

**MODELLING OF TRADITIONAL FAMILY  
PLANNING USAGE BY WOMEN IN SRI LANKA**

Hiriyamulla Vithanage Vidura Migara Padmajeewa Karunaratne

(179058U)

Degree of Master of Science in Business Statistics

Department of Mathematics

University of Moratuwa

Sri Lanka

June 2021

## DECLARATION

I declare that this is my own work and this thesis does not incorporate without acknowledgement any material previously submitted for a degree or diploma in any other University or institute of higher learning and to the best of my knowledge and belief it does not contain any material previously published or written by another person except where the acknowledgement is made in the text.

Also, I hereby grant to University of Moratuwa the non-exclusive right to reproduce and distribute my thesis, in whole or in part in print, electronic or other medium. I retain the right to use this content in whole or part in future works (such as articles or books).

Signature:

Date:

The above candidate has carried out this research for the Masters thesis under my supervision.

Name of the supervisor: Professor T S G Peiris



Signature of the supervisor:

Date: 12.07.2021

Name of the internal supervisor: Dr. P M Edirisinghe

Signature of the supervisor:

Date:

## **ACKNOWLEDGMENT**

I would like to express my sincere gratitude to my thesis supervisors Professor T.S.G. Peiris, Retired Senior Professor in Applied Statistics, University of Moratuwa and Dr. P M Edirisinghe, Senior Lecturer, Department of Mathematics, University of Moratuwa for their excellent guidance and encouragement given to me throughout the course and throughout my research. And also, I would like to convey my gratitude to Mrs. Ravindi Jayasundara, Senior Lecturer and the Course Coordinator of the MSc/PG Diploma in Business Statistics, for her guidance.

I should mention that I will never complete this Master's degree programme if I was not encouraged by my institutional mentor Professor. Sunethra J. Perera, former Head of the Department, Department of Demography, University of Colombo. Her expertise and enthusiasm have been very much helpful in completion of this thesis and course.

I would like to express my gratitude to Data Dissemination Center, Department of Census and Statistics for providing me the data set of Sri Lanka Demographic and Health Survey 2016.

Also, I would like to convey my sincere gratitude for Ms. Piumi Lankeshwara to her kindful encouragement and all the help given me in completing this thesis.

I acknowledge the support of my family for strengthen me to finalizing the thesis and special thank is dedicated to my colleagues of MSc programme and members of the Department of Demography, University of Colombo for the friendly support and encouragement.

## Abstract

Family planning plays a crucial role in enhancing the health of the mother and the child. Contraceptives are used by most women in the reproductive age span (15- 49 years). Sri Lanka has named as one of the countries with high usage of traditional family planning (TFP) methods than the other Asian countries. However, the reasons for that were not been investigated. Therefore, this study is carried out to identify the significant factors influencing on usage of traditional family planning by using data from Sri Lanka Demographic and Health Survey in 2016 and the sample size is 10835. The modern family planning methods are used by 83.7% women compared to the traditional family planning methods. Among the traditional family planning users, rhythm method is more popular (57.1%) than the withdrawal method (34.9%). The highest percentage of both the traditional and modern family planning methods are used by the women of age between 31-42 years. A binary logistic regression model was developed to capture the factors which influence on the use of traditional family planning methods. The model was invariant on the type of selection method and selection criteria. The overall predictive power is 82.9%. The knowledge on family planning, having advice from public health midwives, attendance to well women clinics, religion, ethnicity, decision to use Family Planning, husband's occupation, women's age, women's occupation, women's education level, number of children, and wealth quantile are significantly associated factors with the usage of traditional family planning. The odds of the usage of TFP among the women having no children and women having 1 or 2 children are respectively 1.4 and 4.0 times higher than the women having 3 or more children. The factors identified are geared towards providing a contemporary, robust evidence base, therefore the key population groups in need of contraceptive services can be targeted more effectively and efficiently. Organizing counselling programmes and promotions on family planning and conduct media awareness programmes to avoid some myths on modern contraceptives can be suggested.

**Keywords:** *Binary Logistic Model, Odd ratio, Traditional Family Planning Methods, Traditional Family Planning Users, Women in reproductive age span*

## TABLE OF CONTENT

Declaration of the candidate & Supervisor	i
Acknowledgment	ii
Abstract	iii
Table of Content	iv
List of Figures	ix
List of Tables	x
List of Annexures	xiii
List of Abbreviations	xiv
Chapter 1: Introduction	01
1.1 Background	01
1.2 Family Planning	01
1.3 Traditional Family Planning Methods	02
1.3.1 Withdrawal Method	02
1.3.2 Rhythm Method	03
1.4 Modern Family Planning Methods	03
1.5 History of Family Planning Movement	06
1.5.1 Period of 1916 - 1962	06
1.5.2 Period of 1970 - 1980	07
1.5.3 Period of 1994 - 2000	08
1.6 History of Family Planning Movement in Sri Lanka	09
1.7 Global Family Planning Trends	09
1.8 Regional Trends on the Use of Family Planning	12
1.8.1 Family Planning Trends in South Asia	13
1.8.2 Family Planning Trends in Sri Lanka	14
1.9 Contraceptive Prevalence Rate – CPR	16
1.10 Problem Statement	18
1.11 Objectives of the Study	18
1.12 Significance of the Study	19
1.13 Outline of the Dissertation	20

Chapter 2: Literature Review	21
2.1 Factors Associated with Family Planning Usage around the World	21
2.2 Factors Associated with Traditional Family Planning Usage around the World	25
2.3 Factors Associated with Traditional Family Planning Usage in Sri Lanka	29
2.4 Factors Associated with Modern Family Planning Usage around the World	31
2.5 Summary of the Chapter 2	33
Chapter 3: <b>Methodology</b>	35
3.1 Data Collection Procedure	35
3.1.1 Sampling Procedure	35
3.1.2 Data Collection Technique	35
3.2 Sample Data Used for the Study	36
3.3 Study Variables	36
3.3.1 Dependent Variable	37
3.3.2 Independent Variables	37
3.3.3 Conceptual Framework for the Study	40
3.4 Data analysis Method	41
3.4.1 Statistical Tools and Methods	42
3.4.2 Pearson's Chi Square Test	42
3.4.3 Spearman's Rank Correlation	42
3.4.4 Logistics Regression	43
3.4.4.1 Binary Logistic Regression Model	43
3.4.5 Odds and Odds Ratio	44
3.5 Data Interpretation Methods	44

Chapter 4: Exploratory Data Analysis	45
4.1 Background characteristics	45
4.2 Distribution of Users by Method of Family Planning and Types	47
4.2.1 Method of Family Planning	47
4.2.2 Type of Traditional Family Planning Method Used by Traditional Users	48
4.3 Demographic Characteristics among Traditional Family Planning Users and Modern Family Planning Users	48
4.3.1 Age	48
4.3.2 Marital Status	49
4.3.3 Sector	50
4.3.4 District by Usage	51
4.3.5 Educational Level	51
4.3.6 Number of Children	52
4.3.7 Family Planning Knowledge and Awareness	53
4.3.8 Person Who Took the Decision to Use Family Planning	54
4.4 Socio- Economic Characteristics among TFP Users and MFP Users	55
4.4.1 Ethnicity	55
4.4.2 Religion	56
4.4.3 Wealth Quantile	57
4.4.4 Women’s Level of Occupation	58
4.4.5 Husband’s Level of Occupation	58
4.5 Programmatic Characteristics among TFP Users and MFP Users	59
4.5.1 Exposure to Family Planning via Media	59
4.5.2 Having Advices from Public Health Midwives	60
4.5.3 Attend to Well-Women Clinics	61
4.6 Summary of the Chapter 4	62

Chapter 5: Factors Influence on Usage of Traditional Family Planning via Separate Binary Models	64
5.1 Influence of Demographic Characteristics on Usage of Traditional Family Planning Methods	64
5.1.1 Influence of Age of Women	64
5.1.2 Influence of Husbands' Age	65
5.1.3 Influence of Marital Status	66
5.1.4 Influence of Number of Children	66
5.1.5 Influence of Women's Education level	67
5.1.6 Influence of Husband's Education level	68
5.1.7 Influence of Sector	69
5.1.8 Influence of Districts by Family Planning usage	69
5.1.9 Influence of Knowledge on Family Planning	70
5.1.10 Influence of Decision to use Family Planning	71
5.2 Influence of Socio-Economic Characteristics on Usage of Traditional Family Planning Methods	71
5.2.1 Influence of Ethnicity	71
5.2.2 Influence of Religion	72
5.2.3 Influence of Wealth Status	73
5.2.4 Influence of Women's Occupation	73
5.2.5 Influence of Husband's Occupation	74
5.3 Influence of Programmatic Characteristics on Usage of Traditional Family Planning Methods	75
5.3.1 Influence of seeking Advice from Public Health Midwife	75
5.3.2 Influence of Exposure to Family Planning via Electronic Media	76
5.3.3 Influence of Exposure to Family Planning via Printed Media	77
5.3.4 Influence of Exposure to Family Planning via Digital Media	77
5.3.5 Influence of Attend to Well Women Clinic	78
5.4 Summary of the Chapter 5	79



Chapter 6: Modelling Overall Impact on Usage of Traditional Family Planning	80
6.1 Association Between Independent variables and Usage of Traditional Family Planning	80
6.2 Impact of Collinearity Among Independent Variables	81
6.3 Training the Model	82
6.4 Validating the Model Using 1/3 of the Data	82
6.5 Comparison of Significant Variables between Both Models	83
6.6 Results of the Model Using Full Data Set	84
6.6.1 Final Model	87
6.6.2 Interpretation of Model 6.2	89
6.7 Summary of the Chapter 6	91
 Chapter 7: Conclusions, Recommendations and Suggestions	 92
7.1 Conclusions	92
7.2 Recommendations	93
7.3 Suggestions	94
 Reference	 95
Annexure 1: SLDHS 2016- Questionnaire	99
Annexure 2: The Chi-Square Statistics of The Independent Variables	131
Annexure 3: Correlation Matrix of the independent Variables	138

## LIST OF FIGURES

Figure 1.1	Contraceptive Usage by Method among Women in Reproductive Age Span by Region, 2019	12
Figure 1.2	Contraceptive Prevalence (any method) among Married or In-Union Women, by Region, From 1970 to 2030	16
Figure 3.1	Conceptual Framework	41
Figure 4.1	Distribution by Method of Family Planning Usage among Ever Married Women in Sri Lanka	47
Figure 4.2	Usage of traditional family planning by method	48
Figure 4.3	Age Distribution of TFP Users and MFP Users	49
Figure 4.4	Sectoral Distribution of TFP Users and MFP Users	50
Figure 4.5	Distribution of Districts by Usage of TFP Users and MFP Users	51
Figure 4.6	Distribution of Number of Children among TFP Users and MFP Users	53
Figure 4.7	Distribution of Knowledge on Family Planning among TFP Users and MFP Users	54
Figure 4.8	Distribution of TFP Users and MFP Users on Person Who Took the Decision to Use Family Planning	55
Figure 4.9	Distribution of TFP Users and MFP Users by Their Ethnicity	56
Figure 4.10	Distribution of TFP Users and MFP Users by Their Wealth Quantile	57
Figure 4.11	Distribution of TFP Users and MFP Users by Their Husband's Occupation Level	59
Figure 4.12	Distribution of TFP Users and MFP Users by Having Advices from PHM	61

## LIST OF TABLES

Table 1.1	The Definitions, Functions and Success Rate of Modern Family Planning Methods	04
Table 1.2	Family Planning Usage Throughout the World and Based on Regions from 1990 - 2030	10
Table 1.3	Worldwide Numbers of Women in Reproductive Age Span that Using Various Contraceptive Methods, 2019	11
Table 1.4	Percentages of Usage by Method among 15- 49 Women those Who Used Family Planning in South Asian Region, 2019	14
Table 1.5	Modern and Traditional Family Planning Prevalence Rate from 1975 – 2016 in Sri Lanka	15
Table 1.6	Contraceptive Prevalence Rates Between Years 1975 – 2016 in Sri Lanka	17
Table 3.1	Independent Variables and Data Labels	37
Table 3.2	Categories and Scores of Knowledge and Awareness of Family Planning	39
Table 3.3	Categories and Percentages of Formulating Residential Districts by Family Planning Usage	39
Table 4.1	Percentage Distribution of Background Characteristics among Family Planning Users	46
Table 4.2	Age Distribution of TFP Users and MFP Users in Sri Lanka by Age Categories	49
Table 4.3	Marital Status among TFP Users and MFP Users in Sri Lanka	50
Table 4.4	Distribution by Educational Attainment of TFP Users and MFP Users	52
Table 4.5	Distribution of TFP Users and MFP Users based on Their Religion	56
Table 4.6	Distribution of TFP Users and MFP Users by Their Level of Occupation	58
Table 4.7	Differences of TFP Users and MFP Users by Exposure to Family Planning via Media	60
Table 4.8	Distribution of TFP Users and MFP Users by Attend to Well-Women Clinics	61
Table 5.1	Details of Coefficients of the Fitted Logistic Model	64
Table 5.2	Details of Coefficients of the Fitted Logistic Model	65
Table 5.3	Details of Coefficients of the Fitted Logistic Model	66
Table 5.4	Details of Coefficients of the Fitted Logistic Model	67

Table 5.5	Details of Coefficients of the Fitted Logistic Model	67
Table 5.6	Details of Coefficients of the Fitted Logistic Model	68
Table 5.7	Details of Coefficients of the Fitted Logistic Model	69
Table 5.8	Details of Coefficients of the Fitted Logistic Model	69
Table 5.9	Details of Coefficients of the Fitted Logistic Model	70
Table 5.10	Details of Coefficients of the Fitted Logistic Model	71
Table 5.11	Details of Coefficients of the Fitted Logistic Model	72
Table 5.12	Details of Coefficients of the Fitted Logistic Model	72
Table 5.13	Details of Coefficients of the Fitted Logistic Model	73
Table 5.14	Details of Coefficients of the Fitted Logistic Model	74
Table 5.15	Details of Coefficients of the Fitted Logistic Model	75
Table 5.16	Details of Coefficients of the Fitted Logistic Model	75
Table 5.17	Details of Coefficients of the Fitted Logistic Model	76
Table 5.18	Details of Coefficients of the Fitted Logistic Model	77
Table 5.19	Details of Coefficients of the Fitted Logistic Model	77
Table 5.20	Details of Coefficients of the Fitted Logistic Model	78
Table 5.21	Summary Table of Significant Variables	79
Table 6.1	Summary Table of Chi-square Test	81
Table 6.2	Statistically Significant Variables in 2/3 of the Data	82
Table 6.3	Statistically Significant Variables in the 1/3 of the Data	83
Table 6.4	Statistically Significant Variables of Both Models	83
Table 6.5	Variables in the Equation for the Final Logistic Model	84

Table 6.6	Classification Table of the Final Model	86
Table 6.7	Model Summary	87

## **LIST OF ANNEXURES**

Annexure 1	Sri Lanka Demographic and Health Survey 2016 – Questionnaire	99
Annexure 2	The Chi-Square Statistics of The Independent Variables	131
Annexure 3	Correlation Matrix of the independent Variables	138

## LIST OF ABBREVIATIONS

AIDS	-	Acquired Immune Deficiency Syndrome
A/L	-	Advanced Level
CPR	-	Contraceptive Prevalence Rate
FPA	-	Family Planning Association
FP	-	Family Planning
GCE	-	General Certificate of Education
HIV	-	Human Immunodeficiency Virus
IUD	-	Intrauterine Device
LAM	-	Lactational Amenorrhea Method
MFP	-	Modern Family Planning
O/L	-	Ordinary Level
OR	-	Odds Ratio
PHM	-	Public Health Midwife
SD	-	Standard Deviation
SLDHS	-	Sri Lanka Demographic and Health Survey
TFP	-	Traditional Family Planning
TFR	-	Total Fertility Rate
UN	-	United Nations
UNFPA	-	United Nations Population Fund
WHO	-	World Health Organization