>OR</b>	<b>95% CI</b>	<b>p-value</b>
<b>Education level</b>			
>= secondary level	1		
<= primary level	1.190	[1.01-1.39]	0.032
<b>Cohabitation duration</b>			
<=9	1		
>= 10	0.73	[0.65-0.82]	0.001
<b>Heard family planning in newspaper/magazine last few months</b>			
Yes	1		
NO	1.73	[1.00-1.54]	0.043
<b>Told how to deal with side effects</b>			
Yes	1		
No	2.40	[1.77-3.25]	0.001
<b>Decision maker for using contraception</b>			
Men or women	1		
Jointly	0.53	[0.41-0.67]	0.001

#### IV.DISCUSSION

In multivariate analysis some of variables were associated to outcome (factors associated with adherence to FP program among married women).

Education level of married women was founded as factor associated more likely to contribute to adherence to FP program among married women (p-value= 0.032). those who have secondary level are (OR=1.190) are more likely to use contraceptive comparison for those who have primary level.

Education is key as it exposes women to information, empowers women, makes them more likely to be employed outside their home environment, and creates more awareness about their own health (34).

These findings are compared with other study in Tanzania where women with at least some secondary education were more likely to use contraceptive with 52 percent (35).

Read FP in newspapers/magazine in the last few months has been also a factors contributing to adherence to FP program (p-value=0.043). For those who read FP in newspapers are more likely to use contraceptive methods (OR=1.73 in comparison with respondent who don't not read FP in newspapers/magazine in few months.

This is also supported by the study from Uganda on Knowledge, sources and use of FP methods among women aged 15-49 where the Knowledge of FP methods was nearly universal (98.1%)(36). To have information on FP are positively for using contraceptive methods use. Also from TDHS 2010 where About one in five women mentioned newspapers/magazines (21 percent) (37).

Told about how to deal with side effects has been a factor associated with adherence to FP methods (p-value=0.000) to have information about side effect. This study supported by the study from Tanzania where most of the users of contraceptive methods got information from HF 65.8 percent(35) and TDHS 210 where majority of users were given information about each of the three issues considered to be essential parts of informed choice; 57 percent were informed about potential side effects(37). This factor supported also by UDHS 2011 where Fifty-six percent of current users of modern contraceptives were informed about potential side effects or problems with the method they use methods(38).

### **Study limitation and implication for future research**

This was a secondary analysis data; we did not have all variables proposed in our conceptual framework. The RDHS also did not collect data on all factors associated with adherence to FP, waiting time, distance to FP service, affordability of services and the core reason for using contraceptive methods which were shown to be significant in predicting the factors associated with adherence to FP.

Finally the study is solely dependent on quantitative data and there is a need to qualitative studies on these explanatory variables.

## **Conclusion and Recommendation**

The main objective of this study was to assess the factors associated with adherence to FP program among married women in Rwanda.

Secondary data analysis of Rwanda Demographic and Health Survey (RDHS, 2015) was used.

Even though there has been a progress in use of contraceptive methods among married women of reproductive age (15–49 years) group in Rwanda with 53% in 2015 from 17% in 2005 there is still a lot of work to be done to reach the aim of the country that was to achieve a Contraceptive Prevalence Rate (CPR) of 70% by the end of 2015 and 90% by 2017 among women in union.

The study revealed that some of variables were positively associated with adherence to FP program: education level, knowledge of contraceptive methods and to have information on how to deal with side effects.

Taking decision about contraceptive use among couples and cohabitation were negatively associated with contraceptive use among married women.

## **Recommendations**

The following recommendations can be given based on the findings from this study:

- ✓ The Government through CHWs should strengthen promotion of education opportunities mostly for women and girls on FP.
- ✓ To strengthen program that encourages the involvement of women and men in FP, increasing knowledge of contraceptive methods, how to deal with side effects and involve both partners in contraceptive use.
- ✓ There should be a qualitative research to provide more explanations about the factors contributing to the contraceptive use and non use.

## References

1. WHO | Family planning. World Health Organization; [cited 2016 Feb 11]; Available from: [http://www.who.int/topics/family\\_planning/en/](http://www.who.int/topics/family_planning/en/)
2. RDHS. Rwanda demographic and health survey. Dhs. 2015;
3. Birth-control | Define Birth-control at Dictionary.com [Internet]. [cited 2016 Feb 11]. Available from: <http://dictionary.reference.com/browse/birth-control>
4. WHO | Unmet need for family planning. World Health Organization; [cited 2016 Feb 11]; Available from: [http://www.who.int/reproductivehealth/topics/family\\_planning/unmet\\_need\\_fp/en/](http://www.who.int/reproductivehealth/topics/family_planning/unmet_need_fp/en/)
5. Osterberg L, Blaschke T. Adherence to medications. N Eng Journal. 2005. p. 487–97.
6. FACTORS RELATED TO THE ACCEPTANCE OF FAMILY PLANNING AMONG THE MARRIED WOMEN IN REPRODUCTIVE AGE [Internet]. [cited 2016 Feb 11]. Available from: [http://s3.amazonaws.com/zanran\\_storage/mulinet10.li.mahidol.ac.th/ContentPages/103745196.pdf](http://s3.amazonaws.com/zanran_storage/mulinet10.li.mahidol.ac.th/ContentPages/103745196.pdf)
7. Global Levels of Contraceptive Use by Married Women Have Risen, Especially in Developing Countries [Internet]. [cited 2016 Feb 25]. Available from: <https://www.guttmacher.org/pubs/journals/3910313.html>
8. Health MOF. FAMILY PANNING STRATEGIC PLAN 2012-2016. 2012;(December).
9. African Countries: List of Countries in Africa By Population [Internet]. [cited 2016 Feb 11]. Available from: <http://answersafrica.com/african-countries.html>
10. MINECOFIN. ECONOMIC DEVELOPMENT AND POVERTY REDUCTION STRATEGY (EDPRS II). 2013;(May).
11. [Http://www.indexmundi.com](http://www.indexmundi.com). Population density - Country Comparison [Internet]. [cited 2016 May 13]. Available from: <http://www.indexmundi.com/g/r.aspx?t=0&v=21000&l=en>
12. Dieudonne MN, Calver RP, Aline U. Measuring the Success of Family Planning. ICF Int. 2013;(February).
13. <http://www.prb.org/Publications>. Human Population: Population Growth [Internet]. [cited 2016 May 13]. Available from:

- <http://www.prb.org/Publications/Lesson-Plans/HumanPopulation/PopulationGrowth.aspx>
14. <http://www.fedena.com/blog/2014/01/10-countries-high-literacy-rate-world.html>. 2014.
  15. Al. PK and. *Macroeconomics, 3rd Edition Economics Books @ Amazon.com* [Internet]. [cited 2016 May 13]. Available from: <http://www.amazon.com/Macroeconomics-3rd-Paul-Krugman/dp/1429283432>
  16. Nargund G. Declining birth rate in Developed Countries: A radical policy re-think is required. *Facts, views Vis ObGyn* [Internet]. 2009;1(3):191–3. Available from: <http://www.pubmedcentral.nih.gov/articlerender.fcgi?artid=4255510&tool=pmcentrez&rendertype=abstract>
  17. <http://keydifferences.com/difference-between-developed-countries-and-developing-countries.html>. Difference Between Developed Countries and Developing Countries [Internet]. [cited 2016 Jun 1]. Available from: <http://keydifferences.com/difference-between-developed-countries-and-developing-countries.html>
  18. Challenges P, Stress E. “The biggest enemy of health in the developing world is poverty.” -. *State of the World*. 2002;2002:3–4.
  19. Dupas P. Health Behavior in Developing Countries. *Annu Rev Econom*. 2011;3(1):425–49.
  20. Jacobs B, Ir P, Bigdeli M, Annear PL, Van Damme W. Addressing access barriers to health services: An analytical framework for selecting appropriate interventions in low-income Asian countries. *Health Policy Plan*. 2012;27(4):288–300.
  21. Access to healthcare in developing countries | Philips. “Innovation and you.” [Internet]. [cited 2016 Feb 11]. Available from: <http://www.philips.com/a-w/innovationandyou/article/article/accessible-healthcare.html>
  22. <https://www.globalcitizen.org>. 10 barriers to education around the world [Internet]. [cited 2016 Jun 1]. Available from: <https://www.globalcitizen.org/en/content/10-barriers-to-education-around-the-world-2/>
  23. Developing UUN. Education Failure in Developing Countries - Report - Pro Bono Australia [Internet]. [cited 2016 Jun 1]. Available from: <http://probonoaustralia.com.au/news/2012/10/education-failure-in-developing->

countries-report/

24. Krishnaratne S, White H, Carpenter E. Quality education for all children? What works in education in developing countries. Int Initiative Impact Eval Work Pap 20. 2013;
25. Planning F. Family Planning in Latin America and the Caribbean. 2015.
26. Muhoza, Ndaruhuye Dieudonné, Broekhuis, Annelet, and Hooimeijer P. Excess Fertility and Family Planning in Rwanda. International Journal of Population Research. 2014.
27. National Institute of Statistics of Rwanda (NISR) M of F and EP (MONECOFIN) [Rwanda]. Rwanda Fourth Population and Housing Census, Rwanda. Thematic report: Population size , structure and distribution. 2012;1–102.
28. National Institute of Statistics of Rwanda. Rwanda Integrated Household Living Conditions Survey. 2014;
29. Planning F. Mexico The Achievements of 50 Years. 2015;(April).
30. Ministry of Education. Education Sector Strategic Plan 2006 - 2010.
31. National Institute of Statistics of Rwanda. Demographic and Health Survey 2014-15. 2014.
32. Health MOF. Family planning policy. 2012;(December).
33. National Institute of Statistics of Rwanda (NISR) M of F and EP (MONECOFIN) [Rwanda]. Rwanda Demographic and Health Survey 2014-15. J Chem Inf Model. 2013;53(9):1689–99.
34. ESKEZEIA YIHUNIE DESSIE A. DETERMINANTS OF CONTRACEPTIVE USE AMONG MARRIED WOMEN IN ETHIOPIA: ORDINARY LOGISTIC AND MULTILEVEL LOGISTIC REGRESSION ANALYSES ESKEZEIA. 2012;(November).
35. Michael EJ. USE OF CONTRACEPTIVES METHODS AMONG WOMEN IN STABLE MARITAL RELATIONS ATTENDING HEALTH FACILITIES IN KAHAMA DISTRICT, SHINYANGA REGION, TANZANIA. 2012;
36. Alege SG, Matovu JK, Ssensalire S, Nabiwemba E. Knowledge, sources and use of family planning methods among women aged 15-49 years in Uganda: a cross-sectional study. Pan Afr Med J [Internet]. 2016;24:1–12. Available from: <http://www.panafrican-med-journal.com/content/article/24/39/full/>

37. Tanzania Bureau of Statistics and Macro International. Tanzania Demographic and Health Survey 2010. Natl Bur Stat Dar es Salaam, Tanzania ICF Macro Calverton, Maryland, USA [Internet]. 2010;1–482. Available from:  
[http://www.measuredhs.com/pubs/pdf/FR243/FR243\[24June2011\].pdf](http://www.measuredhs.com/pubs/pdf/FR243/FR243[24June2011].pdf)
38. UBOS and ICF. Uganda Demographic and Health Survey,2011, Uganda UBOS and Calverton Merryland. ICF Int Inc [Internet]. 2011;5(August):57–67. Available from: <http://www.ubos.org/onlinefiles/uploads/ubos/UDHS/UDHS2011.pdf>