Childbearing and the Role of Midwifery Care in Sri Lanka

by

K. Dilhani Wijesinghe

B.A. (2011) and M.A. (2014) University of Colombo

Doctor of Philosophy

Department of Language Education

Graduate School of Reitaku University

Japan

March, 2021

Childbearing and the Role of Midwifery Care in Sri Lanka

Name: K. Dilhani Wijesinghe

Reg. No.:1171120010

Thesis submitted to the Graduate School of Language Education in partial fulfillment of requirements for the degree of

Doctor of Philosophy

Reitaku University

Kashiwa, Chiba, Japan

Author …….

Graduate School of Language Education, Reitaku University

Supervised by …….

Satomi Kurosu, Professor of Sociology

Graduate School of Language Education, Reitaku University

List of Committee Members

Professor Satomi Kurosu

Professor Noriko O. Tsuya

Professor Osamu Saito

Professor Andrew S. MacNaughton

Professor K.A.P. Siddhisena

ABSTRACT

This study aims at exploring childbearing practices and the role of midwifery care in Sri Lanka using micro data from Sri Lanka Demographic and Health Survey (SLDHS) conducted in 2016 and interviews with Public Health Midwives (PHMs). National, district, sector and micro level analyses were conducted with a quantitative analysis to ascertain current fertility levels, trends and behavioral patterns related to childbearing. The findings revealed that district fertility levels in Sri Lanka currently remain within a narrow range (TFR 1.8-2.6) compared to previous decades. The results of the micro level analysis showed that currently women tend to have slightly smaller number of children (2.39) compared to their ideal figure (2.54). An ordinary least squares (OLS) regression analysis was utilized to examine the relationship between children ever born (CEB) and women's selected characteristics. Regression results confirmed strong relationships between CEB and demographic, cultural, female autonomy related and contextual factors. While controlling for birth cohort, marriage is identified as the most significant predictor of CEB. Women, who marry early, as well as those in the lowest educational group were found to have higher number of CEB. Muslim and Tamil ethnic groups were predicted to have significantly higher number of CEB compared to Buddhist women. Moreover, preferential behavior to maintain high fertility among Muslim women was emphasized during the study.

PHMs as the key health care provider at the domiciliary level in Sri Lanka were committed to supply essential services associated with maternal and child care while enhancing women's status particularly in rural and estate sectors. Estate women's disadvantaged socio-economic and education background, poor support systems and limited access to contraceptives were highlighted in the study. The above findings suggest that policy makers need to take into account women's demographic, cultural, female autonomy related and contextual factors in order to properly monitor and control fertility in Sri Lanka. Further, PHMs services and family planning programs should be re-designed giving particular attention to estate sector while introducing empowering strategies for estate women.

ACKNOWLEDGEMENT

This doctoral thesis was completed with the guidance and assistance of many dedicated individuals. First of all, an eternal debt is owed to my supervisor Prof. Satomi Kurosu, for her kind guidance, constructive suggestions and untiring support throughout my PhD journey. This thesis would not have been possible without her contribution. It is a great honor and privilege to complete my doctoral study under her supervision at Reitaku University. Though, the final stages were mostly done ensuring social distance due to the corona outbreak, she has made the distance closer in every other sense. Second, I am deeply grateful to the other members of my thesis committee, Profs. Noriko O. Tsuya, Osamu Saito, Andrew S. MacNaughton, and K.A.P. Siddhisena for giving their positive comments and constructive feedbacks to improve my writing. A special thanks also go to all the Professors of the Graduate School of Language Education and Kusumoto san, Kagawa san, and other staff of the graduate school of Reitaku University for giving their kind assistance throughout my academic years.

I am extremely thankful for the financial aid provided by Hattori international scholarship foundation during the last three years. Also many thanks to Reitaku University for offering me a research assistantship via the grant of "Longitudinal Study of Population, Economy, and Family: Construction of Multigenerational Panel Database" Ministry of Education, Culture, Sports, Science and Technology-Supported Program for the Strategic Research Foundation at Private Universities No. S1591001L, 2015-2019 (PI: Satomi Kurosu). The grant was a great help to relieve my financial burden throughout the last three years. Further, I wish to thank Reitaku University for providing me a travel grant to collect data from interviews with PHMs.

I express my sincere gratitude and appreciation to those who have granted permission to collect data for the study. Micro data from SLDHS 2016 was accessed with the permission from the Director General of the Department of Census and Statistics. Especially, I really appreciate the assistance from Mr. Wasantha, Mr. Migara, and Mr. Disala whenever I needed help. The qualitative data was made possible with the permission for the interviews from Regional Directors of Health (RDHS) offices of Colombo and Gampaha districts followed by Medical Officer of Health (MOH) of Battaramulla, Avissawella and Dompe. A very special thank goes to all the doctors and PHMs of three MOH offices who offered their kind cooperation during the data collection procedure especially all the responded PHMs.

Also, a massive thank to all the Professors of the Department of Demography, University of Colombo for giving me a perfect platform to start my academic career.

I am also grateful to Kanno sensei, Profs. Saito and Madono for giving their extraordinary support to achieve my dreams.

Further, many thanks go to my friends in Japan especially, Ohnuma san, Yang san, Manuka and family, Harini Akka and Nadeeka Akka for giving me support, strength and courage during this difficult time.

My deepest gratitude and thanks go to my father, mother and other family members for their benevolent support and encouragement during my period of study. A special thank goes to my mother-in-law, Susantha Ranadheera for her extraordinary support to collect and manage data.

Last but not least many thanks go to my husband Shanaka, for his understanding, motivation, and for helping me to concentrate on my studies.

TABLE OF CONTENTS

List of Tables

List of Figures

List of Maps

ABBREVIATIONS

CBR - Crude Birth Rate

PHM - Public Health Midwife

CDR - Crude Death Rate

CEB - Children Ever Born

CPH - Census of Population and Housing

FHB - Family Health Bureau

HDI - Human Development Index

ICU - Intensive Care Unit

IUD - Intrauterine Device

LRT - Laparoscopic Radical Trachelectomy (female sterilization/ tubectomy)

LTTE - Liberation Tigers of Tamil Eelam

MCH - Maternal and Child Health

MOH - Medical Officer of Health

OLS - Ordinary Least Squares

PHM - Public Health Midwife

SLDHS - Sri Lanka Demographic and Health Survey

SMAM - Singulate Mean Age at Marriage

TFR - Total Fertility Rate

UNDP - United Nations Development Program

UNFPA - United Nations Population Fund (United Nations Fund for Population Activities)

WHO - World Health Organization

CHAPTER ONE

INTRODUCTION

1.1. Introduction

This study examines key aspects of women's childbearing practices and the role of midwifery care mainly based on micro data from Sri Lanka Demographic and Health Survey (SLDHS) conducted in 2016 and interviews with Public Health Midwives (PHMs) working in Sri Lanka. Childbearing can be simply defined as the process of a woman becoming pregnant and giving birth. Among series of women's characteristics, demographic, socio-economic, cultural, female autonomy related and contextual factors may be the primary predictors of childbearing behaviors in Sri Lanka. In particular, being a multi-ethnic and multi-religious developing country in the South Asian region, religious background and education which have direct influence on female autonomy can be strongly associated with childbearing practices in Sri Lanka. Collectively, PHMs have been playing a key role in shaping women's reproductive career at the community level for decades. Being the grassroots level health care professionals, PHMs knowledge and experience on women's childbearing behaviors are highly accepted and appreciated within the country. Hence, the current study explores the role and perceptions of PHMs in childbearing practices in Sri Lanka.

Fertility transition which refers to the fertility decline from a high level to a low level is often dependent on patterns of childbearing of the population. The shift from relatively high fertility to low levels occurred in Sri Lanka over a short period of four decades which is unique in the South Asian context (Abeykoon, 2006; Perera, 2017). According to Caldwell (1987), the demographic transition in Sri Lanka has unusual aspects and certain puzzling features that have not been fully explained. The transition bears greater similarity to that of Europe than to any other part of South Asia, with the possible exception of Kerala. The transition began much earlier than in other South Asian counterparts, making Sri Lanka the leading nation in the South Asian region (Caldwell,

1987). In fact, despite its low level of economic development, being a social welfare state, the country has achieved favorable demographic levels under various government interventions.

Although the minor fluctuations in fertility which have shown in the last decade, Sri Lanka's current TFR, at 2.2, is close to the replacement level of 2.1 (Department of Census and Statistics, 2017). However, still there are significant differentials in childbearing practices and childbearing intentions due to the diverse mixture of various ethnic, religious and cultural groups in the country. In view of various unique features of Sri Lankan fertility transition, the current study analyses key elements of childbearing in Sri Lanka.

1.2. Problem Statement

As a developing country in the South Asian region, Sri Lanka's demographic transition has attracted a great deal of interest among domestic and foreign researchers by representing unique features. Particularly, Sri Lanka became the leading nation of the South Asian fertility transition, though recent fluctuations in fertility have made the transitional process sluggish. So far, several studies have analyzed fertility levels and trends in Sri Lanka (Perera, 2017; Fernando, 1976). However, there is a dearth of studies on recent national and district fertility levels and trends in Sri Lanka particularly after the sluggish trend of fertility decline occurred at the beginning of the 21st century.

As a multi-ethnic and multi-religious developing country, women's characteristics are crucial in determining childbearing practices. However, no recent studies have given attention to women's characteristics. In particular, the relationship between fertility and women's demographic, cultural, female autonomy related and contextual factors have not been assessed recently. As a result, little is known about primary predictors of fertility and recent differential childbearing practices in Sri Lanka.

Other than the impact of socio-cultural, ethnic-religious and economic factors, local government bodies have made effective interventions towards the childbearing behaviors of women in Sri Lanka particularly through PHMs. Accumulated studies indicated that the

contribution of PHMs, which includes midwifery training and broad use of high quality professional care from trained PHMs, is one of the distinctive factors of Sri Lankan maternal and child health success (Levine, 2007; Ronsmans et al., 2006; Daniel, 2016). Silva (2011) indicates that PHMs services are immensely valued in rural settings where health resources are scarce. As the majority of people in Sri Lanka live in the rural areas, a higher proportion of PHMs are recruited and encouraged to work in the rural settings. In order to develop a contemporary image of midwifery care in urban, rural and estate sectors in Sri Lanka, it is worthwhile to ascertain the role and responsibilities of PHMs. Although there are numerous studies on PHMs (Beneragama, 1991; Palipane, 1997; Fernando, 1997; Balasuriya et al., 2008; Jayatilleke et al., 2015; Siriwardhana, 2019), previous studies have not touched on the vital role in shaping women's reproductive career and perceptions of PHMs regarding childbearing practices of women based on residential sector.

Addressing the motivations listed above, the main research questions that this study seek to answer are as follows.

I. What are the recent trends and patterns in fertility following the sluggish fertility transition occurred at the beginning of the 21st century?
II. What are the main factors and women's characteristics that determine childbearing practices in Sri Lanka as a multi-ethnic and multi-religious developing country?
III. What is the current progress and future challenges to deliver effective and high quality midwifery care in Sri Lanka?

1.3. Research Objectives

Arising from the problem statement above, the study aimed at exploring childbearing behaviors and the role of midwifery care in Sri Lanka. More specifically, the author attempted to address the following specific objectives.

1. To analyze historical fertility transition in Sri Lanka giving particular attention to national and district fertility levels.

2. To examine the influence of proximate determinants of fertility in shaping district fertility levels in Sri Lanka.
3. To explore sectoral variations in childbearing in Sri Lanka.
4. To assess the relationship between Children Ever Born (CEB) and demographic, cultural, female autonomy related and contextual factors of women in Sri Lanka.
5. To explore differential childbearing practices relating to marriage, childbearing preferences, contraceptive behavior and CEB in Sri Lanka.
6. To discuss the relationship between women's relative status, women's autonomy and power on childbearing decision making in Sri Lanka.
7. To analyze the role and the perceptions of PHMs in childbearing practices.

Chapter 6 of this thesis is devoted to achieve specific objectives 1 and 2 while chapter 7 deals with specific objectives 3, 4, 5 and 6. Finally, chapter 8, which is devoted to explore the role and perceptions of PHMs is aimed to achieve specific objectives 3, 6 and 7.

1.4. Rationale of the Study

Fertility is the most important factor which determines the size, growth and composition of population in a country. Most precisely, fertility analysis is important in understanding past, present and future trends of population size, growth and composition. The information on fertility levels, patterns and trends experienced by a country is important for socio-economic planning, monitoring and evaluating programs. There may be significant differentials in childbearing practices of women in Sri Lanka particularly following the recent slower pace of fertility decline. So far however, little is known about the recent differential childbearing practices. Therefore, it is vital to monitor the childbearing practices of women at the national, regional, sector and micro level.

Being a multi-ethnic and multi-religious developing country, women's characteristics associated with demographic, cultural, female autonomy related and contextual factors are crucial for determining childbearing practices in Sri Lanka. In particular, women's autonomy is a

significant dimension in explaining the childbearing behaviors in Sri Lankan society. However, no recent study has been found that surveyed women's characteristics associated with current fertility. Therefore, the current study attempts to assess the level of women's autonomy in Sri Lankan context based on women's education level. Moreover, the study qualitatively evaluates the status of women and their decision-making power to use contraception. Accordingly, the current study offers new insights into the women's empowerment processes and policies.

From the beginning of the twentieth century, PHMs in Sri Lanka have been involved and monitored childbearing practices at the community level. While empowering women to care for themselves and their families, PHMs provide antenatal care and relevant services. Allowing Sri Lanka's success story to be shared with other South Asian countries in the region, the current study discusses the role and perceptions of PHMs regarding the women's childbearing behaviors in Sri Lanka. Hence, the current study is one of the first studies which explores the childbearing practices and the role of PHMs from PHMs as well as women's perspectives.

1.5. Ethical Considerations

Social research can be seen as an intrusion or intervention into people's lives as most studies seek personal information from respondents. No one has a right to intervene in the lives of others in a way that disturbs or destroys their rights. Therefore, it is essential to be concerned about research ethics.

Ethical considerations are highly relevant throughout the current study as it involves human subjects. The author strictly adhered to widely accepted ethical principles and standards throughout the study as prescribed in the ethical guidelines for research on human subjects' course at Reitaku University (see detailed ethical rules of Reitaku University regarding research involving humans[1]).

[1] Ethical Codes for Research Involving Human Subjects at Reitaku University: https://youran.reitaku-u.ac.jp/?page_id=1362 [Accessed 30/08/2020].

The permission to use micro data from Sri Lanka Demographic and Health Survey (SLDHS) conducted in 2016 was obtained from the Department of Census and Statistics in Sri Lanka. SLDHS data are anonymous and often protect the personal identification details of the respondents. Before each interview, an introduction of the SLDHS survey was provided to the respondents together with an informed consent sheet, securing their voluntary participation in the survey. Each interview was performed as privately as possible since the questionnaire deals with highly emotional, sensitive, and private topics.

Similarly, each respondent's privacy and confidentiality was highly guarded in the process of qualitative data collection from PHMs. Prior to starting interviews with PHMs, the interviewee was given one copy of a signed form information sheet together with an informed consent form. Through the information sheet, respondents were informed about the purpose and field of study, the researcher's information, etc. All the PHMs were asked to sign a written consent form confirming the participant's voluntary participation in the interview. Thus, all the prospective PHMs had the opportunity to understand the basic details of the study and each respondent gave written informed consent prior to the interview. Aside from this, oral consent was obtained to record each interview before the interview commenced.

Moreover, data collection, analysis and interpretation were done without any bias to specific social and cultural groups. Additionally, when using the secondary data for the study, the sources are clearly mentioned.

1.6. Limitations of the Study

The SLDHS 2016 was conducted by Department of Census and Statistics to provide reliable and updated data on broad range of subjects such as maternal and child health, nutrition, reproductive health and child survival etc. Therefore, the current study used micro data from SLDHS 2016 to examine major aspects of childbearing in Sri Lanka. However, SLDHS data have been collected to meet specific objectives that are not similar to the objectives of the current study. Hence, there were some limitations when using SLDHS micro data to achieve all the objectives

of the current study. Particularly, the survey was not designed to collect women's perceptions on midwifery care. As a result, the analysis of this study had to be conducted depending on the availability of micro data from SLDHS 2016.

Secondary data is very important for a research study. Books, research publications, reports, and printed journals on childbearing in Sri Lanka are rarely available in Japan. The outbreak of novel coronavirus was felt to be a major barrier during the current study as it caused the imposition of social isolation and travel restrictions. Hence, there were limited opportunities to collect secondary data and to meet the experts in the field and local community. Consequently, the study became heavily dependent on e-books, e-journals, internet web sites and video conferencing technology.

Finally, a few limitations of the study of PHMs need to be acknowledged. This was only a preliminary attempt to complement the qualitative data on the role and perceptions of PHMs regarding the women's childbearing behaviors in Sri Lanka. In fact, as there was no adequate secondary data, it was necessary to provide primary data on the role and perceptions of PHMs in childbearing practices to achieve the objectives of the current study. However, as it was difficult to cover the entire population of PHMs due to bottlenecks such as time, labor and money needed for a wider investigation, the study had to be limited to 16 PHMs working in Colombo and Gampaha districts.

Though several limitations and barriers emerged, the author made every possible effort to successfully achieve the study objectives of the study.

1.7. Chapter Outline of the Study

The current study consists of nine chapters. Having introduced major introductory components in the first chapter, chapter two presents the background information of Sri Lanka to provide a general understanding of the demographic and socio-economic context in which the current study takes place.

The third chapter reviews various theoretical approaches and models which explain childbearing behavior including demographic transition theory, wealth flows theory of fertility decline, diffusion of innovations theory, life history theory, theory of planned behavior (TPB) and the Easterlin model of fertility and the proximate determinants of fertility. The aim of the chapter is to construct a theoretical framework while assessing whether and to what extent various theories are suitable to explain the fertility transition and childbearing behaviors in Sri Lanka.

The fourth chapter presents an extensive literature review of the relevant empirical literature. The review allows the identification of research gaps in the field of study and an illustration to show how the present study deviates from the previous studies. Finally, based on theoretical and empirical literature, discussed in chapter 3 and 4, the conceptual framework of the study is presented.

The fifth chapter provides the data sources and the methodology of the study. The chapter shows how both qualitative and quantitative approaches are integrated to accomplish the objectives of the study. The chapter consists of data sources, quantitative (SLDHS 2016) and qualitative (interviews) data collection procedures and methods of data analysis etc.

The sixth chapter is devoted to analyzing fertility levels and trends in Sri Lanka based on a district approach. After reviewing the national levels and trends of fertility, the changes in district fertility levels, and the influence of proximate determinants of fertility in shaping district fertility levels are discussed. While providing a concise summary of the social context in Sri Lanka, the chapter discusses how district fertility levels converging to a rate just above two children per woman based on SLDHS 2006/07 and 2016.

The seventh chapter analyzes the behavioral patterns related to childbearing using micro data from SLDHS 2016. Sector specific characteristics, the differentials in age at first marriage, childbearing preferences, contraceptive behavior and CEB is assessed descriptively by women's background characteristics. Finally, the relationships between CEB and demographic, cultural,

female autonomy related and contextual factors are statistically tested using an ordinary least squares (OLS) regression model.

Chapter eight discusses the role and perceptions of PHMs in childbearing practices based on residential sectors in Sri Lanka. The chapter first analyzes the quantitative data relevant to PHMs using SLDHS 2016. Second, a qualitative analysis is carried out on sectoral characteristics of PHMs working areas, PHMs' training and services, PHMs' perceived fertility intentions and contraceptive behavior of women, PHMs' perceived support from family members in childbearing and childcaring.

Assessing to what extent the objectives of the current study have been achieved, chapter nine deals with the summary and the conclusion. Finally, suggestions are made for policy implications and further research.

CHAPTER TWO

Sri Lanka: The Country Setting and Demography

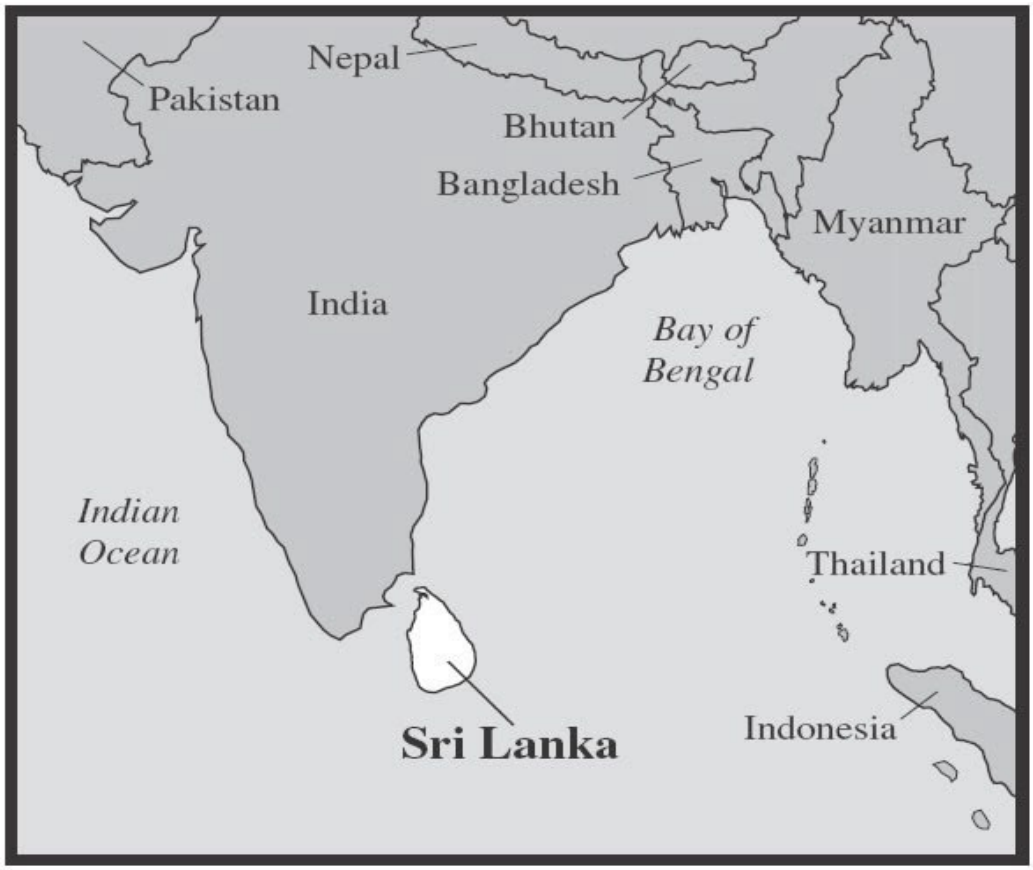
2.1. Introduction

Sri Lanka, officially known as the Democratic Socialist Republic of Sri Lanka, is an island nation which was formerly known as Ceylon, Serendib and Taprobane. The country is also referred as the Pearl of the Indian Ocean and the gem island. According to the Census of Population and Housing (CPH) 2012, the country is home to 20.4 million people in a multi-ethnic and multi-religious population. Sinhalese (74.9), who comprise three-quarters of Sri Lanka's population are mostly Buddhists (70.1%). There are also substantial proportions of Sri Lankan Tamils (11.2%), Indian Tamils (4.1) and Muslims (9.3%). Hinduism (12.6%) is the second largest religion while 9.7 percent of the population follow Islam. Providing a basic understanding of the population and special demographic features of the country, this chapter presents geography, history, economy, family system, population trends, the demographic success story and establishment and evolvement of midwifery services in Sri Lanka.

2.2. Geography

With only 65,610 sqkm of land mass, Sri Lanka is a tropical island in the South Asian region surrounded by the Indian Ocean; it is to the southwest of the Bay of Bengal and to the southeast of the Arabian Sea.

Map 2.1: Geographic Location of Sri Lanka



Source: https://sites.google.com/a/mkis.edu.my/country-portfolios-ib-eco-16/1-development/sri-lanka

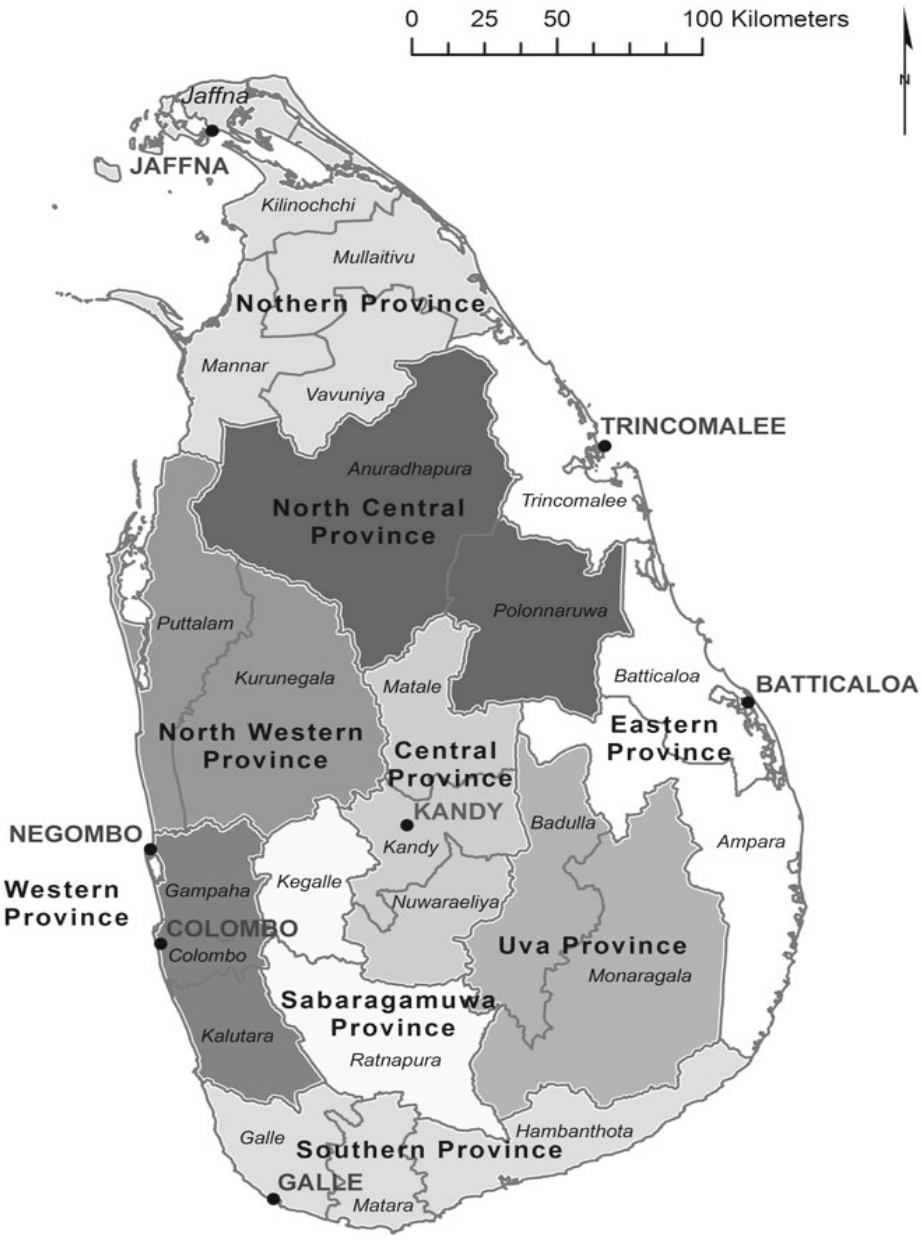
The country has a warm climate throughout the year. The temperature of the country oscillates between 24.3 °C (75.7 °F) and 31.8 °C (89.2 °F) in the low country while the up country ranges between 18.2 °C (64.8 °F) and 27.2 °C (81.0 °F) (Central Bank of Sri Lanka, 2016). The rainfall pattern in the country is dominated by two monsoon seasons, the northeast monsoon from December to March and the southwest monsoon from June to October. Other than the groundwater, farmers in Sri Lanka are heavily dependent on monsoon rains as the main source of water supply for Agricultural practices. Heavier monsoon rains often result in flooding and landslides.

The country is rich in natural resources such as arable lands, gemstones, limestone, graphite, minerals, nature and wildlife, etc. Particularly, Sri Lanka has plenty of natural and cultural

attractions including beaches, mountains, waterfalls, the ancient city of Sigiriya, the sacred cities of Kandy and Polonnaruwa and Adam's Peak, etc.

According to the CPH 2012, the population density of the country is 323 per square kilometer. Despite that, more than half of the island's population is concentrated in Western, Central and Southern provinces of the country. Districts are the second-level administrative division in the country and currently Sri Lanka consist of 25 districts organized into 9 provinces (Map 2.2). In Colombo district, where the highest concentration of people is located, the population density is 3,438 persons per km^2, as recorded by CPH 2012.

Map 2.2: Administrative District and Province Map of Sri Lanka



Source: Nahallage, Huffman and Kuruppu, 2009

Sri Lanka's residential sectors in other words human settlements consist of three main sectors: the urban (all areas administered by Municipal and Urban councils), the estate (all plantations which are 20 acres or more in extent and with ten or more resident laborers), and the rural (all areas other than urban and estate). More people live in rural areas in the country (Department of

Census and statistics, 2009). Generally, the proportion of urban, rural, and estate populations largely varies by districts in Sri Lanka.

2.3. History

Ceylon (Sri Lanka), being an island near hundreds of ancient trade routes and rich in natural resources, was attractive to a number of foreign invaders. Consequently, the kings of Ceylon had to face a series of foreign invasions starting from 1505. The coastal areas of the island were ruled by the Portuguese (1505-1658), the Dutch (1658-1796) and the British colonizers (1796-1948). During the 19th and 20th centuries under the British rule, Indian Tamils were brought to Sri Lanka to work in tea, rubber and coffee plantations. Following the Kandyan wars, the whole island became a British Crown colony in 1815. After that, British rulers controlled the country though there were several rebellions for independence. Finally, the country gained independence from British rulers in 1948. However, the country was considered as a Dominion of the British Empire until 1972. With a new constitution in 1978, the name of the country was renamed as the "Democratic Socialist Republic of Sri Lanka".

Ethnic tensions in the north and eastern parts of the country led to a brutal civil war in 1989. The civil war between the Sri Lankan Army and the Liberation Tigers of Tamil Eelam (LTTE) which claimed a separate state for living in northern and eastern parts of the country lasted nearly three decades. The LTTE was defeated by the Sri Lankan Army in 2009, marking the end of the Sri Lankan civil war. Though there are no precise records, it has been estimated that there were 70,000 to 90,000 deaths, 350,000 displaced people and 1 million refugees due to the civil war in Sri Lanka (Humanity House, 2017).

2.4. Economy

Successive governments of Sri Lanka have integrated free market economy policies as a pioneer country in the region. The country was also successful in achieving the millennium development goals. However, the country still remains a lower-middle-income country with a per capita income of USD 3,924 (2015). The GDP consists of agriculture (7.9%), industry (26.2%),

services (56.6%) and taxes less subsidies on products (9.3%). In 2016, the real GDP growth rate was 4.8 percent (Central Bank of Sri Lanka, 2016).

Tea, rubber and coconut were treated as the major agricultural crops from the British Colonial government period and the Sri Lankan economy has traditionally been considered as an agricultural economy. However, currently the Sri Lankan economy has converted to a free market economy. The civil war (1983-2009) severely disrupted the economic growth of the country. Following the end of the war, foreign investment has grown significantly. Most recently, the labor force participation rate in the country ranged from 53 to 54 during the period of 2011 to 2015 while the unemployment rate was 4.7 in 2015 (Central Bank of Sri Lanka, 2016).

2.5. Family System in Sri Lanka

Over the last few decades, there has been gradual transformation of the family system in Sri Lanka from extended family to nuclear family. According to Caldwell, “The Sri Lankan family is essentially the conjugal unit of husband, wife and dependent children whereas in northern South Asia agnatic relations between son and parents are central to family structure” (Caldwell, 1996:45). Hence, the status of women in Sri Lanka is relatively high among other South Asian counterparts. With no gender difference, both men and women can legally own, use, transfer and inherit land and other properties. However, most families are more likely to distribute their properties among sons while a male dominated patriarchal system is still prevalent in Sri Lanka making men predominate in family and society.

Traditionally in a 'patriarchal' system, women were considered as weak and were often protected or controlled by male members of the family. Women’s roles were confined to household work, childbearing and childcaring, while taking care of elders. Nevertheless, women had limited employment opportunities in fields such as teaching and nursing. Even so, reflecting the fact that women's social status, employment possibilities and gender equality have significantly increased, Sri Lanka elected the world's first female Prime Minister, Sirimavo Bandaranaike in 1960. It follows that most women in contemporary Sri Lanka have attained

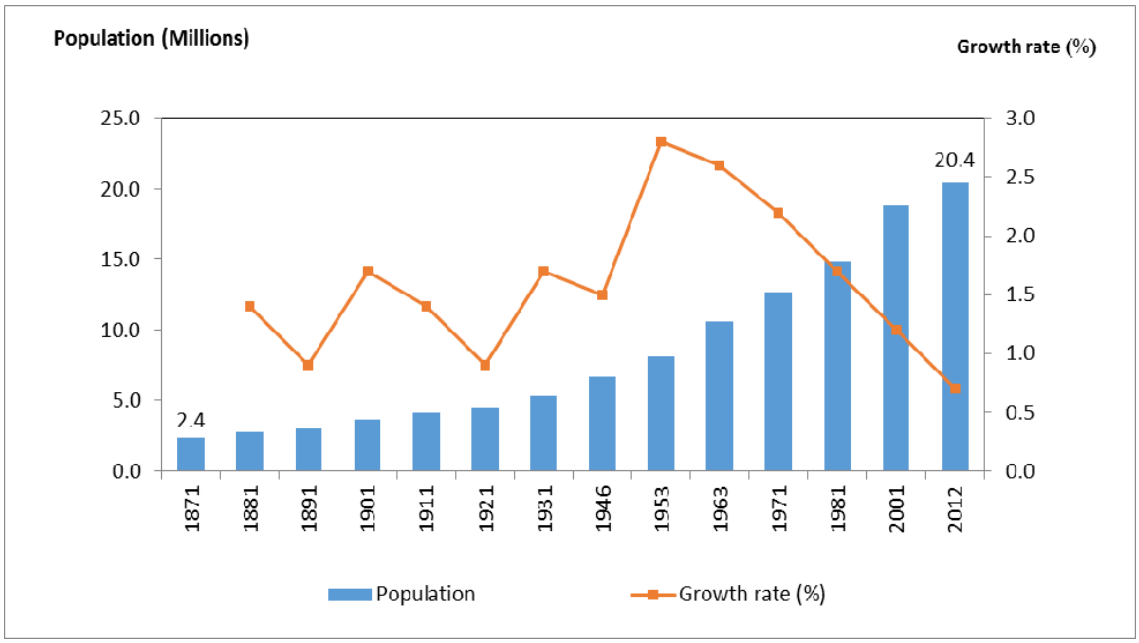
considerable power and decision-making autonomy and independence through education and employment opportunities.

During the past few decades, the marriage system in Sri Lanka has dramatically changed from arranged marriages to love marriages, giving women more freedom to choose their future partners. It follows that the custom of dowry is also disappearing from society. Following the marriage, most couples choose to form a new household separate from families of origin, giving more autonomy, power, freedom and responsibility to women. However, still there are significant differentials in decision making power among various ethnic and religious groups. Overall, women's autonomy and decision-making power has significantly increased to allow her own decisions regarding education, employment, marriage and childbearing, etc.

2.6. Population Trends

In order to collect information on various demographic and socio-economic characteristics, Sri Lanka has a long history of conducting national population censuses since 1871. Thereafter, decennial censuses have been conducted though there are certain exceptions. The most recent population census was conducted in 2012 and the population had increased to 20.4 million since 1871 (Figure 2.1). The average annual growth rate of population has declined from the highest 2.8 in 1953 to the lowest 0.7 in 2012 (Department of Census and Statistics, 2015). Despite the fact that the average annual growth rate of population in Sri Lanka has declined, the size of population is still increasing due to the higher proportion of women in the reproductive age group.

Figure 2.1: Population size and growth, 1871-2012



Source: Census of Population and Housing, 2012

Sex ratio of the population has declined from 108.2 in 1963 to 93.8 in 2012 reflecting a female biased sex composition. However, without reflecting any particular sexual preference, the sex ratio at birth in Sri Lanka ranged between 104 and 105 over the period of 1962 to 2017 (United Nations Population Division, 2019). The Median age of the population was 30 years as estimated in 2012. The median age for males was 30 years while median age for female was 31 years (Department of Census and Statistics, 2015).

In this context, to provide the reader with a general understanding of the demographic processes that have taken place so far, it is worthwhile to evaluate Sri Lanka's demographic transition (discussed in more detail in section 6.2). Particular attention was given to fertility transition as it reflects how childbearing patterns have changed over time.

High fertility levels, which prevailed until the 1960s in Sri Lanka, experienced a spectacular decline towards a replacement level of fertility within the last few decades. Thus, the total fertility rate (TFR) dropped from 5.3 in 1953 to 2.2 in 2016, reflecting a decrease of approximately 3 children per woman. Given the above, Sri Lanka has experienced a rapid fertility transition.

However, fertility transition in Sri Lanka began even without the presence of sufficient preconditions in order to undergo a fertility transition, such as economic growth and government family planning programs (Abeykoon, 2006). Therefore, it is important to explore the major driving forces behind the historical fertility decline. Existing studies on fertility in Sri Lanka have categorized major driving forces into four groups: change of female age composition, change of proportion married, changing marital fertility and diffusion of traditional and modern contraceptive methods (Jayawardena and Selvaratnam, 1967; Wright, 1968; Fernando, 1972; Caldwell et al., 1987).

The initial decline of the crude birth rate from 1953 to 1963 was largely attributable to change in the female age structure of the population (Jayawardena and Selvaratnam, 1967). According to one of the earliest studies on Sri Lankan demography by Sarkar (1957) a rise of 3.3 years in female age at first marriage can be seen between 1919 and 1921 and again between 1939 and 1941. A decade after this significant increase in the age at first marriage, the birth rate became more or less constant. There certainly remains the possibility that fertility regulation within marriage intensified during the economic depression of the 1930s. In 1951, fertility began a persistent major decline for the first time (Caldwell et al., 1987). Several scholars have suggested that fertility decline in the 1960s was mainly due to the rising female age at marriage (Siddhisena, 2000; Wright, 1968; Fernando, 1972; Alam and Cleland, 1981; Abeysekera, 1982). Moreover, Fernando (1972) claims that the decline in fertility during 1963 to 1969 was due to decreasing proportions of ever married women particularly in the age group 20 to 24. Another major factor for the substantial decline in fertility was falling marital fertility (Department of Census and Statistics, 1974; Alam and Cleland, 1981; Retherford and Rele, 1989).

Dissanayake (1995) claims that the effective national family planning program launched after 1979 was largely responsible for the continuance of the fertility transition in Sri Lanka. According to Caldwell et al. (1987) the widespread use of traditional fertility control, particularly rhythm and withdrawal methods also had a great impact on fertility decline in Sri Lanka. It is

evident that the above four factors have mainly contributed to the fertility decline in Sri Lanka though their significance varied largely over the periods. Further, Perera (2017) points out that other than the four main proximate determinants of proportion married, use of contraception, postpartum infecundability and induced abortions, several other contextual factors, including women's education, women's employment participation, infant and child mortality, availability of free health service and cultural factors also contributed to the decline in fertility in Sri Lanka. Moreover, Dissanayake (1995) emphasizes the particular role of mass education on the onset of the fertility transition and its relationship with subsequent fertility change in Sri Lanka. According to his argument, the commencement of mass education occurred just 15 years prior to the onset of the fertility transition. However, there may be a number of other factors which have contributed to the fertility decline in Sri Lanka, but have not been properly assessed yet.

2.7. Demographic Success Story

Over the past few decades, despite its low level of economic development, Sri Lanka has been able to achieve remarkable success in various health indices especially in maternal and child health (MCH). Sri Lanka has been considered as the forerunner in Asia in mortality and fertility declines (Wijesekere and Arunachalam, 2015). Sri Lanka's fertility level is unique in the South Asian context since it has recorded the lowest TFR of 2.1 for the period of 1990 to 2000 (Siddhisena, 2000). Due to the tireless efforts of many stakeholders, currently Sri Lanka reports the highest Human Development Index (HDI) (0.780) and the lowest maternal mortality ratio (30 per 100,000 live births) and the second highest life expectancy (76.8) among its South Asian counterparts (Human Development Report, 2019).

Despite the negative impacts of continuous foreign invasions and 26 years of war, being a social welfare state, the country has achieved favorable demographic levels. The new education reform for free education in 1945 allowed more children to receive formal education while inducing social movement and accelerating economic change in the country (Dissanayake, 1995). As a result, Sri Lanka became the first South Asian country to have achieved a replacement level

of fertility even before the dawn of the new century (De Silva, 1994). Hence, Sri Lanka has been considered a well-known example to prove that it is possible for fertility in poor populations to drop to the replacement level provided literacy and life expectancy are high (Bongaarts, 2002). The implementation of free health services (1951) reduced the death rates and the government's robust family planning programs (early 1970s) led to a significant decline in the birth rate (Menike, 2014). However, it is surprising to note that most reproductive changes in Sri Lanka occurred in the absence of any aggressive state family planning program (Sathar and Phillips, 2001).

The introduction of the universal education system has had a major contribution in demographic achievements in Sri Lanka. The 'Universal Free Education Policy' was introduced in 1945 to provide education facilities to all students from kindergarten to the university level. During the 1950s and 1960s, the government spent about 4 percent of the GDP on education. As a result, Sri Lanka has achieved remarkable levels of literacy and school enrolment rates while reducing gender gaps, compared to many other developing countries in the world (Tilakaratna, 2006; Liyanage, 2013). According to CPH 2012, 96 percent of persons over 10 years of age are literate (Department of Census and Statistics, 2015).

Moreover, the literacy ratio between the sexes is 96.9 percent for males and 94.6 percent for females. Accordingly, on the subject of the population's literacy, Sri Lanka enjoys a very high position among the countries in South Asia. Currently, 93.3 percent of the children in the age group of 5 to 14 years receive a systematic education. The higher levels of literacy rates and education levels are associated with compulsory education up to 14 years of age, availability of free education up to university level, and the provision of text books and support material in education (Department of Census and Statistics, 2015).

As described so far, great strides have been made in ensuring education rights, without leading to discrimination against women. Increased educational opportunities, which enhance female autonomy, have significantly contributed to improve the status of women in the society. In fact, educational achievements help expand employment opportunities for women while increasing the

power to select marriage partner and the range of family decision making. Due to the free education and health policies, between 1990 and 2018, Sri Lanka's HDI value increased from 0.625 to 0.780, an increase of 24.9 percent. Sri Lanka is now (2018) ranked at 71 out of 189 countries in the HDI, the highest rank out of all its South Asian counterparts (UNDP, 2019). According to SLDHS 2016, it shows a declining trend in all indicators of infant and child mortality. The infant mortality rate is 10 per 1,000 live births while the under 5 mortality rate is 11 deaths per 1,000 live births. The maternal mortality rate is 29 per 100,000 (2013) live births (Central Bank of Sri Lanka, 2016). The average life expectancy in Sri Lanka in 2018 was as high as 78.5 years for women and 72.1 years for men (WHO, 2018).

These demographic achievements in Sri Lanka were possible mainly due to its policy approaches. Sri Lanka holds a unique position in South Asia as one of the first of the less developed nations to provide universal health and free education (Hironori & De Silva, n.d). Particularly, the provision of comprehensive maternal, family planning, and child care services through a well-organized structure at institutional and community levels, using professionally trained health personnel (PHM) have mainly contributed to the success (FHB and Ministry of Health, 2011).

2.8. Establishment and Evolvement of Midwifery Service in Sri Lanka

Efforts to improve maternal and child health in Sri Lanka form a rich history from their beginnings in the colonization period. According to FHB (2011), the organized maternal health efforts in Sri Lanka date back to 1879, with the opening of the De Soysa Lying-in-home (currently De Soysa Hospital for Women), probably the first maternity hospital to be established in Asia. The first training school for midwives was opened there in 1881. Legislation for registering midwives was introduced in 1887, making it mandatory for all midwives to be registered prior to practicing midwifery. In 1902, a maternal and child health department was created within the Colombo Municipality.

A system of field maternal services commenced within the Colombo Municipality in 1906 with the appointment of six midwives. The first antenatal clinic started at the De Soysa Lying-in-home in 1921. In 1926, the first health unit was established and by 1936, eight health units were established across the country. With the establishment of the health unit system, the midwives were given one month of field training in public health midwifery and appointed to the health units as PHMs. After 1938, the PHM's training was more systematized and the field training was extended to six months. The number of trained midwives increased from 347 in 1941 to 8,741 in 2009 (FHB, 2011). According to Midwives' Voices, Midwives' Realities Report (2016), there are three categories engaged in midwifery services in Sri Lanka.

(1) Midwives who have completed a one and a half years' full-time midwifery course and obtained a diploma certificate and a license to practice midwifery. They work in the field and hospitals. They are full-time workers engaged only in midwifery.

(2) Nurses who have obtained six months in-service midwifery training.

(3) Midwives, who after one and a half years' training, and five years' service, have completed a three-year nursing course and are designated as nurses.

Through regular home visits, PHMs provide care to pregnant women, mothers, infants and children together with family planning services. PHMs are responsible to serve within a certain demarcated area and each PHM is responsible for a population ranging from about 2000 to 4000 (FHB, 2011). All PHMs perform regular field visits within their working area in order to satisfy health needs and ensure the well-being of mothers and children in the country. They empower women especially in rural and estate settings and motivate couples to make informed and healthy choices. More detailed information on current midwifery system is provided in chapter 7.

2.9. Summary

This chapter provided the reader with a basic understanding of the country, social context and its population. In particular, attention was drawn to the demographic achievements of the country with the provision of free education and health facilities. Finally, the establishment and

the evolvement of the midwifery system in Sri Lanka was presented to describe the key role of the midwifery system in ensuring the demographic success in Sri Lanka.

CHAPTER THREE

THEORETICAL FRAMEWORK

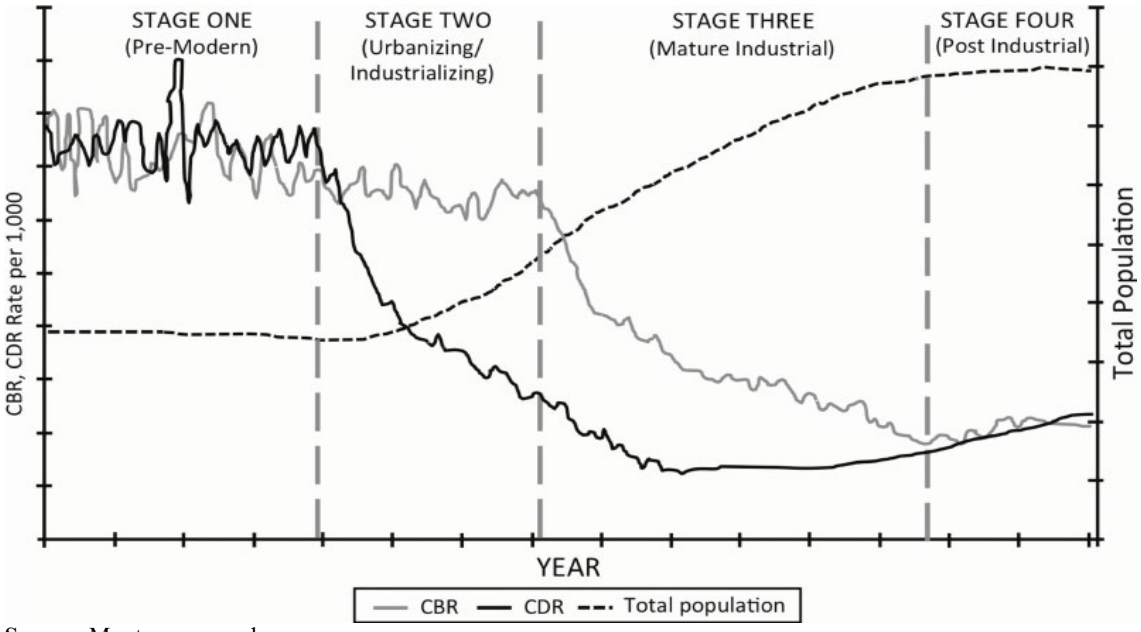
3.1. Theoretical Perspectives for Understanding Fertility and Childbearing Behavior

Theories are fundamental to understand the existing body of knowledge and phenomena. With the high births and high death rates occurring in many pre transitional societies, rapid population growth was a common phenomenon in most countries. The transition from high to low fertility first occurred in the developed world at high levels of socio-economic development. Afterwards, various theories were formulated explaining the key driving forces of fertility decline. Those theories which are related to fertility and childbearing present a systematic way to understand the variety of behavioral patterns of childbearing found across the world. The primary purpose of the present chapter is to review the major theories related to fertility and childbearing behavior including demographic transition theory (DTT), wealth flows theory of fertility decline, rational choice theory, theory of planned behavior (TPB), diffusion of innovations theory, life history theory, Easterlin model of fertility and the proximate determinants of fertility. Accordingly, this section examines how a number of theories have been applied to explain the fertility and childbearing behavior.

3.1.1. Demographic Transition Theory (DTT)

The Demographic Transition Theory (DTT), developed by Notestein (1945) is a comprehensive description of the transition from high birth and death rates to low birth and death rates as countries develop from pre-industrial to industrialized economies. The term fertility transition is a part of the broader theory of demographic transition. According to the theory, all countries pass through four stages during the transition as shown in the following figure.

Figure 3.1: Stages of Demographic Transition



Source: Montgomery, n.d.

In stage one, both crude death rate (CDR) and crude birth rate (CBR) were significantly high. Higher death rates were mostly caused by infectious diseases and natural disasters. Consequently, rapid population growth was naturally controlled. As a result of the agricultural revolution and improvements in public health inventions (Montgomery, n.d.), stage two leads to a fall in death rates while the birth rate remains constantly high, leading to a rapid population growth. In stage three, the birth rate also starts to decline as a response to a declining death rate. Population continues to grow, but at a slower rate. Stage four is characterized by a decline in both birth and death rates. The population growth rate is stabilized at zero or near zero population growth proving that the rapid population growth is a temporary phenomenon. With this lowest low fertility and various social and structural changes observed in the late 1960s in Western and Northern Europe, Lesthaeghe and Dirk van de Kaa (1986) developed a hypothesis of "Second demographic transition". The main distinction of the new hypothesis from the first DTT is the "overwhelming preoccupation with self-fulfillment, personal freedom of choice, personal development and lifestyle, and emancipation, as reflected in family formation, attitudes towards fertility regulation and the motivation for parenthood" (Van de Kaa, 1996; 425).

Given the above, DTT describes how fertility declines over time and the major driving factors. However, the theory itself is unable to accurately predict all the responsible factors, the timing and pace of fertility transition. It is an idealized pattern, and the actual figures do not follow or vary widely in terms of its speed and the volume of the transition. As shown by Hirschman (1994), "The vast body of empirical evidence on the origins, speed, and correlates of fertility declines in different historical and geographical settings shows more diversity than a simple theory of fertility change would predict". Therefore, several theories have attempted to fill the theoretical gap.

3.1.2. Wealth Flows Theory of Fertility Decline

Wealth flows theory describes how a reversed flow of intergenerational wealth between parents and children would change the fertility level in a society. According to his wealth flows theory of fertility decline, Caldwell (1982) states that human reproductive behavior is economically rational. In traditional agrarian societies, children were considered as essential workers and economic assets. Children made essential contributions to the family economy over their lifetime by providing unpaid labor at the lowest cost. Wealth flows from children to parents unconditionally while each extra child increases net wealth to parents. As long as the direction of this flow continues parents undoubtedly wish to have as many children as possible.

Caldwell (1982) argues that the reversal in the direction of intergenerational transfers of wealth within the family is associated with mass education. In the latter period, most countries introduced universal compulsory education for children while imposing bans on child labor. In industrialized societies, the traditional agricultural economy was no longer important. Thus, reversing the direction of intergenerational wealth flows, parents had to invest in their children's education. Likewise, parents had to spend more as it took longer for their children to enter the labor market. Having more children increased the parental burden significantly. This is the time when parents seek available reproductive options. People acquired the knowledge of how western parents limited their families and how big families became less prevalent. Thus, emphasizing the role of education in influencing reproductive behavior, Caldwell argues that education reduces

the number of children that women want by making women aware of the available reproductive options and permits a re-thinking of traditional cultural values.

3.1.3. Rational Choice Theory

Rational choice theory, also known as choice theory, is a framework for describing human decision making behavior based on preferences and rational choices. Levin and Milgrom (2004), define rational choice as a process of determining what options are available and choosing the most preferred option according to some consistent criterion. Therefore, the model is already an optimization-based approach. Though the theory is formed to describe social and economic behaviors, it can be applied to explain different disciplines including human childbearing behavior. Accordingly, childbearing behavior is performed as a rational choice based on each individual's self-interest. Having considered individual preferences and available reproductive options, people behave in a way that optimizes personal satisfaction. Thus, the logic of the theory could be used to predict the childbearing outcomes. In this respect, Becker's economic theory of fertility which emphasizes the applications of the economic approach to explain human behavior can be introduced as a good example of the rational choice theory (Becker, 1976).

Despite the importance of the theory in explaining rational based human behaviors, the theory has been criticized for a number of different reasons. A major criticism is that real-world choices often appear to be highly situational or context-dependent. The way in which a choice is posed, the social context of the decision, the emotional state of the decision-maker, the addition of seemingly extraneous items to the choice set, and a host of other environmental factors appear more likely to influence choice behavior. Moreover, the theory assumes that preferences are relatively stable and not situationally dependent. But preferences may vary largely if preferences are highly sensitive to context (Levin and Milgrom, 2004). Likewise, explaining individual behavior is not the primary task of sociology. Instead, a sociologist needs to analyze the influences of population structures on social life (Blau, 1997).

3.1.4. Theory of Planned Behavior (TPB)

The theory of planned behavior proposed by Ajzen (1985) is an extension of the theory of reasoned action. The TPB shows how social-psychological processes are involved in determining fertility intentions. According to the theory, having a child is a reasoned action. Conversely, an unintended birth is an outcome of a failed intention of not to have a child. The TPB suggests that attitudes, subjective norms, and perceived behavioral control affect intention, and that intention, with or without perceived behavioral control, leads to actual childbearing behavior (Ajzen, 1991).

TPB presents three conceptually independent determinants of fertility intention. The first is attitudes towards the behavior, which means the degree to which a person has a favorable or unfavorable evaluation or appraisal regarding the consequences of having a child. Second, there is a subjective norm, which refers to the perceived social pressure to perform or not to perform the behavior. Thirdly, a perceived behavioral control, which implies the perceived ease or difficulty of performing the behavior. The relative importance of the above three determinants in the prediction of intention is expected to vary across behaviors and situations. Thus, TPB provides an effective framework to incorporate the complexities of human social behavior.

3.1.5. Diffusion of Innovations Theory

The diffusion of innovations theory suggests that people learn and imitate nearby people's fertility behavior independent of socio-economic context (Casterline, 2001). The fundamental aspects of the diffusion of innovations theory are knowledge (scientific knowledge on contraceptive methods), attitudes (positive attitudes towards effective use of contraceptive methods) and innovations (innovative contraceptive technologies and behaviors). Accordingly, fertility decline is a result of the diffusion of various norms and ideals related to childbearing.

Following the industrial revolution, social changes were accelerated in the western world. With the rise of modern methods of communication, western influence expanded throughout the world making people aware of the effective ways of controlling fertility. Further, most countries integrated family planning programs into their population policies and a number of contraceptive

methods were readily available and easily accessible even in rural areas. Women's attitudes on the benefits of contraceptives became more important in overcoming negative beliefs and attitudes towards family planning. According to the diffusion of innovations theory, regardless of the economic development, such attitudinal changes had a great impact on fertility decline throughout the world.

Though the diffusion of contraceptive knowledge and ideals are seen as the significant motivators of fertility limitation, the magnitude and the timing of the decline vary largely between countries. Populations who open to outside influence would consciously start fertility limiting behaviors first. Moreover, effective government family planning programs with effective service delivery would help to bring about significant fertility decline. However, there may be ethnic, language, cultural and education related diffusion barriers that inhibit or discourage women from using contraceptive methods. Depending on changing attitudes and behaviors, major fertility differentials may arise in most transitional societies. For instance, urban women initiate fertility limiting behaviors earlier than rural women. Thus, diffusion theory attempts to fill the theoretical gap by integrating the contribution of social interactions on fertility decline.

3.1.6. Life History Theory

Life history theory, which was developed in the 1950s, attempts to understand variation in the reproductive strategies adopted by different life forms. Though the theory mainly depends on principles of evolutionary biology and ecology, it provides a foundation to explain human reproductive behavior when demographic theories related to reproductive behavior are lacking. The theory mainly describes how specific developmental periods require organisms to differentially allocate limited resources to navigate various aspects of survival and reproduction (Sacco & Osipowicz, 2012).

The fundamental concept of life history theory is that observed life histories are constrained by a combination of finite resource budgets and the 'Principle of Allocation', that is, resources (time, energy, effort) allocated to one function cannot be allocated to another (Cody, 1966). Thus,

natural selection cannot simultaneously optimize individual life history traits in isolation, but instead must optimize realizable trade-offs between competing dimensions of an organism's life history. Life history theory has provided new perspectives in understanding many aspects of human childbearing behavior, such as the association between current reproduction and future success, poverty and fertility, quantity vs quality of offspring, and age at first birth and longevity, etc.

3.1.7. Easterlin Model of Fertility

In demographic literature, micro economic theories of fertility have been explained through different perspectives of consumer behavior. The Easterlin model of fertility, also known as Easterlin theory of supply-demand (1978) is an extension of the new household production model. Easterlin assumes that demand for children is mainly determined by optimization behaviour. Hence, during the fertility transition, couple's 'rational choice' has become more important as predicted by Becker's new household economics model. Becker shows that the supply of children is largely influenced by social and familial, as well as biological conditions. As a result, the situation in periods before the fertility transition is likely to have been that of excess-demand. Consequently, prior to the onset of fertility transition fertility tended to rise, rather than an outright decrease of the birth rate. These arguments underline the importance of the pre-transition rise in fertility when delineating a long-run, historical processes that change fertility patterns.

While accepting the basics of micro-economic theory, Easterlin claims that basic assumptions relating income, taste and prices to the demand of children are insufficient. According to the Easterlin model of fertility, young couples first try to achieve a similar or better living standard compared to their parents. If a couple can achieve their expected living standard easily, they will marry early. On the other hand, when jobs are scarce couples have to wait to get married and have fewer children. According to the theory, the number of children will be decided upon the couple's potential to have children, preference for children, income of the household, the expenditure per child and the cost of fertility regulation. The theory suggests that modernization can lead first to

a rise and then to a fall in fertility due to less breastfeeding, reduced sterility and early marriages, etc.

However, the Easterlin model of fertility does not closely assume fertility behaviors in developing countries. Despite the relatively low income levels, most families report higher fertility levels in most developing regions. On the contrary, the theory explains drivers for marriage and subsequent fertility, yet the theory does not explain the variations in pre-transitional marital fertility.

3.1.8. The Proximate Determinants of Fertility

Davis and Blake (1956) first introduced the concept of "intermediate fertility variables" or biosocial determinants with 11 factors, which include direct and indirect variables affecting fertility. Unlike indirect determinants (socio-economic, cultural and environmental factors, etc.), intermediate fertility variables have a direct influence on fertility. Further developing the above concept, Bonagaarts (1978) identified the most significant eight proximate determinants under three broad categories as follows.

I Exposure factors

1. Proportion married: The proportion of women of childbearing age that engages in sexual intercourse regularly. The term "marriage" is used to refer to all sexual unions.

II Deliberate marital fertility control factors

2. Contraception: Any deliberate practice, method or device which prevents conception.
3. Induced abortion: A deliberate action of terminating a pregnancy

III Natural marital fertility factors

4. Lactational infecundability/amenorrhea: A temporary postnatal infertile period of a mother due to fully breastfeeding. Following childbirth, most women remain infecundable until regular menstruation returns.
5. Frequency of intercourse: The frequency of how often couples have sex including those due to temporary separation or illness.

6. Sterility: Physiological inability to reproduce due to a cause other than contraceptive sterilization.
7. Spontaneous intrauterine mortality: A fetal death any time during pregnancy due to a spontaneous abortion or a still birth
8. Duration of the fertile period: Fertile period includes the days a woman is most likely to get pregnant, usually two or three days in the middle of the menstrual cycle when ovulation takes place.

Bongaarts defines the above proximate determinants of fertility as the biological and behavioral factors through which social, economic and environmental variables affect fertility. Moreover, Bongaarts and Potter (1983) revealed that about 96 percent of the variance in the total fertility rates could be explained by the four proximate determinants of proportion married, use of contraception, postpartum infecundability and induced abortions, while social, economic and environmental variables also affect fertility through the above proximate determinants.

3.2. Summary

As described so far, no single theory has been able to readily summarize all the possible driving factors of fertility transition. Even DTT itself is unable to describe all the sets of factors that contribute to the fertility transition, particularly in developing regions. Based on the theoretical approaches discussed in the present chapter, demographic, socio-economic, fertility intention related and contextual factors could be identified as the major driving factors of childbearing behavior. However, the effect of cultural factors has not been integrated to the above theories. Hence, the next chapter is devoted to supplement the existing knowledge in the field of childbearing and fertility with insights drawn from empirical studies.

CHAPTER FOUR

EMPIRICAL LITERATURE ON CHILDBEARING: A LITERATURE REVIEW

4.1. Introduction

This chapter reviews both local and international scholarly articles which discuss factors associated with childbearing including demographic, cultural, female autonomy related and contextual factors. Finally, fertility intention related factors, regional variations in childbearing and the role of midwifery care are discussed. Accordingly, this chapter describes factors influencing the childbearing practices focusing on empirical studies, while applying them into Sri Lankan context. By reviewing the related literature, this chapter provides an overview of the existing knowledge in the field. Assessing the significance and the contribution of the current study to the broad body of literature, the chapter identifies research gaps while showing how the present study deviates from previous studies. The chapter ends by outlining the conceptual framework of the study.

4.2. Demographic Factors Associated with Childbearing

Childbearing behavioral patterns can be observed during the childbearing years of a woman. The Population Reference Bureau (n.d.) defined 'childbearing years' as the reproductive age span of women, 15-44 or 15-49 years of age. Thus, every woman has a biological capacity for reproduction. Leridon (1977) states that in modern populations the average age of menopause seems to be 48 to 50 years and the total length of reproductive life could be longer than 35 years. However, most women in contemporary societies stop childbearing much earlier than the age at menopause (Singh et al., 2012; Marcil-Gratton, 1988; Hardy et al., 1996; Henshaw and Singh 1986; Curtis et al., 2006) while people in traditional societies experience natural fertility, which means fertility in the absence of any form of family limitation.

Compared to a natural fertility society, when family limitation is practiced, couples generally terminate childbearing at the earlier part of the woman's reproductive span. This has implications for both the age of mothers at their last birth and the shape of the age schedule of childbearing

(Knodel, 1987). As a result of deliberate fertility control, the age of mother at last birth is lower in controlled fertility societies relative to natural fertility societies (Knodel, 1987; Coale and Trusselle, 1974, 1978: Tolany and Guest, 1984; Wrigley, 1966).

In many Asian societies, age at first birth is closely related to the age at first marriage. Women who marry early have, on average a lower age at first birth (Rindfuss et al., 1983; Chowdhury et al., 2017). Due to the significance of age at marriage in explaining fertility variations across populations, many scholars have stated that the age at first marriage has a direct bearing on fertility behavior (Davis and Blake, 1956; Lesthaeghe et al., 1989).

Existing literature revealed that rapid social change in marriage patterns towards consensual unions (Huijgen, 2010; Caldwell et al., 1989; De Silva, 2000), higher education attainments (Ikamari, 2005; Kim, 2016; Population Reference Bureau, 2007; Caldwell et al., 1989) labor force participation (Solanke, 2015; Kim, 2016; Caldwell et al., 1989) and the necessity of becoming economically independent (Huijgen, 2010; Kim, 2016; De silva, 2000) are the most common contributing factors for delaying women's age at first marriage. Though there has been occasional faltering, all the countries in Asia show a continuing shift to later female age at marriage in a remarkably uniform manner. "Sri Lanka, as in so many other features, is the exception among South Asian countries, with a much later age at marriage at the beginning of the century and a SMAM in 1981 much older than elsewhere in South Asia" (Xenos and Gultiano, 1992: 10).

Kirk (1969) introduced Sri Lanka as an interesting case, a sort of Ireland in Asia, in which late marriage has reduced fertility. De Silva (2000) introduces two correlates of marital postponement in Sri Lanka. First, there is a marriage squeeze, which refers to an imbalance of males and females. In the Sri Lankan context, the marriage squeeze is associated with the shortage of men due to higher male death rates (war and malaria) and labor migration. Second, there is socio-economic and cultural change, which include education, employment opportunities, weakening of the economic performance and change in marriage patterns. In particular, the enrollment in an educational institute can delay the age at marriage in Sri Lanka significantly as

girls are not likely to marry while they are studying. Even after the completion of education, the high unemployment rate among well-educated youth delays the age at marriage. Furthermore, unlike traditional societies where marriages are often arranged between families, most marriages are now based on individual selection. As a result, both men and women take a considerable time to achieve the standards for a marriage (De Silva, 2000).

4.3. Cultural Factors Associated with Childbearing

The influence of cultural factors on childbearing behaviors has widely been discussed. This section pays attention to religion and ethnicity as the major cultural factors affecting childbearing.

Numerous studies have stated that religion plays an important role in shaping the childbearing behavior of women (Wijesinghe and Siddhisena, 2017; Sarker, 2010; Rabbi and Kabir, 2013). Accordingly, several studies have found that religion plays a key role in fertility decision making (Sarker, 2010; Rabbi and Kabir, 2013). Adhikari (2010) claims that Muslim women were more likely to have a higher number of CEB compared to their counterparts. Likewise, Chandrasekhar (2010) shows that Muslim women in India are more likely to have their first birth at earlier age than Hindu women. On the other hand, Christians and women in other religious groups are less likely to have their first birth at earlier ages than the Hindu Women.

Assessing the ethnic aspect of fertility in Sri Lanka, Abeykoon (2001) emphasized that fertility has been decreased among different ethnic groups in Sri Lanka. His findings suggest a rapid decline in fertility among Sinhalese and Sri Lankan Tamils compared to Indian Tamils and Moor populations. Additionally, in his earlier study, Abeykoon (1987) mentioned that during the period of the 1980s, the level of education of Sri Lankan women had a negative influence on fertility considering all ethnic groups. Age at marriage also had strong negative effects on fertility irrespective of the ethnic group, while the effect was most marked among Sri Lankan Tamils. His findings further suggest that socio-economic assimilation, with the associated higher levels of education, will facilitate more modern behaviors such as delaying age at marriage and increased use of effective contraception among ethnic minorities in Sri Lanka.

Emphasizing the significance of ethnicity and religion, Wijesinghe and Siddhisena (2017) point out that Muslim women tend to have their last birth at ages significantly older than the Tamil women as Muslim women have attitudes towards large families, some restrictions to control births and different religious norms.

4.4. Female Autonomy Related Factors

Female autonomy, the capacity to manipulate one's personal environment is considered as associated with demographic behaviors of a country. Autonomy indicates the technical, social, and psychological ability to obtain information and to use it as the basis for making decisions about one's private concerns and those of one's intimates. Thus, equal sharing of autonomy between the sexes in the present sense implies equal decision-making ability with regard to personal affairs (Dyson and Moore, 1983). Women's autonomy in health-care decision-making is extremely important in a range of health care situations, from health care seeking and utilization to choosing among treatment options (Osamor and Grady, 2016). Therefore, a large and growing body of literature has investigated the association between women's autonomy, decision making power and demographic success. A number of studies have argued that high female autonomy is closely associated with relatively favorable demographic performance and vice versa (Dyson and Moore, 1983; Sougou et al., 2020).

Dyson and Moore (1983) demonstrated how northern and southern demographic regimes of India are shaped by kinship, family system and female autonomy. Esteem, decision making ability, freedom of movement, postnatal residence patterns, behavioral norms, the ability of females to inherit, sexual and marital relationships and postmarital relationships between females and their two sets of kin are considered in assessing relative female autonomy. They argue that northern kinship is associated with low female autonomy while southern kinship is associated with high female autonomy. Accordingly, due to the patriarchal kinship system in the northern area, arranged early marriages are more common. Particularly, high marriage cost with increasing age of women forced women to marry early. Following the marriage, women start childbearing

immediately due to the strong pronatalist pressure within marriage, patriarchal residence, discouraging the establishment of strong husband-wife bonds, restrictions on family planning, son preference and sexual violence. On the contrary, they suggest that due to the structure of family authority and freedom under southern kinship, which offer women a better position, southern women are more autonomous.

Women's autonomy is likely to be associated with the age of the mother, residence, household monthly income, women's education level and women's employment status, etc. (Nigatu et al., 2014). Among these factors, the association between education and female autonomy has widely been discussed (Gabrysch et al., 2016; Nigatu et al., 2014; Dyson and Moore, 1983; Acharya et al., 2010). Solanke (2015; 8) argued that "women who delay marriage till older ages will have higher empowerment because in most cases most of the women delaying marriage were mostly attending educational institutions or actively engaged in the labor force". Further, Jejeebhoy (1995) has suggested that women's autonomy may be a key pathway through which education influences fertility.

Numerous studies have attempted to explain the relationship between women's level of education and fertility. It has been suggested that well educated women are more likely to postpone having children than less educated women (Kim, 2016; Mills et al., 2011; Solanke, 2015; Heaton et al., 1999; Schoen et al., 1999; Broeck and Maertens, 2014). Moreover, previous studies have reported that higher education leads more women to delay their first birth (Gustafsson and Wetzels, 2000; Amuedo–Dorantes and Kimmel, 2004; Robbi and Kabir, 2013; Ida and Albert, 2015; Mugarura, 2016; Marphatia et al., 2019).

In the Sri Lankan context, Dissanayake (1996) examines the relative impact of starting, spacing and stopping fertility behavior on the onset of fertility transition and the subsequent fertility decline in Sri Lanka. The findings of his study show that well educated women, who obtained the benefits of mass education, contributed significantly to the change in fertility level in the country. The decline in age at last birth contributed to the change in fertility most, while

age at marriage and birth spacing patterns were also significant in explaining changes in completed fertility within the educational sub-groups. Thus, he suggests that the improvement of female education has a substantial effect on the onset of fertility transition, even in the absence of a strongly organized national family planning program in Sri Lanka during the decade of the 1960s (Dissanyake, 1996). Moreover, Abeykoon (1987) has revealed that during the period of the 1980s, the level of education of Sri Lankan women had a negative influence on fertility.

In their descriptive study, Wijesinghe and Siddhisena (2017) suggest that women with more years of schooling have grater probability of bearing a first child at older ages than women with less education. The partner's education was also found to be important whereby as the husband's education increased by one year, the risk of having the first child at an early age decreased by 2.7 percent. Further, the authors have assessed the economic and social determinants of fertility stopping behaviors in Lanka. Accordingly, they suggest a number of differentials of fertility stopping behavior. Women with more years of schooling have a greater probability of ending childbearing older than women with less education. Most educated women postpone their marriage for education and employment purposes, and therefore the postponement of marriage leads to delaying the first birth as well as the age at last birth.

In the same way, the mothers' employment status is also related with childbearing. Working at home or outside before marriage is a strong factor in postponing the first birth (Chowdhury et al., 2017; Wijesinghe and Siddhisena, 2017). From an economic point of view, the optimal women's age at first birth is determined as a result of a plan for investment in human capital and labor market activities (Cigno and Ermish, 1989; Cigno, 1991; Gustafsson and Wetzels, 2000; Gustafsson, 2001). These statements reflect the fact that delay in first birth enhances the economic capacity of women through increased labor force participation.

Wijesinghe and Siddhisena (2017) show that employed women want to end their reproductive career earlier than unemployed women as they wish to return to the labor market immediately. Further, they revealed that there is a negative relationship between the women's age at first birth

and labor force participation in Sri Lanka. The authors revealed that the risk of having a first child at early ages with employed women is 9 percent lower than unemployed women.

The association between childbearing and women's wealth has also been examined by Wijesinghe and Siddhisena (2017). They have confirmed that the women in the richest category tend to have their first child at an older age than the poorest women. On the other hand, they point out that the women in all other wealth categories had their last birth at an earlier age than women in the poorest category, implying that the wealthy families have more opportunities to access various contraceptive methods and to end childbearing at an early age. This suggests that compared to wealthy women, childbearing years are relatively longer among poor women.

As described, level of education, labor force participation and economic status are closely associated with female autonomy. In particular, participation in high education make women more autonomous by providing better employment opportunities, good income, and autonomy over marriage and fertility decision. Accordingly, women's education plays a major role to increase female autonomy.

4.5. Contextual Factors

Contextual factors can be simply defined as factors which reflect a particular context, characteristics unique to a particular group or community. In the literature, culture, religion, residence, neigborhood and different socio-economic contexts have widely been discussed as context (Ghimire, 2017; Axinn and Fricke, 1996; Bongaarts and Watkins, 1996). Durkheim (2014) shows that individual preferences and behaviors are shaped, and even controlled, by social context primarily through the "moral power" of the society. A number of studies suggest a significant impact of social context on individuals' childbearing attitudes and behaviors (Ghimire, 2017; Bongaarts and Watkins, 1996; McNicoll, 1980). According to Axinn and Fricke (1996) and Entwisle et al. (1989), immediate social and geophysical characteristics of the community exert a particularly strong influence on individual behavior in most rural settings.

Among numerous contextual factors, sector of residence is an important factor which reflects the important aspect of the level of development and services in an area. Depending on the development level of the area, contextual factors may be most to least influential over childbearing behaviors and intentions. Therefore, the current study examines contextual factors based on sector of residence.

Adhikari (2010) argues that women who resided in rural areas have a higher number of children ever born than their urban counterparts in Nepal. He suggests that urban women are more likely to use contraceptives while rural women tend to marry at a younger age. As a result, the fertility levels in urban and rural areas tend to be different in line with diffusion theory predictions.

Other than the urban and rural sectors, Sri Lanka constitute of the estate sector, which is economically based on plantations. Sri Lanka's vast tea sector, comprised of nearly 450 plantations spread across the country (D'Almeida, 2020). Low caste, Tamil-speaking poor communities were brought to Ceylon from South India as laborers in the early 1800s by British rulers (Moldrich 1989; Peebles 2001). However, as an ethnic minority with poor socio economic background, they continue to experience landlessness, uneven access to higher education, healthcare and government services (Gunetilleke et al., 2008; Balasundaram, 2009).

Sectoral variations in fertility have been observed in Sri Lanka wherein the estate sector has the highest TFR (2.5), followed by rural (2.3) and urban sectors (2.2) (Department of Census and Statistics, 2009). Suggesting a significant variation in fertility among sectors, Perera (2017) also shows that women who lived in rural and estate sectors were 1.4 and 1.2 times, respectively, more likely to prefer more children compared with urban women. Further, Wijesinghe and Siddhisena (2017) state that the women who live in the estate sector tend to end childbearing at an early age compared to women in the urban sector.

Estate sector has long had high prevalence of female sterilization compared to urban and rural sectors. Estate sector had the highest prevalence of female sterilizations, at 39.9 percent, while the urban and rural sectors stood at 13 and 15.5 percent respectively (Department of Census and

Statistics, 2009). By 2016, prevalence of female sterilization in the estate sector dropped to 27.4 percent, but still remained well above the rural and urban sectors, at 13.9 and 11.2 respectively (Department of Census and Statistics, 2017). Thus, estate women who completed their desired number of family size tend to use permanent contraception rather than traditional and other modern contraceptives.

4.6. Fertility Intention Related Factors

Intentions, by definition, imply foresight and a weighing, perhaps implicitly, of alternative choices (Morgan and Rackin, 2010). As indicated by Philipov (2011), demographers analyze fertility intentions mainly for two reasons. First, at the macro-level, to gain a better understanding of fertility behavior and to improve the accuracy of fertility predictions. Second, with the use of micro-level data and methods, demographers aim to explore the factors influencing the fertility intentions and subsequent realization or frustration of intentions. To clarify, fertility intentions imply a wide range of individual actions towards childbearing including, intentions to get marry, positive and negative motivations to have a/another child, choosing contraceptives to space and limit pregnancies, using induced abortions and ideal number of children etc.

Based on social and behavioral sciences, Miller (1994) conceptualizes a framework presenting the reasons that humans become motivated to bear children including a four-step psychological sequence: the formation of traits, the activation of traits into desires, the translation of desires into intentions, and the implementation of intentions in the form of behavior. Accordingly, this approach indicates how childbearing motivational traits lead to childbearing desires and how the latter lead to childbearing intentions. Data from 401 married couples were used to test how childbearing motivational traits lead to childbearing desires and how the latter lead to childbearing intentions. Miller's findings suggest that both positive and negative childbearing motivations are the primary determinants of childbearing desires, and childbearing desires are the primary determinants of childbearing intentions.

Prior to the diffusion of scientific knowledge on conception and contraception, childbearing was merely dependent on biological factors. Yet, in modern societies, where couples use family limitation strategies even prior to the first birth, natural fertility has become only a hypothetical phenomenon. However, due to the effective contraceptive practices in transitional societies, it became important to compare actual fertility and the natural fertility (Henry, 1977).

Spacing is dominated by the knowledge and access to contraceptives. Hence, spacing behavior has become more important in the transitional societies. According to Okun (1995), spacing behavior is an approach to reduce the family size. It is a continuous decision-making exercise concerning fertility control in response to current social, economic and demographic conditions (Anderton, 1989). As introduced by Knodel (1987), family limitation has generally been divided into two approaches: parity-specific control (an aim for a specific number of children after which subsequent births are avoided) and parity independent control (birth spacing independent of parity). By any means, the earlier the age at which childbearing commences, the longer the average interval is likely to be within any given category of final number of confinements.

Edmeades et al. (2012) have ascertained the attitudes towards controlling fertility and family size. According to their findings, sex composition has no significant effect on the use of temporary contraception and very few modern temporary method users were reported. Even though abortion related information is more likely to be under reported, Edmeades et al. (2012) found that couples who achieved their preferred sex composition were twice as likely to attempt abortion while such couples were twelve times more likely to be sterilized relative to those with two girls only.

Contraceptive use in Sri Lanka has presented several unique characteristics. The World Health Organization (WHO) pointed out that unlike most of the other countries in the region, contraceptive use by women in Sri Lanka is relatively more prevalent among rural women (70%) compared to women living in estate areas (64%) (WHO, n.d). As a result, rural fertility in Sri Lanka has declined at a faster rate during the past decade, and in 2000, it was lower than urban

fertility (Abeykoon, 2006). Caldwell et al. (1987) also stated that the observed usage patterns of contraceptive use in Sri Lanka were unique and unusual. Most educated urban women tend to practice traditional contraceptive methods instead of modern methods. In particular, traditional methods were most likely to be used by Buddhists and least likely to use by Muslims.

Numerous studies have suggested that predictions based on fertility intentions are not far from actual fertility (Liefbroer, 2009: Morgan and Rackin, 2010; Bumpass and Westoff, 1969; Edmeades et al., 2012; De Silva, 1991) whereas "desire for additional children" and "ideal family size" predicts subsequent fertility with a fair amount of consistency (Freedman et al., 1975; Hermalin et al., 1979; Rodgers, 1976; Westoff et al., 1957; Bumpass and Westoff, 1969). In the 1930s, the mean intended family size in a sample of about 300 U.S. couples was 2.7. Twenty years later, the actual family size was 2.6 (Westoff et al., 1957). In a later study (Bumpass and Westoff, 1969), the mean desired family size among couples with 2 children was 3.3, and the actual completed family size was also 3.3. Moreover, women in low-fertility countries have far fewer children than intended (Beaujouan and Berghammer, 2019; Morgan and Rackin, 2010). However, fertility intentions and attempts to realize them are highly constrained because of sub fecundity or infecundity, structural obstacles (e.g., difficulty finding a spouse or full employment), and social norms (Morgan and Rackin, 2010).

The ideal family size may vary due to high infant and child mortality within the family, kin group, neighborhood or state. On the contrary, parents may practice infanticide due to strong preferences for sons or daughters in different parities. India has shown skewed sex ratios for decades, implying the prevalence of a strong son preference. Parents in India have strong economic and social incentives to prefer sons over daughters, including important religious roles that only sons can perform, land inheritance to sons, sons' role in old age support of parents, and perpetuation of the family name (Calhoun et al., 2013). Arnold et al. (1998) also introduces three dimensions of son preference, such as economic utility, social utility, and religious utility.

However, unlike other South Asian countries, there is no evidence in the Sri Lankan context that gender preference is important in explaining childbearing behaviors.

As reflected in 1987 and 1993 SLDHSs, there was a high motivation among married couples to control fertility. The intended fertility level was always lower than their achieved fertility. The SLDHS 1987 showed that the intended fertility level was 2.2 while the achieved fertility level was 2.6. Even in 1993, the achieved fertility level was 2.3 whilst the intended fertility level was 2.1 (Siddhisena, 2000). Thus, the fertility intentions of women in Sri Lanka remained at or near the replacement level even three decades ago. Depending on these low intended fertility levels, many researchers have emphasized that the women in Sri Lanka will further limit the number of children in a family and further decline in fertility can be expected in this century (Siddhisena, 2000).

4.7. Regional Variations in Childbearing

Regional variations in fertility have been identified within various Asian countries. Among them, the great majority of South Asian studies are from neighboring India where most have emphasized the persistence and significance of regional fertility differentials in India due to urbanization and development level, education achievements and availability of contraceptives, etc. (Guilmoto and Rajan, 2013; Spoonberg and Dommaraju, 2012; Som and Mishra, 2017).

Suggesting a high regional diversity, Guilmoto and Rajan (2013) have shown that fertility went down below the replacement level of 2.1 in 174 districts out of 621 districts by 2011. Even so, considering the national level alone, they have demonstrated that fertility transition in India was slower than the pace observed elsewhere in Asia. Spoonberg and Dommaraju (2012) confirmed the persistence of regional fertility differences in India, beginning with the transition to the third birth. Their findings revealed that less than 40 percent of women with two previous births continue on to have a third birth in the South, while more than 70 percent of women did so in the Central region. Correspondingly, Som and Mishra (2017) suggested that fertility in India

represents sharp contrasts between regions. The authors have pointed out some spatial patterns of fertility by showing the lowest TFR in West Bengal and its southern and eastern districts.

Several studies have confirmed the prevalence of regional variations in Bangladesh by examining the contribution of proximate determinants of fertility variables (Islam et al., 2003; Kabir et al., 2009). Wang and Chi (2017) have suggested that spatial variation of TFRs in China is caused by differences in socio-economic development, fertility policy, cultural contexts and norms. Recently, there has been an increasing amount of literature on the negative relationship between fertility and population density (Lutz and Qiang, 2002; Lutz et al., 2006; Croix and Gobbi, 2016; Croix & Gobbi, 2017; Kato, 2018). Further, Kawabe (1979) discusses how regional differences appeared in Japan during the period 1925 to 1960. The findings of this study showed that regional differentials in Japan become smaller during 1930 to 1950. This suggests that regional convergence of fertility may be a phenomenon which can be observed later in the transition.

Regional studies of fertility are crucial to explore similar fertility regimes in different countries. For instance, Sri Lanka and Kerala (a state in the southern part of India) have frequently been described as regions which represent similar demographic regimes (Dyson and Moore, 1983; Caldwell, 1996; Sathar and Phillips, 2001; Dyson, 2001) while fertility regimes of India and Sri Lanka represent huge variations. As pointed out by Dyson (2001), Sri Lanka and Kerala are the most advanced populations in South Asia. In this respect, many of the details of Kerala's birth and death rates trends since the 1930s have been similar to those in Sri Lanka. Moreover, both populations have experienced some stall in CBR decline.

Available limited studies relating to regional fertility in Sri Lanka convey a wide variation in marital fertility (Gajanayake, 1984) and contraceptive practice (Yapa and Siddhisena, 1998) across districts in Sri Lanka. The vast majority (96%) of the variance in the TFRs could be explained by the four proximate determinants, whereas social, economic and environmental variables also affect fertility through the proximate determinants (Bongaarts and Potter, 1983).

Additionally, ethnic-religious composition, cultural factors, economic development, level of urbanization, population density, and various individual characteristics of district population may have an impact on regional variations in Sri Lanka. Especially, some ethnic and religious groups of Sri Lanka show influence from various dimensions of life even in marriage and childbearing behavior. For instance, the minimum legal age of marriage in Sri Lanka is 18 years for both men and women. Beyond that law, the marriage age for Muslims is governed by the Muslim Marriage and Divorce Act, allowing for a girl to marry as young as 12, without the permission of a Quazi court[2], or younger than the age of 12 with the Quazi courts' permission (Na'im, 2015).

4.8. The Role of Midwifery Care

Midwifery care has been established in various countries in order to improve maternal and child health standards. As defined by the WHO (2004), midwives are skilled birth attendants and their role includes health counselling and education for women, their families and the wider community (Nove et al., 2018). According to Bogren (2016), midwives are the key professionals in improving maternal and child health globally, but establishing a midwifery profession in low-income countries is proving to be difficult.

Butler et al. (2008) introduce safe service, right attitude and communication skills as the most important aspects of midwifery services. Lundgren and Dahlberg (2002), emphasize the importance of listening skills of midwives and allowing women the opportunity to participate in decision making. Further, the importance of establishing a relationship of trust in a professional way, importance of sensitivity to women's nonverbal communication and of being able to see the entire process of birth through with the woman are introduces as essential qualities of PHMs.

Halldorsdottir (2011) introduced a midwife's professionalism as a key factor in empowering women during the childbearing process.

"A good midwife is in many ways like a personal guide, who leads the woman and her family through the journey of the childbearing process and whose guidance is adapted to the needs of

[2] The Muslim Marriage and Divorce Act is administrated by the Quazi court system in Sri Lanka.

each woman and her family. The midwife utilizes all communications to empower the woman, for instance by providing information and the appropriate knowledge, with the objective of empowering the woman. The influence of the interaction with a good midwife is best described as empowerment" (Halldorsdottir, 2011: 811).

Thus, Halldorsdottir suggests that midwife strengthens a woman's confidence facilitating recognition of her own strengths and capacities.

Bogren (2016) explores the situation and building of a midwifery profession in South Asia and how influential actors are connected to one another in the building of midwifery profession, especially in Nepal and Bangladesh. Bogren's findings suggests that it was feasible to establish a midwifery profession separate from the nursing profession in Nepal. The actors' connections for the establishment of a midwifery profession in Nepal can be described with a complex set of facilitators for and barriers to promoting the establishment of a midwifery profession. A driving force for collaboration was that they had a common goal to work towards reducing the country's maternal and child mortality. On the other hand, in Bangladesh, the system actors for promoting the establishment of a midwifery profession connected through a common goal to reduce maternal and child mortality and morbidity. To achieve this goal, actors contributed their unique competence, which resulted in curriculum development and faculty development plans.

To date, numerous studies have been carried out on PHMs in Sri Lanka. Such studies have investigated the knowledge, attitudes and practices of PHMs in relation to immunization practices (Beneragama, 1991), knowledge and attitudes of PHMs on mosquito borne diseases (Palipane, 1997), performance of PHMs in postpartum care of the mother and the new born (Fernando, 1997) and challenges faced by PHMs (Balasuriya et al., 2008). More recently, Jayatilleke et al. (2015) attempted to evaluate the efficacy of a training program for PHMs focusing on violent intimate partners while Siriwardhana (2019) examined socio-economic inequality and determinants of postnatal home visits made by PHMs.

4.9. Research Gaps and Conceptual Framework of the Study

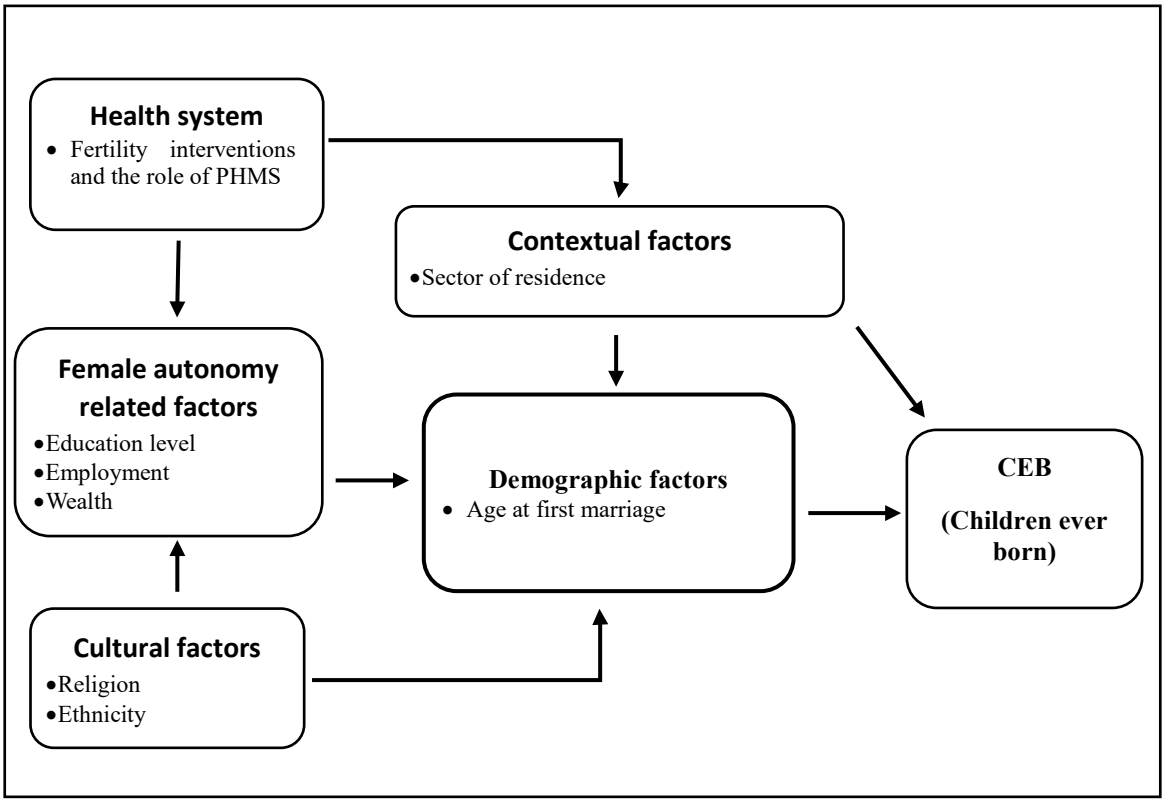
In view of the existing literature that has been mentioned so far, it is clear that there are significant variations among population subgroups regarding the fertility levels, and childbearing practices in Sri Lanka. Due to the recently observed unique characteristics of the Sri Lankan fertility transition, it is necessary to examine the recent fertility levels and trends, and childbearing patterns at the national and district level. However, according to the literature review, it is clear that childbearing patterns have not been properly investigated recently. Given the lack of critical attention paid to childbearing, there is a timely need to explore the current fertility levels and childbearing practices in Sri Lanka.

Although there are number of studies that have been conducted on PHMs by several authors for different purposes, to our knowledge, none of the prior studies have examined the role of midwifery care in childbearing in the Sri Lankan context. Therefore, the current study examines the role and perceptions of PHMs regarding the women's childbearing behavior based on the urban, rural and estate sectors in Sri Lanka. To clarify, the current study seeks to address the following issues on PHMs.

a) The role of PHMs in reproductive decision making and maternal and child health
b) PHMs' perceived fertility preferences
c) PHMs' perceptions of the contraceptive behavior of women
d) PHMs' perceived support from family members in childbearing and childcaring.

Thus, the current study attempts to contribute to a number of fields on childbearing and the role of PHMs on childbearing practices in Sri Lanka which has hither to been lacking in the existing literature. In order to fill these research gaps, this study has adopted the following operational framework which is built based on established theories, relevant empirical studies and research gaps discussed so far. To get a more complete picture of current fertility in Sri Lanka, the operational framework combines SLDHS quantitative data with qualitative interview data.

Figure 4.1. A conceptual framework for explaining CEB



According to the framework (figure 4.1), the factors affecting CEB are mainly classified into five groups including demographic, cultural, female autonomy related and contextual factors while health system also influences the number of CEB.

Demographic factor of age at first marriage is a direct determinant of the number of CEB. Marriage is seen as the major exposure factor of childbearing. Hence, it is acknowledged that women who marry at a younger ages tend to have more children compared to those who marry late.

Cultural aspects are vital in multi-ethnic and multi-religious societies in determining the number of CEB. It was hypothesized that majority Sinhalese Buddhist women are less likely to have more children compared to women in minor ethnoreligious groups.

Female autonomy is considered as a major factor deciding women's reproductive career. It was assumed that well educated women have greater autonomy as well as lower fertility. On the

other hand, it was predicted that less educated counterparts have lower autonomy and high fertility. Moreover, female employment and wealth are also considered as positively associated with female autonomy.

Contextual factors are also important in explaining CEB. Due to the relatively lower socio-economic backgrounds experienced in estate sector, it was assumed that women who live in estate sectors have higher numbers of children compared to urban and rural women.

Health system and fertility interventions at the local level are greatly associated with demographic achievements and childbearing patterns of a country. Accordingly, the role and interventions of midwifery care is assumed to be one of the major factors of demographic success in Sri Lanka. The role, services and interventions of PHMs are considered as different in urban, rural and estate sectors due to the socio-economic and other contextual factors of women.

CHAPTER FIVE

Data Sources and Methodology

5.1. Introduction

The current study employs a mixed methods approach for data collection and analysis as it is an ideal technique to analyze various aspects of childbearing as well as the role of PHMs. The study combines the quantitative data of SLDHS conducted in 2016 and the qualitative data of interview series with PHMs working in Sri Lanka. Hence, this chapter presents both qualitative and quantitative data sources, methods of data collection and analysis. In particular, the findings of the quantitative data are presented based on three levels of analysis: national, district and micro level while qualitative data are presented based on urban, rural and estate sectors in Sri Lanka.

5.2. Quantitative Data Sources (SLDHS 2016)

The micro data of SLDHS conducted in 2016 provides the quantitative data for most analysis of the current study. The SLDHS 2016 is the most recent and reliable national level data source which provides a wide range of demographic data particularly on childbearing. It is the fifth round in a series of national level surveys conducted in Sri Lanka since 1987. The survey was conducted by the Department of Census and Statistics with funds from the World Bank. Unlike earlier surveys, SLDHS 2016 included all 25 districts of the country while the Computer Assisted Personal Interview (CAPI) method was used for the first time in data collection procedures. The data includes information on maternal and child health, various childbearing related characteristics such as marriage, reproductive career, knowledge and use of contraceptive methods, breast feeding practices, fertility preferences, women's status, pregnancy and postnatal care etc.

In the regional analysis, district fertility levels were measured using TFR, the most widely accepted standard for comparing fertility levels across regions and countries over time. Due to insufficient data, previous studies found it difficult to compare district TFRs of Sri Lanka. However, the two most recent SLDHSs and population census (2012) provide district level TFRs

allowing us to conduct a reliable district fertility analysis. In order to provide a basic overview for the historical fertility transition in districts of Sri Lanka, district TFRs were calculated for 1971 and 1981 using the data of tables 3 and 4 from Gajanayake (1984)[3]. For this purpose, first, district ASFRs for the years 1971 and 1981 were calculated based on the number of births according to the age group of mothers and number of all women in each age group. Second, district TFRs were calculated by summing up the above-mentioned district ASFRs. Similarly, TFR for 2001 were calculated using unpublished data from the 2001 population census. Thus, other than the two major data sources, various secondary data sources were utilized in analyzing fertility levels and trends in districts of Sri Lanka.

5.2.1. Sample Design

The SLDHS 2016 used two-stage stratified sampling design, which was aimed at collecting detailed information from a nationally representative sample of all ever-married women and their children aged below 5 years. Initially, a total of 28,720 housing units were selected and out of them 27,210 housing units were included in the household survey. Within the households interviewed, a sample of 18,510 eligible (ever-married aged 10 to 49) women was selected and out of them 18,302 interviews were successfully completed with a high response rate of 98.9 percent.

At the first stage, 2500 census blocks were selected as primary sampling units (PSUs) based on the census blocks from the CPH 2012. At the second stage, 12 housing units were selected from each of the selected PSUs as the Secondary Sampling Unit (SSU), except from the strata of the districts in Western province. In the case of Western province, 10 housing units were selected from each selected PSUs in Colombo, Gampaha and Kalutara districts.

[3] Two tables include unpublished data of the 1971 and 1981 censuses and birth registration data from Department of Registrar General.

5.2.2. The Structure of the Questionnaire

The DHS survey used two basic questionnaires which comprised a household questionnaire and a women's questionnaire. Eligible women were all ever married women aged 10 to 49 years and they were identified based on the recorded information in the household questionnaire. The women's questionnaire was designed to collect data from ever-married women aged 10 to 49. However, as very few cases from the 10 to 14 age group were reported, the analyses are presented based on 15 to 49 age group. Eligible women were asked extensive series of questions under the following topics:

1. Background characteristics (place of residence, age, education, religion, ethnicity, marital status, media exposure, etc.)
2. Reproductive history
3. Knowledge and use of family planning methods
4. Pregnancy and postnatal care
5. Child immunization, health and nutrition
6. Fertility preferences
7. Husband's background and woman's work
8. Awareness about AIDS and other sexually transmitted infections (STIs)
9. Awareness about well-women clinics
10. Children who need special care (disabled)
11. Early childhood development
12. Other health issues

In order to achieve the objectives of the current study, data were mainly gathered from topics of 1, 2, 3, 4, 6 and 7.

5.2.3. Method of Data Collection

The Computer Assisted Personal Interview (CAPI) method was employed in data collection using mobile and wireless technology. The CAPI method allows the interviewers to enter

responses directly into a tablet computer database. After completing the survey, the interviewers close the respondents' data file and send it to the supervisor via Bluetooth file transfer system. The supervisors review the data for inconsistencies and provide immediate feedback to the interviewers. Eventually, the supervisor sends the completed data to the head office. Feedback from interviewers indicated that the use of CAPI can improve the data quality while effectively reducing the time for data collection. Thus, the new system ensures the data quality by improving the accuracy and reducing missing data (Department of Census and Statistics, 2017).

5.2.4. Methods of Quantitative Data Analysis

The study utilized univariate, bivariate and multivariate analysis as the methods of analysis. Descriptive statistics, cross tabulations and ordinary least squares (OLS) regression analysis were conducted. All the statistical analyses were performed using the STATA software package (Version. 16.1; StataCorp). Descriptive statistics, which include frequencies, cross tabulations, mean, median and standard deviation, were used to analyze the extent of the measurements of variables and to describe the characteristics and differentials of selected variables.

Linear regression is considered as a powerful tool for estimating the relationship between one variable and a set of other variables. A linear regression model is typically estimated by OLS, which minimizes the differences between the observed sample values and the fitted values from the model (Verbeek, 2017). Hence, an OLS regression analysis was performed to examine the relationship between explanatory variables and CEB. Those explanatory variables are comprised of selected characteristics of women included in four groups:

A- Demographic factors

B- Cultural factors

C- Female autonomy related factors

D- Contextual factors

The OLS regression is used to estimate the relationship between CEB and set of women's characteristics. Hence, the results of the regression analysis aimed at showing the variations in

CEB in a given category relative to the reference category. The OLS is conducted in four models aimed at predicting the dependent variable (Y) based on the values of selected independent variables (Xi). Model A is the base model including demographic factor of age at first marriage. Controlling for A, Model B tests cultural factor of religion. Controlling for Model A and B, Model C examines female autonomy related factors. Finally, controlling for all the variables mentioned, Model D examines contextual factor of sector of residence.

As young women have not completed their reproductive career, CEB is subject to vary largely depending on the age of women. In this case, it has been assumed that the women who were between ages 35 to 49 have completed their reproductive career by the time of survey. Accordingly, the regression analysis is conducted based on older women between 35 to 49 years of age ((N=10,376).

5.2.5. The Dependent and Independent Variables

The study design comprises one dependent variable and multiple independent variables to explain the relationships between CEB and women's selected characteristics.

5.2.5.1. Dependent Variable

Children Ever Born CEB is used as the main dependent variable in the present study as it reflects the final outcome of various childbearing behaviors[4]. Thus, the major measurement of current fertility is the total number of births a women had during her childbearing years. At the survey, respondents were asked about the total number of births of the respondent including children living with her, children living somewhere else and children born alive but who later died.

[4] The number of surviving children is also tested as it is also considered as a good dependent variable to measure current fertility. Since, the results were same, only CEB is presented in the analysis.

5.2.5.2. Independent Variables

Independent variables are classified into four groups allowing four models to be built which describe the impact of women's selected characteristics on childbearing.

Ever married women those born between 1967 and 1981 (aged 35 years or older at the time of survey) were included in the model. These women were classified into 3 year intervals (oldest birth cohort 2 year interval) generating 4 birth cohorts as 1967-69, 1970-73, 1974-77 and 1978-81 and controlled for 4 models. The youngest birth cohort, born between 1978 and 1981, was considered as the reference category.

A. Demographic factor: age at first marriage

The age at first marriage, which is the key exposure variable of childbearing, is categorized into four age groups as below 20 years, 20 to 24 years, 25 to 29 years and 30 years and above. Below 20 years is considered as the reference group.

B. Cultural factor: religious affiliations

The link between specific ethnic groups and religions is conceived historically in Sri Lanka. All Buddhists are ethnically Sinhalese. Muslims are the religious community who follows the teachings of Islam and they belong to Moors or Malays ethnically. All Hindus belong to Sri Lankan Tamils and Indian Tamils. However, Christians/Roman Catholics can be either Sinhalese or Tamil. As religion is considered as more important than ethnicity in Sri Lanka (Malalgoda, 1976; Rogers, 1994) religion is used to examine the variations in CEB. Thus, religion is categorized into 5 categories, namely, Buddhist (reference category), Hindu, Muslim, Roman Catholic and other.

C. Female autonomy related factor: education

Women's education is acknowledged as a proxy for female autonomy. Hence, depending on the proportionate share of educational achievements, education level is classified into three broad categories, namely, low, moderate and high. Respondents who never attended school, or attended preschool and passed grade 1 to 5 were categorized as having "low" education and that group was

considered as the reference group. Women who passed grade 6 to 12 (attained secondary level of education) were categorized as having "moderate" education while those who passed the Advanced Level (A/L) examination and above were categorized as having "high" education. Due to the issue of endogeneity, female autonomy associated major factors of female employment and wealth are not included in the model.

D. Contextual factor: sector of residence

The sector of residence is an important variable to examine the social context of the respondents. The categorization of urban, rural and estate sectors were done prior to the survey, as two stage stratification (district and sector) was utilized at the SLDHS sampling process. Based on that, residential areas are categorized into urban, rural and estate sectors while the reference category is urban. In addition, the role and perceptions of PHMs were analyzed based on PHMs employed sector. Though residential sector can be changed before and after the marriage, 88 percent of women did not changed their residential sector. In fact, 44 percent of women never moved while 4.7, 37.1 and 1.4 percent of women moved from urban to urban, rural to rural and estate to estate respectively. Since, nearly 90 percent of women were residing in the same residential sector, sector also included in the model. Residential sector assumed to influence childbearing patterns through cultural context and female autonomy.

5.3. Qualitative Data Sources (Interviews)

Limited qualitative data on PHMs role provided by SLDHS were not sufficient to achieve the objectives of the present study. Hence, a qualitative approach was employed to explore the role and perceptions of PHMs. Semi structured interviews were conducted to collect descriptive data from 16 PHMs working in urban, rural and estate sectors in Sri Lanka.

5.3.1. Sample

The residential sector is used as the most important single indicator of social context in the conceptual framework. Correspondingly, the sample was selected based on three main residential sectors in Sri Lanka. In fact, prior studies have suggested the prevalence of sectoral variations in

fertility and fertility intentions in Sri Lanka (Department of Census and statistics, 2009; Perera, 2017). Considering the composition of urban (18.2%), rural (77.4%) and estate (4.4%) populations in the country, the number of PHMs selected for interviews were five PHMs from the urban sector, nine PHMs from the rural sector and two PHMs from the estate sector (two estate PHMs were included in order to better represent the estate sector). Purposely, both urban and estate PHMs were chosen respectively from Battaramulla and Hanwella Medical Officer of Health (MOH) areas out of 17 MOH areas of the Colombo district. However, from the beginning of the research design, estate PHMs were planned to be selected from Nuwara Eliya district, where the majority of estate (Tamil) people lived. Unexpectedly, the research was faced with several barriers which hindered the attempt to get authorization to proceed. Optionally, estate PHMs were selected from the Hanwella MOH area in the Colombo district while rural PHMs were chosen from the Dompe MOH area out of 16 MOH areas of the Gampaha district.

Table 5.1: Characteristics of the participating PHMs and working area

Serial No.	Age	Ethnicity	Largest ethnic group in the working area	Experience as a PHM	Experience in the current working area	Employed sector	Education level
1	45	Sinhalese	Sinhalese	19 years	10 years	Urban	Passed A/L
2	24	Sinhalese	Sinhalese	4 months	4 months	Urban	Passed A/L
3	23	Sinhalese	Sinhalese	4 months	4 months	Urban	Passed A/L
4	34	Sinhalese	Sinhalese	4 months	4 months	Urban	Passed A/L
5	24	Sinhalese	Sinhalese	4 months	4 months	Urban	Passed A/L
6	59	Sinhalese	Sinhalese	28 years	18 years	Rural	Passed A/L
7	36	Sinhalese	Sinhalese	11 years	7.5 years	Rural	Passed A/L
8	59	Sinhalese	Moor	33 years	27 years	Rural	Passed O/L
9	51	Sinhalese	Sinhalese	25 years	20 years	Rural	Passed O/L
10	50	Sinhalese	Sinhalese	27 years	11 years	Rural	Passed A/L
11	51	Sinhalese	Sinhalese	27 years	27 years	Rural	Passed O/L
12	60	Sinhalese	Sinhalese	36 years	17 years	Rural	Passed O/L
13	51	Sinhalese	Sinhalese	20 years	17 years	Rural	Passed A/L
14	51	Sinhalese	Sinhalese	20 years	20 years	Rural	Passed A/L
15	35	Tamil	Tamil	5 years	5 years	Estate	Passed A/L
16	38	Sinhalese	Tamil	9 years	5 years	Estate	Passed A/L

Table 5.1 presents the background characteristics of the interviewed PHMs. The respondents' ages ranged from 23 years to 60 years while half of the respondents were aged 50 years or over. As described by both urban and rural PHMs, the great majority of the population in their working areas consist of Sinhalese while estate working areas consist of Indian Tamils. Additionally, the current study included a rural PHM who was working for a Muslim community which allowed an evaluation of ethnic religious specific childbearing patterns in Sri Lanka.

Permission for the interviews was obtained from the Regional Director of Health Services (RDHS) of Colombo and Gampaha districts followed by the Medical Officer of Health (MOH) of Battaramulla, Avissawella and Dompe. As all PHMs were gathered at the MOH office on the date of the interview, five urban PHMs were selected randomly based on the registration number[5] of each PHM while rural and estate PHMs were selected purposely. A total of 16 PHMs were selected and all selected PHMs agreed to participate in the interview.

5.3.2. Data Collection Method

Face to face semi-structured interviews were used as it allows collection of attitudinal information on a large scale (Fox, 2009) and it is the most frequent qualitative data source in health services research (DeJonckheere and Vaughn, 2019).

The design of the interview questions was briefly outlined after reviewing the relevant literature. Interviews were intended to gather in-depth information on the PHM training program and PHM services, characteristics of PHMs' working area, PHMs' perceived fertility preferences, PHMs' perceived contraceptive behavior of women and PHMs' perceived support from husband and extended family members in childbearing and childcaring. Immediately after a pilot survey, major changes were made to the basic structure of the interview. The interview schedule mostly contained open ended questions which were aimed at exploring the perceptions and the role of PHMs.

[5] A PHM holds a number according to their registration at the MOH office.

Both urban and rural interviews were conducted at the MOH offices while estate interviews were conducted at the PHM field offices from early November to mid December 2018. In order to build an effective rapport with more relaxed communication, interviews were conducted at a selected place which offered some privacy while preserving confidentiality. All the interviews were conducted by the author in Sinhala medium as the Tamil PHM also was able to communicate in Sinhala.

5.3.3. Methods of Qualitative Data Analysis

Thematic content analysis method has been used for the analysis of qualitative data in the study. First, all the interviews had to be transcribed into text data. Themes were developed from the beginning of data collection and continued throughout the process of analysis. Emerged themes were characteristics of PHMs' working areas, PHMs' training and services, PHMs' perceived fertility preferences, PHMs' perceived contraceptive behavior of women and PHMs' perceived support from family members in childbearing and childcaring.

5.4. Summary

In summary, the purpose of this chapter was to present the data sources and methodology employed in the study. Hence, both quantitative (SLDHS 2016) and qualitative (interviews) approaches of data sources, sample design and selection, methods of data collection and analysis were discussed.

CHAPTER SIX

Fertility Levels and Trends in Sri Lanka: A District Based Approach

6.1. Introduction

The fertility transition in Sri Lanka has been more dramatic compared to the other South Asian counterparts. As a leading nation in the region, the Sri Lankan fertility transition has been well documented with little discussion on regional variations of fertility. It is possible that the many regions of Sri Lanka are at different stages of fertility transition or that the pace of fertility transition is different between regions (Wijesekere and Arunachalam, 2015).

Country level fertility measures often tend to conceal the prevailing inter-regional differentials and actual fertility levels in a country whereas regional fertility measures are vital to explore the regional characteristics of fertility. Sri Lanka's current TFR, at 2.2, is close to the replacement level of 2.1 (Department of Census and Statistics, 2017). However, there are significant variations in fertility rates among districts. For instance, district fertility rates in Sri Lanka range from the lowest at 1.8 children per woman in Colombo, Gampaha and Rathnapura to the highest at 2.6 children per woman in Kandy and Kegalle (Department of Census and Statistics, 2017). As little attention has been devoted to regional fertility studies in Sri Lanka (Gajanayake, 1984; Yapa and Siddhisena, 1998), this chapter pays particular attention to examining fertility levels and trends among 25 districts (the second administrative divisions).[6]

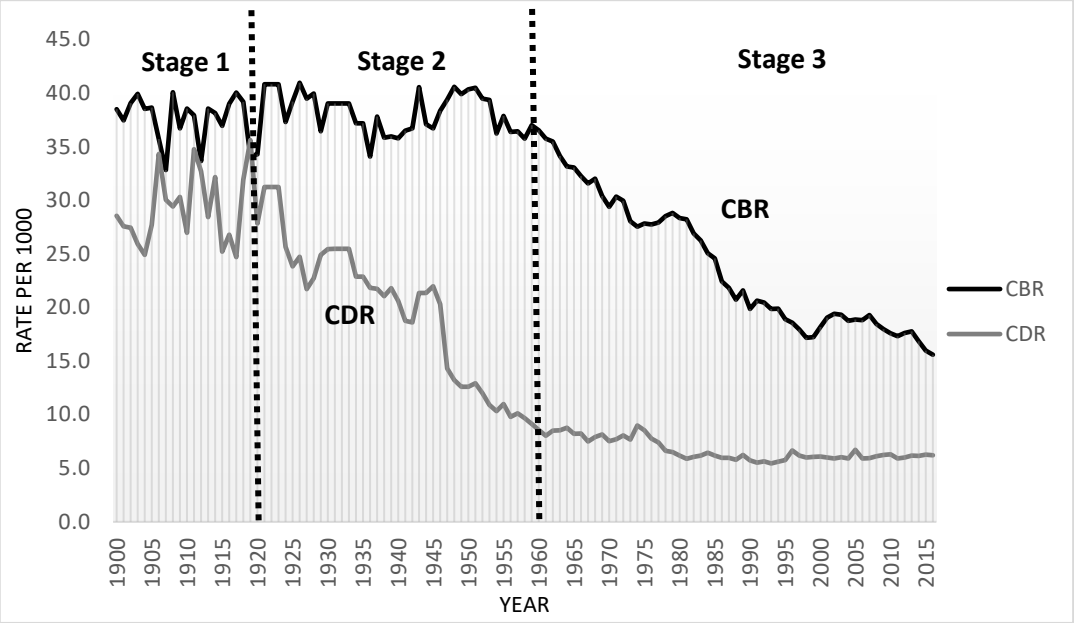
First, the chapter summarizes the national fertility levels and trends with a historical review of fertility transition. Second, providing a better understanding of characteristics of districts, district fertility levels and trends, and the influence of proximate determinants of fertility in shaping district fertility levels, this chapter attempts to improve the understanding of how context matters.

[6] SLDHS 2016 included the whole 25 districts of Sri Lanka though SLDHS 2006/07 did not include five war-affected districts in the Northern Province.

6.2. Fertility Levels and Trends in Sri Lanka

Sri Lanka's CBR and CDR remained at very high levels until the 1920s and this period can be considered as the high stationary phase of the Sri Lankan demographic transition. The decline in death rates during the 1920s marked the onset of mortality transition despite the significant fluctuations up to 1945 due to the malaria epidemic. A steady decline in the death rate can be observed afterwards while the birth rate remained at a high level (Dangalle, 1982). Immediately after the steady decline of CDR, the onset of fertility transition occurred in the early 1960s (Dangalle, 1982). Figure 6.1 presents a snapshot of the Sri Lankan demographic transition.

Figure 6.1: Historical Demographic Transition in Sri Lanka, 1900-2015



Source: The graph is made based on various reports of Department of Census and Statistics

Despite the declining birth rate, the Sri Lankan government faced the challenge of balancing available resources with the increasing population. In the population policy statement issued in 1991, the government set a target of achieving a replacement level of fertility by the year 2000 (Ministry of Health and Women's Affairs, 1992). Surprisingly, Sri Lanka showed a below replacement level of 1.9 a few years in advance of the targeted year (Department of Census and Statistics, 2002). Showing a TFR of 2.2 during 1990 to 1995, Bongaarts and Amin (2001) also

indicated that Sri Lanka was expected to reach replacement level by 1995. It is expected to remain constant until at least 2050, once fertility reaches the replacement level. With this rather low fertility level, many researchers also claimed that Sri Lanka had completed or was close to completing its transition to reach replacement fertility (De Silva, 1994; Langford, 2001; Arnold, 2001).

The below replacement level of fertility in Sri Lanka has yet become a subject of on-going debate.[7] To check whether Sri Lanka has actually achieved a below replacement level, Table 6.1 presents the historical transition of the TFR from its onset of fertility transition as gathered from various sources.

Table 6.1: Trends in total fertility rate (TFR) in Sri Lanka, 1963-2016

Source	Year	TFR
Census, registration	1963	5.0
World Fertility Survey	1974	3.4
Census, registration	1981	3.7
SLDHS-1987	1982-1987	2.8
SLDHS-1993	1988-1993	2.3
SLDHS-2000	1995-2000	1.9
SLDHS-2006/07	2006-2007	2.3
Census, registration	2012	2.4
SLDHS-2016	2016	2.2

Sources: Department of Census and Statistics 2002, 2009, 2015, 2017

As shown in Table 6.1, Sri Lanka's TFR gradually declined from 5 in 1963 to an all-time low of 1.9 in 2000. According to the most reliable, national survey conducted in 2000, it is evident that Sri Lanka has achieved a below replacement level during 1995 to 2000. However, if the below replacement level of fertility was sustained since then, the current TFR should be somewhere below the replacement level or somewhere around the lowest low fertility. Unexpectedly, Sri Lanka approached a unique transitional stage with a sudden increase of TFR

[7] Demonstrating the actual complete TFR values released by the Sri Lankan vital statistics system, UNFPA (2011) argued that TFR never fell below the replacement level and the country would not reach its stable population size by the middle of this century.

up to 2.3, well above the replacement level by 2006 (Department of Census and Statistics, 2009). Proving the increasing trend of fertility, the most recent population census in Sri Lanka also showed that the TFR continued to increase (Department of Census and Statistics, 2015). This unexpected increase is inconsistent with the conventional demographic transition theory. Among developing countries, no single country has demonstrated this kind of fluctuation in TFR, once it has reached a level of below replacement (De Silva et al., 2010).

The significant fluctuation in TFR grabs more research attention with a new concept of "below to above replacement of fertility in Sri Lanka". A number of studies have made possible explanations for this unprecedented reversal in fertility transition. De Silva and others (2010) pointed out that the very same factors which contributed to the decrease in fertility have also contributed to the increase in fertility, per se. Early marriages, less reliance on contraception and induced abortion have mainly contributed to the recent increase in fertility. In this regard, marriage may be particularly important. Hence, Table 6.2 presents the mean age at first marriage for both men and women in Sri Lanka starting from 1953.

Table 6.2: Trends of age at first marriage, 1953-2012

Year	Mean age at first marriage		
	Male	Female	Difference
1953	27.2	20.9	6.3
1963	27.9	22.1	5.8
1971	28.0	23.5	4.5
1981	27.9	24.4	3.5
2012	27.2	23.4	3.8

Source: Department of Census and Statistics, 2015

The latest mean age at first marriage for both males (27.2 years) and females (23.4 years) are a little less than the corresponding figures in 1971. In fact, female mean age at marriage was gradually increasing up to 1981. However, the most recent CPH proves that the mean age at marriage of females declined slightly compared to 1981 figures. As can be seen, male age at marriage reflects not much difference over time. Interestingly, males got married almost exactly the same as they did in 1953. Due to the relatively slow increase in male age at marriage compared

to females, the sex differential has dropped from 6.3 years to 3.8 years in 2012. In this way, the new trend of early marriages offer women some extra years for childbearing.

Moreover, the intention to replace the loss of people due to the civil war (1983-2009) and the Tsunami disaster (2004), the decrease in the male unemployment rate, the effect of strong pro-natalistic views, the increasing trend in female remarriage rate, the new government circular on public sector maternity leave, and less attention on family planning activities might have all contributed to the recent increase in TFR (De Silva et al., 2010). Perera (2017) also revealed that women who were less educated, lived in urban or rural areas, belonged to the ethnic groups of Moor or Tamil, and with wealth quintiles of poor or middle class were more likely to desire a larger family of more than two children when compared to their counterparts. Particularly, the concept of ethnic and religious minority is a decisive factor of increasing fertility in the country. For instance, other religious groups have a fear that Muslims could make up a majority of the Sri Lankan population, otherwise known as Islamophobia, or an exaggerated fear, hatred, and hostility toward Muslims.

As can be observed, short-term changes in socio-economic context, disasters, political and religious factors may all highly influence the childbearing behavior of women in Sri Lanka.

All in all, it became evident that there was a reversal in the trend of fertility transition in Sri Lanka during a short period after 2000, appears to be closely related to the change in the age at marriage. However, by 2016, TFR again placed somewhere around replacement level of fertility (2.2), proving that below to above replacement is a temporary phenomenon. In this context, it is vital to examine fertility levels and trends at district level to figure out how fertility varies across regions. Hence, the following section aims at analyzing fertility levels and trends at district level.

6.3. Characteristics of Districts

The population characteristics play a critical role in determining fertility levels and spatial fertility patterns in districts. Particularly, fertility levels may vary depending on various population characteristics such as age-sex composition, ethnicity, religion, female education and

employment status etc. This section will provide an understanding of the local context in which the regional variations in fertility has emerged.

Table 6.3: Percentage distribution of population by sector and ethnicity in 2012

District	Sector of residence			Ethnic composition		
	Urban	Rural	Estate	Sinhalese	Tamil	Muslim
Colombo	77.6	22.1	0.3	76.5	11.2	10.7
Gampaha	15.6	84.3	0.1	90.5	3.9	4.2
Kalutara	8.9	88.0	3.1	86.8	3.8	9.3
Kandy	12.4	81.4	6.2	74.4	11.2	13.9
Matale	12.4	83.6	3.9	80.8	9.8	9.2
Nuwara Eliya	5.6	40.9	53.5	39.6	57.6	2.5
Galle	12.5	85.7	1.8	94.4	1.9	3.6
Matara	11.9	85.3	2.8	94.3	2.6	3.1
Hambantota	5.3	94.7	0.0	97.0	0.4	1.1
Jaffna	20.1	79.9	0.0	0.4	99.2	0.4
Mannar	24.5	75.5	0.0	2.3	81.2	16.5
Vavuniya	20.2	79.8	0.0	10.0	83.1	6.8
Mullaitivu	0.0	100.0	0.0	9.7	88.2	2.0
Killinochchi	0.0	100.0	0.0	1.2	98.2	0.6
Batticaloa	28.7	71.3	0.0	1.3	72.7	25.4
Ampara	23.6	76.4	0.0	38.9	17.4	43.4
Trincomalee	22.4	77.6	0.0	26.7	31.1	41.8
Kurunegala	1.9	97.7	0.5	91.4	1.3	7.1
Puttalam	8.8	91.0	0.2	73.6	6.6	19.4
Anuradhapura	5.9	94.1	0.0	91.0	0.6	8.2
Polonnaruwa	0.0	100.0	0.0	90.7	1.8	7.4
Badulla	8.6	72.6	18.9	73.0	21.1	5.5
Moneragala	0.0	98.1	1.9	94.9	2.9	2.1
Ratnapura	9.1	81.7	9.2	87.1	10.7	2.1
Kegalle	1.9	91.3	6.8	85.5	7.3	7.1
Sri Lanka	**18.2**	**77.4**	**4.4**	**74.9**	**15.3**	**9.3**

Note: Other ethnic groups which represent less than 2 percent of district population are excluded.

Source: Department of Census and Statistics, 2015.

Table 6.3 presents percentage distribution of population by sector of residence and ethnicity which forms the crucial population characteristics in determining district fertility in Sri Lanka. The majority of Sri Lanka's urban population live in Colombo with 78 percent of its population living in urban areas. Other than Colombo, there is no single district on the island representative of at least 30 percent urban population. The most rural districts are Mullaitivu, Kilinochchi, and Polonnaruwa, with almost all of their populations tending to stick to either rural areas or small cities. Likewise, Moneragala, which is considered to be the poorest district in Sri Lanka, also

represents only rural and estate populations. The proportionate share of estate sector population is very low in the country, such that there are 11 districts that have no estate areas. On the other hand, more than half of the population (53.5%) in Nuwara Eliya lives in estates while nearly 20 percent of the population in Badulla also lives in estates.

Considering the ethnic composition, Sinhalese are the majority population in 16 districts of Sri Lanka. Nine districts report having more than 90 percent Sinhalese while Hambantota reports the highest at 97 percent. The second largest ethnic group within the population is the Tamil population. Almost all of the inhabitants in Jaffna are Tamil while the 4 other districts of Northern Province are also home to an overwhelming majority of more than 80 percent Tamil people. Muslims represent simple majority in Ampara and Trincomalee, while no single district other than Batticaloa consist of more than 20 percent Muslims. In addition, seven districts show a concentration of more than 10 percent of Muslims. Overall, the population of three main ethnic groups have spread throughout the country though the proportion varies largely.

Being a multi-ethnic and multi-religious developing country, the population characteristics discussed above can be assumed to play a crucial role in determining fertility levels and trends in districts of Sri Lanka.

6.4. Fertility Levels (TFR) by District

The following section uses TFRs to assess the variations in fertility at a district level. Available evidence in national figures suggests a steady decline in fertility from 1971 to 2001, whereas district TFRs reflect various transitional stages of fertility transition (Table 6.4).

Table 6.4: Total Fertility Rate (TFR) by district, 1971- 2016

District	1971[a]	1981[a]	2001[b]	2006[c]	2012[d]	2016[e]	1971-1981 Change	1981-2001 Change	2001-2006 Change	2006-2012 Change	2012 -2016 Change
Colombo	3.80[#]	3.34	2.07	2.20	2.00	1.80	-0.50	-1.27	0.13	-0.20	-0.20
Gampaha		2.22	1.88	2.20	2.07	1.80	-1.60	-0.34	0.32	-0.13	-0.27
Kalutara	3.43	3.15	2.23	2.20	2.34	2.20	-0.28	-0.92	-0.03	0.14	-0.14
Kandy	4.15	3.84	2.53	2.40	2.47	2.60	-0.31	-1.31	-0.13	0.07	0.13
Matale	4.66	3.50	2.37	*	2.63	1.90	-1.16	-1.13	n.a	n.a	-0.73
Nuwara Eliya	3.98	2.93	2.47	2.60	2.83	2.20	-1.05	-0.47	0.13	0.23	-0.63
Galle	3.53	3.11	2.29	2.10	2.39	2.10	-0.42	-0.83	-0.19	0.29	-0.29
Matara	4.57	3.73	2.50	2.40	2.47	2.30	-0.84	-1.23	-0.10	0.07	-0.17
Hambantota	4.90	3.63	2.48	2.30	2.71	1.90	-1.27	-1.14	-0.18	0.41	-0.81
Jaffna	4.11	3.75	--	--	2.00	2.10	-0.36	n.a	n.a	n.a	0.10
Mannar	5.30	3.80	--	--	2.62	2.00	-1.50	n.a	n.a	n.a	-0.62
Vavuniya	5.91	3.22	--	--	2.51	2.00	-2.69	n.a	n.a	n.a	-0.51
Mullaitivu	--	--	--	--	2.53	2.00	n.a	n.a	n.a	n.a	-0.53
Killinochchi	--	--	--	--	2.64	2.10	n.a	n.a	n.a	n.a	-0.54
Batticaloa	5.72	4.83	-	2.80	2.52	2.40	-0.89	n.a	n.a	-0.28	-0.12
Ampara	5.13	3.48	2.65	2.90	2.73	2.40	-1.64	-0.84	0.25	-0.17	-0.33
Trincomalee	5.39	4.94	-	2.90	3.02	2.30	-0.45	n.a	n.a	0.12	-0.72
Kurunegala	4.03	2.92	2.18	2.50	2.43	2.20	-1.11	-0.74	0.32	-0.07	-0.23
Puttalam	4.43	3.56	2.46	2.00	2.61	2.10	-0.87	-1.11	-0.46	0.61	-0.51
Anuradhapura	5.25	3.94	2.25	2.30	2.74	2.40	-1.30	-1.69	0.05	0.44	-0.34
Polonnaruwa	4.88	3.49	2.37	2.50	2.68	2.50	-1.39	-1.12	0.13	0.18	-0.18
Badulla	4.49	3.45	2.54	2.40	2.60	2.30	-1.04	-0.91	-0.14	0.20	-0.30
Moneragala	5.49	4.98	2.39	2.50	2.73	2.40	-0.51	-2.59	0.11	0.23	-0.33
Ratnapura	4.12	3.69	2.25	2.40	2.39	1.80	-0.42	-1.44	0.15	-0.01	-0.59
Kegalle	3.09	2.73	2.36	2.50	2.49	2.60	-0.36	-0.37	0.14	-0.01	0.11
Sri Lanka	**4.13**	**3.38**	**2.26**	**2.30**	**2.40**	**2.20**	**-0.75**	**-1.12**	**0.04**	**0.10**	**-0.20**

Notes: '--' indicates data not available, 'n.a' indicates not applicable, * indicates a TFR based on fewer than 500 unweighted women that has been suppressed.

[#] Gampaha district was a part of Colombo district, until 1978 and therefore TFR of 1971 is presented together.
Early DHSs were not able to fully cover the whole country due to the exclusion of Northern Provinces and some districts of Eastern Province. Therefore, to check whether there is a possibility of representative bias, the TFR of Sri Lanka was also calculated excluding five war affected districts in the Northern Province. The difference was negligible confirming that there is no way of a representative bias occurring.

Sources:

[a] 1971 and 1981 TFRs were calculated by the author using Table 3 and 4 of the annexure in Gajanayake (1984).

[b] TFRs for 2001 were calculated by the author using unpublished data from the 2001 population census and vital statistics (birth registration) data of 2001.

[c] Department of Census and Statistics, 2009; [d] Department of Census and Statistics, 2015; [e] Department of Census and Statistics, 2017.

Early DHSs were not able to fully cover the whole country due to the exclusion of Northern Province and some districts of Eastern Province. Therefore, to check whether there is a possibility of representative bias, the TFR of Sri Lanka was also calculated excluding five war affected districts in Northern Province. The difference was negligible confirming that there is no way of a representative bias occurring.

As shown in Table 6.4, all districts achieved a remarkable decline of fertility until 2006, though the pace of decline varies largely. Reflecting a high variation of TFRs across districts, the

standard deviation is as high as 0.80 and 0.66 during the years 1971 and 1981 respectively. However, the standard deviation declined to 0.24 in 2006 and the value remains constant even in 2016. Similarly, in 1971, the lowest TFR was 3.09 in Kegalle and the highest was 5.91 in Vavuniya. In contrast, the most recent figures of SLDHS 2016 show that TFRs in Sri Lanka range from the lowest at 1.8 in Colombo, Gampaha and Rathnapura, to the highest at 2.6 in Kandy and Kegalle. Accordingly, the gap between the highest and the lowest TFR went from about three children in 1971 to about one child in 2016. Hence, it is obvious that TFRs in districts of Sri Lanka currently lie within a narrow range as compared to the past, proving that fertility levels have been converging among districts. Surprisingly, Kegalle reported the lowest TFR at the onset of fertility transition and the highest TFR later in the transition.

In 2006, TFR already reached lower levels such that no single district in Sri Lanka reported a TFR of above 3 children per women. By then, a slower fertility decline appears in all districts and there is no reduction of at least one childbirth in 2012 and 2016. The average number of live births per woman by the time she reaches the age of 50 is highest (5.9) in Vavuniya in 1971, where more than 80 percent of its population is comprised of Tamils. Subsequently, TFR shows a dramatic reduction of nearly 3 children (2.7) per woman by the next decade. Similarly, TFR in Moneragala also fell by half during the twenty-year period from 1981 to 2001. On the other hand, TFR in Gampaha is comparably lower than other districts and the national average throughout the period while its TFR remained stable near the replacement level even in 1981.

The declining trend in TFR unexpectedly changed to an upward trend after 2001. About ten districts represented a minor increase in TFR in 2006 for the first time in the transitional process. This increasing trend was demonstrated in 12 districts even in 2012, while Puttalam showed the highest increase in TFR from 2006 to 2012 at 30 percent. Overall, it is obvious that there is some increase of fertility in almost all districts between 2006 and 2012. This increase in district TFRs was clearly mirrored by the increase in national TFR in 2006 and 2012. However, in 2016, fertility levels again dropped throughout the country with the exceptions of Kandy, Jaffna and Kegalle.

6.5. The Influence of Proximate Determinants of Fertility

Four proximate determinants of fertility, the proportion of women married, use of contraception, postpartum infecundability, and induced abortion (Bongaarts and Potter, 1983) are considered as essential for the analysis of fertility levels and trends. Hence, depending on the availability of data, the current study descriptively examines the influence of proximate determinants in shaping district fertility levels and trends. However, as abortion is illegal, reliable data on induced abortion is unavailable in Sri Lanka. Therefore, the influence of induced abortion was impossible to analyze in the current study.

6.5.1. Proportion of Women Married: Timing of Marriage, Sexual Intercourse and Childbirth

The proportion married and never married reflects the prevalence of marriage in an area. Being married still continues to be the most common marital status of women in Sri Lanka (Table 6.5).

Table 6.5: Percentage distribution of women by marital status in 2012

District	Marital status of women (age15 +)	
	Married	Never married
Colombo	66.6	25.4
Gampaha	66.5	23.1
Kalutara	68.4	21.4
Kandy	67.6	23.2
Matale	70.8	18.9
Nuwara Eliya	69.7	20.4
Galle	66.8	23.2
Matara	67.2	23.2
Hambantota	70.1	20.7
Jaffna	56.8	29.1
Mannar	64.4	25.5
Vavuniya	60.5	26.7
Mullaitivu	63.7	21.7
Killinochchi	62.3	24.2
Batticaloa	63.4	23.5
Ampara	68.1	21.4
Trincomalee	67.9	21.5
Kurunegala	69.0	19.1
Puttalam	68.6	19.2
Anuradhapura	71.2	18.1
Polonnaruwa	72.7	17.0
Badulla	69.8	20.5
Moneragala	73.4	18.7
Ratnapura	70.8	20.7
Kegalle	67.9	20.8
Sri Lanka	**67.8**	**22.0**

Source: Department of Census and Statistics, 2015.

The proportion of women at the age of fifteen or over who were already married is the highest (73%) in Moneragala followed by Matale, Hambantota, Anuradhapura and Polonnaruwa (all above 70%). Other than war affected areas, those are the districts with the highest prevalence of teenage pregnancies in Sri Lanka (FHB, 2010). This implies that the higher prevalence of early marriages in such areas has contributed to an increase of teenage pregnancies. Conversely, the proportion of never married (30%) in Jaffna is the highest, even when compared to Colombo (25%) where both administrative and commercial capitals are located. Only 17 percent of women aged 15 years and above remain unmarried in Polonnaruwa, implying the regional diversity of nuptiality patterns in Sri Lanka. Further, it is obvious that almost all districts in war affected Northern Province except Mullaitivu seem to have a high proportion of women who have never

married, as compared to the national level. This reflects the effect of marriage squeeze in such areas due to conflicts related to the excess deaths of men.

Table 6.6 presents a comparison of women's median age at first marriage, first sexual intercourse and first birth at 2006/07 and 2016. The median age at first marriage for women is rising slightly except in Kalutara and Kegalle. This implies that those of younger generations get married later than their previous generations. The majority of women in Anuradhapura and Batticaloa got married as early as age 20 and 22, respectively. On the other hand, women in Colombo, Gampaha, Kalutara, Matara and Kegalle got married more than one year later compared to other women in the country in 2006/07. This trend continues only in Colombo and Gampaha in 2016. Convincingly, women in war affected Jaffna have remained unmarried for more than 25 years and reported the highest mean age at first marriage in Sri Lanka in 2016. Overall, it is obvious that the majority of women got married after passing their teenage years in each and every district of the country. This trend can be considered as evidence of the lower prevalence of teenage pregnancies in the country. As a whole, most women got married between the ages of 20 and 25 in 2006 and 22 to 25 in 2016. Thus, the lowest median age at marriage has significantly increased while the highest median age at marriage remained constant. Furthermore, the highest increase of age at marriage can be observed in Kandy, Hambantota, Anuradhapura and Ampara over the period.

Table 6.6: Median age at first marriage, first sexual intercourse and first birth among all women aged 25-49 in 2006/07 and 2016

District	First marriage			First sexual intercourse			First birth		
	2006/07	2016	Difference	2006/07	2016	Difference	2006/07	2016	Difference
Colombo	24.8	24.9	0.1	a	24.9	n.a	a	a	n.a
Gampaha	24.5	24.9	0.4	24.7	24.9	0.2	a	a	n.a
Kalutara	24.6	24.4	-0.2	25.0	24.4	-0.6	a	a	n.a
Kandy	23.5	24.6	1.1	23.7	24.5	0.8	a	a	n.a
Matale	22.6	22.8	0.2	22.8	22.8	0.0	24.6	24.9	0.3
Nuwara Eliya	22.5	23.0	0.5	22.8	23.4	0.6	23.9	24.9	1.0
Galle	24.1	24.5	0.4	24.2	24.5	0.3	a	a	n.a
Matara	24.5	24.5	0.0	24.6	24.5	-0.1	a	a	n.a
Hambantota	23.2	24.3	1.1	23.3	24.4	1.1	24.9	a	n.a
Jaffna	--	25.0	n.a	--	25.0	n.a	--	a	n.a
Mannar	--	23.0	n.a	--	22.9	n.a	--	24.9	n.a
Vavuniya	--	23.0	n.a	--	23.4	n.a	--	24.7	n.a
Mullaitivu	--	21.7	n.a	--	21.6	n.a	--	23.1	n.a
Killinochchi	--	22.5	n.a	--	22.5	n.a	--	23.9	n.a
Batticaloa	21.3	21.6	0.3	21.7	21.6	-0.1	23.8	23.6	-0.2
Ampara	21.2	22.2	1.0	21.4	22.3	0.9	22.9	24.2	1.3
Trincomalee	21.0	21.7	0.7	21.2	21.8	0.6	22.6	23.4	0.8
Kurunegala	22.6	23.5	0.9	22.9	23.5	0.6	24.6	a	n.a
Puttalam	21.3	21.9	0.6	21.7	22.0	0.3	23.0	24.0	0.0
Anuradhapura	20.4	21.7	1.3	20.7	21.7	1.0	22.4	23.9	1.5
Polonnaruwa	21.5	21.7	0.2	21.7	21.7	0.0	23.1	23.9	0.8
Badulla	22.5	22.8	0.3	23.0	22.8	-0.2	24.1	24.5	0.4
Moneragala	21.8	21.8	0.0	22.0	21.9	-0.1	23.6	24.1	0.5
Ratnapura	22.8	23.4	0.6	23.0	23.5	0.5	24.6	a	n.a
Kegalle	24.4	24.1	-0.3	24.5	24.1	-0.4	a	a	n.a
Sri Lanka	**23.3**	**23.7**	0.4	**23.6**	**23.7**	0.1	**25.1**	**a**	**n.a**

Notes: '--' indicates data not available, 'n.a' indicates not applicable.

[a] Less than 50 percent of the women had a birth before reaching the beginning of the age group and therefore were omitted.

Sources: Department of Census and Statistics, 2009 and 2017.

The median age at first sexual intercourse is a summary measure of the average age at which women initiate sexual relationships. As shown in Table 6.6, the median age at first sexual intercourse is rising in most districts, with a few exceptions. The median age at first sexual intercourse often appears later than the median age at first marriage in the majority of districts in 2006. This reflects the fact that most of the legally married couples in Sri Lanka tend to postpone their first sexual intercourse until the traditional wedding ceremony takes place[8]. Thus, couples

[8] Most marriages in Sri Lanka take place at a registry and become legal marriages once the marriage registration is completed. Often later on the same day as the legal registration, or a few months afterwards a traditional marriage ceremony takes place.

start living together sometime later than the legal marriage registration. However, in 2016, there is no gap between the age at first marriage and the age at first sexual intercourse in most districts as well as at the national level. Yet, there is evidence of pre-marital sexual relationships in a few districts such as Kandy, Mannar and Mullaitivu in 2016, where more than half of the respondents reported having their first sexual intercourse sometime before marriage.

The age at which mothers give birth to their first child is also highly determined by the socio-cultural, ethnic and religious background of a woman. The median age of mothers at first birth in Sri Lanka was reported as aged 25 in 2006 (Table 6.6). On average the age at first birth has slightly increased throughout the period except in Batticaloa, where ethnoreligious minority groups (Tamil and Muslim) are concentrated. Likewise, only three districts (Batticaloa, Matale and Anuradhapura) reported a gap of two or more years from marriage to first birth in 2006 while most districts do so in 2016. Thus, it is evident that the interval between marriage and first birth is on the increase and most couples tend to delay their first birth using effective contraceptive methods.

6.5.2. Prevalence of Contraceptive Use

Contraceptive prevalence is subject to vary on socio-cultural, ethnic, religious, political, and various other individual factors, including level of education, access to facilities and concerns about contraceptive side-effects. As shown in Table 6.7, the majority of districts reflect some decrease in contraceptive use from 2006/07 to 2016. The trend shows an increase of modern method users with a decrease of traditional method users. Available data prove that contraceptive prevalence in war affected Mannar is extremely low (18.4%) with non-use of traditional methods. Only Batticaloa, where Tamil and Muslim populations are concentrated, shows some increase (2.5%) in traditional methods during the period.

Table 6.7: Current use of contraception in 2006/07 and 2016

District	Any method			Modern method			Traditional method		
	2006/07	2016	Difference	2006/07	2016	Difference	2006/07	2016	Difference
Colombo	65.2	60.5	-4.7	46.2	47.4	1.2	19.0	13.2	-5.8
Gampaha	67.3	67.3	0.0	46.4	52.0	5.6	21.0	15.3	-5.7
Kalutara	69.8	73.8	4.0	52.1	55.4	3.3	17.7	18.4	0.7
Kandy	69.1	61.8	-7.3	57.1	52.3	-4.8	12.0	9.5	-2.5
Matale	70.7	71.4	0.7	60.4	61.7	1.3	10.2	9.6	-0.6
Nuwara Eliya	69.5	66.6	-2.9	63.2	62.7	-0.5	6.3	3.9	-2.4
Galle	73.6	70.6	-3.0	48.9	53.8	4.9	24.1	16.8	-7.3
Matara	68.8	65.0	-3.8	49.0	52.9	3.9	19.8	12.0	-7.8
Hambantota	69.5	64.5	-5.0	47.0	54.0	7.0	22.4	10.5	-11.9
Jaffna	--	46.6	n.a	--	42.7	n.a	--	3.8	n.a
Mannar	--	18.4	n.a	--	18.4	n.a	--	0.0	n.a
Vavuniya	--	33.0	n.a	--	30.7	n.a	--	2.2	n.a
Mullaitivu	--	67.2	n.a	--	63.9	n.a	--	3.4	n.a
Killinochchi	--	58.4	n.a	--	56.3	n.a	--	2.2	n.a
Batticaloa	34.5	31.5	-3.0	34.0	28.5	-5.5	0.5	3.0	2.5
Ampara	55.7	45.7	-10.0	49.9	40.6	-9.3	5.9	5.1	-0.8
Trincomalee	52.8	48.6	-4.2	49.7	45.4	-4.3	3.0	3.2	0.2
Kurunegala	75.5	69.5	-6.0	58.0	55.8	-2.2	17.6	13.7	-3.9
Puttalam	66.1	69.3	3.2	52.5	55.6	3.1	13.5	13.7	0.2
Anuradhapura	74.0	67.2	-6.8	62.6	62.5	-0.1	11.3	4.7	-6.6
Polonnaruwa	77.8	72.3	-5.5	68.3	67.0	-1.3	9.5	5.3	-4.2
Badulla	72.4	71.3	-1.1	62.0	64.7	2.7	10.4	6.6	-3.8
Moneragala	71.1	72.7	1.6	57.4	63.7	6.3	13.7	9.0	-4.7
Ratnapura	73.4	74.4	1.0	54.3	55.8	1.5	19.1	18.5	-0.6
Kegalle	70.9	66.9	-4.0	49.8	59.3	9.5	21.1	7.6	-13.5
Sri Lanka	**68.4**	**64.6**	**-3.8**	**52.5**	**53.6**	**1.1**	**15.9**	**11.0**	**-4.9**

Notes: '--' indicates data not available, 'n.a' indicates not applicable.

Modern methods include female and male sterilization, pill, IUD, injectable, implant and condom while traditional methods include rhythm, withdrawal, and other methods.

Sources: Department of Census and Statistics, 2009 and 2017.

Contraceptive prevalence in Sri Lanka appears to be exceptional in that less developed rural districts report higher contraceptive prevalence as compared to urban districts. In 2006/07, the highest proportion of any method users and traditional method users are reported from Rathnapura where more than 90 percent of its population live in rural or estate sectors (see Table 6.7). As indicated in the 2012 population census report, Polonnaruwa remains within the four districts that have no urbanized characteristics in Sri Lanka (Department of Census and Statistics, 2015). Despite its lower level of urbanization, the highest number of any method users as well as modern method users is reported from Polonnaruwa in 2016. On the other hand, some districts in which war affected and ethnoreligious minority groups (Tamil and Muslim) were concentrated (Mannar and Vavuniya, Batticaloa, Ampara and Trincomalee) were reported to have particularly low levels

of contraceptive use. This implies that ethnic-religious background and the influence of war seems to be more decisive than the urban rural factor regarding contraceptive use in Sri Lanka.

The desire to limit childbearing of women in Sri Lanka is particularly high, irrespective of residence. Women in Badulla and Nuwara Eliya had the highest (70%) desire to limit childbearing in 2006/07 (Table 6.8).

Table 6.8: Percentage of currently married women who desire to limit childbearing in 2006/07 and 2016

District	Percentage of women who desire to limit child bearing			
	All currently married women		Women with two children	
	2006/07	2016	2006/07	2016
Colombo	59.2	60.0	79.9	79.4
Gampaha	61.5	64.7	77.8	80.8
Kalutara	61.8	62.3	78.3	80.1
Kandy	60.2	61.2	74.8	73.4
Matale	59.7	62.0	71.3	75.7
Nuwara Eliya	69.0	67.2	74.2	77.0
Galle	58.0	62.6	67.3	78.5
Matara	53.0	65.3	63.6	77.6
Hambantota	56.5	60.0	53.6	75.7
Jaffna	--	53.0	--	69.4
Mannar	--	33.7	--	40.3
Vavuniya	--	47.6	--	62.6
Mullaitivu	--	64.6	--	73.5
Killinochchi	--	64.2	--	71.6
Batticaloa	56.5	55.9	49.6	66.6
Ampara	54.8	49.6	55.2	55.3
Trincomalee	43.4	50.0	40.2	51.8
Kurunegala	63.5	63.6	82.9	82.2
Puttalam	60.1	62.7	67.1	72.4
Anuradhapura	56.3	57.4	62.3	69.4
Polonnaruwa	61.3	64.0	77.7	72.1
Badulla	70.3	61.9	80.5	72.2
Moneragala	56.8	62.1	65.2	74.5
Ratnapura	62.8	60.7	79.4	78.7
Kegalle	60.9	68.9	78.6	88.2
Sri Lanka	**60.2**	**61.1**	**73.5**	**75.9**

Notes: '--' indicates data not available.

Sources: Department of Census and Statistics, 2009 and 2017.

The desire to limit childbearing further increased in most districts by 2016, except in Badulla, Nuwara Eliya, Batticaloa, Ampara and Rathnapura. The highest increase can be observed in

Matara, from 53 percent in 2006/07 to 65 percent in 2016. Badulla was reported to have a considerable drop of desire to limit childbearing from 70 percent in 2006/07 to 62 percent in 2016.

The desire to limit childbearing of women with two children reflects the direction of replacement fertility in the area. More than 80 percent of married women who had their second child in Kurunegala and Badulla did not want to have more children in 2006/07. In contrast, the majority of women with two children in Trincomalee and Batticaloa, where Muslims have been concentrated, did not intend to limit child-bearing, reflecting the desire for a higher number of births and deviation from the replacement level. More than 70 percent of women in 18 districts expressed their desire to have no more children, while this was observed in only 11 districts in 2006/07 (Table 6.8). During the ten year period, a dramatic increase of more than 22 percent can be observed from women in Hambantota, where highest proportion of Sinhalese people lived. Women with two children in Kegalle report the highest desire to limit childbearing in 2016. However, unexpectedly, it is one of the two districts with the highest TFR in 2016. Furthermore, it is clear that the desire to limit childbearing of all women as well as women with two children is relatively low in war affected Mannar and Vavuniya together with the ethnoreligious minority community concentrated Ampara, Trincomalee and Batticaloa. Overall, the percentage of women with two children, who desire to limit childbearing, is increasing in 2016 as compared to 2006/07.

6.5.3. Postpartum Infecundability

Postpartum infecundability is primarily related to breastfeeding, which inhibits ovulation. It is the time after a birth without regular ovulation and menstruation. Bongaarts stressed that the duration of postpartum infecundity is primarily a function of breastfeeding behavior in the absence of modern contraception (Bongaarts & Potter, 1983). In the current study, the median duration of breastfeeding has been utilized to determine the effect of postpartum infecundability. The median duration of any breast feeding in Sri Lanka is as long as 33 months (2.9 years) proving that the duration of breastfeeding is much longer.

Table 6.9: Median duration of breastfeeding in 2006/07

District	Median duration (months) of breastfeeding		
	Any	Exclusive	Predominant
Colombo	30.4	4.5	4.9
Gampaha	34.0	4.2	4.4
Kalutara	u	3.3	3.3
Kandy	u	5.6	5.7
Matale	32.4	5.4	5.5
Nuwara Eliya	29.4	3.1	3.4
Galle	u	3.4	3.4
Matara	u	3.4	4.0
Hambantota	31.8	4.3	5.1
Batticaloa	23.1	4.1	4.6
Ampara	28.9	1.3	2.0
Trincomalee	27.7	3.8	4.8
Kurunegala	u	4.6	4.8
Puttalam	31.8	5.3	5.6
Anuradhapura	u	5.2	5.6
Polonnaruwa	33.3	5.3	6.3
Badulla	u	5.0	5.3
Moneragala	u	5.1	5.9
Ratnapura	u	4.6	5.1
Kegalle	33.8	5.0	5.0
Sri Lanka	33.0	4.5	4.8

Notes: The estimates of median duration of breastfeeding are based on current status data, that is, the proportion of children in the three years preceding the survey who were being breastfed at the time of the survey.

u= Unavailable due to long duration of breastfeeding.

Source: Department of Census and Statistics, 2009.

The duration of exclusive breast feeding is considered as a proxy for the length of postpartum infecundability as it biologically extends the amenorrhea period. Table 6.9 shows that the duration of exclusive breast feeding is longest (5.6) in Kandy. Both exclusive and predominant breast feeding is shortest in Muslim concentrated Ampara, proving that the majority of children are not breastfed even within the first three months of life. The duration of any breast feeding also seems to be relatively short in other Muslim populations concentrated in Batticaloa and Trincomalee reflecting the fact that the Muslim population are less likely to breast-feed their children than other groups. The lower prevalence of breastfeeding practices among Muslims may contribute to increase their fertility as it caused a resumption of the ovulation process earlier than otherwise.

6.6. Discussion and Conclusion

This chapter analyzed fertility levels and trends in Sri Lanka at the national level as well as at the regional level mainly based on 2006/07 and 2016 SLDHSs. The contribution of proximate determinants of fertility on regional variations was also examined.

Fertility transition began far earlier in Sri Lanka than in other South Asian countries. In spite of lower economic development and thirty years of war, people in Sri Lanka have benefited from free education and free health facilities for decades. As a result, Sri Lanka has achieved more favorable demographic levels with an advanced level in terms of fertility transition. The continuous declining trend in fertility from its onset of fertility transition succeeded in catching up to the replacement level by 1995 and further continued until it fell below replacement level. Once reaching its minimum point of 1.9 children per woman during 1995 to 2000, TFR showed a significant reversal with 2.3 children per woman by 2003. The increasing trend in fertility was observed even in 2012. During the six-year period, fertility rates in almost all districts reflected some increase.

The current analysis revealed that as theory predicts, the regional variations in fertility have been declining in recent decades, suggesting a convergence in fertility, occurring later in the transition. It showed that major driving forces of fertility transition in Sri Lanka have led to similar fertility outcomes in most regions, in spite of the different socio-economic and demographic characteristics of the districts. According to SLDHS 2006/07, no single district reported a TFR below 2.0 and the TFR ranges from 2.0 to 3.0. A similar pattern is reflected even in 2016 where TFR ranges from 1.8 to 2.6 in well urbanized cities as well as typical rural areas. This may be due to the widespread access to modern contraceptives without any sectoral variation, the provision of knowledge and family planning services through the midwifery system (PHMs), the progress achieved through modernization and industrialization, the lower variation in infant mortality rates, and the overall development of child health in the country. Gampaha district shows the lowest fertility over time, while nearby Colombo, the capital of Sri Lanka also reflects a relatively low

fertility level. In contrast, Kandy and Kegalle have the highest fertility in 2016. The ethnoreligious minority concentrated in Ampara (2001 and 2006) and Trincomalee (1981, 2006 and 2012) also reported the highest fertility earlier.

Being married continues to be the most common marital status in Sri Lanka. However, the most recent SLDHS provided evidence of pre-marital sexual relationships from Kandy, Mannar and Mullaitivu. Typically, women who got married at an early age have a long period for childbearing, often leading to a larger number of children being born. The current study revealed that women's age at first marriage is slightly increasing in all districts except Kalutara and Kegalle. It is surprising to note that war affected Jaffna district reports the highest mean age at marriage by 2016. Even though the age at marriage is evident for the lower prevalence of teenage pregnancies in the country, it should be noted that the age at marriage is heavily dependent on the ethnic and religious background of the women. Additionally, previous studies have stated that changes in marriage patterns in Sri Lanka relate to the breakdown of arranged marriage, as in many countries in East and South East Asia (Caldwell, 1996; De Silva, 2000). Thus, unlike other South Asian countries, love marriages appear to be more common and welcoming in Sri Lanka recently.

The analysis showed that most women tend to initiate their first sexual intercourse a few months after their marriage. It reflects the practice of marriage registration sometime before the traditional marriage ceremony. The age at first marriage, first sexual intercourse and first birth are rising in most districts in Sri Lanka. Well educated women in more socially liberal countries have children later, while those less educated and in poorer countries tend to have children at an earlier age, as teenagers or even much earlier. Therefore, the age at first birth can be considered as an indicator of the social status of women. Reflecting a favorable status, women in Sri Lanka give birth to their first child at the age of 25. Remarkably, the largest span from marriage to first birth appears in the poorest district of Moneragala in 2006 and in Tamil and Muslim concentrated

Batticaloa in 2016. Despite the fact that the gap between marriage and first birth is increasing, marriage is still closely related to the first birth for a couple.

As a result of extended awareness programs for contraceptive methods, the knowledge of contraceptive methods remains extremely high at 100 percent in all districts in the country, irrespective of education levels or wealth quintiles (Department of census and statistics, 2017). Likewise, Sri Lanka has achieved the highest contraceptive prevalence rate since the 1980s (Kantner and He, 2001). Nevertheless, recent data shows that contraceptive prevalence in Sri Lanka is decreasing from 70.6% in 2006/07 to 65.6% in 2016 while modern contraceptive method users are steadily increasing from 40.6 in 1987 to 54.1% in 2016. Even so, well educated women are less likely to use modern methods compared to less educated women. Alternatively, well educated women seem to prefer traditional methods, especially the rhythm method (Department of Census and Statistics, 2017). Other than education level, there are various socio-economic and cultural factors that influence contraceptive behavior. However, the current study found that there was no negative association between urban characteristics and usage of contraceptives. According to Hettiarachchi and Gunawardena (2012), the choice of traditional method was associated with personal factors as well as service gaps.

The current analysis suggests that Muslim mothers breastfeed their children for a relatively shorter duration than other mothers in Sri Lanka. Policy guidelines for breastfeeding in Sri Lanka are in accordance with UNICEF and WHO recommendations wherein children be exclusively breastfed during the first six months of life and given solid or semisolid complementary food in addition to continued breastfeeding from 6 months until age 24 months or more, until the child is fully weaned (Department of Census and Statistics, 2009). Despite the above recommendations, the majority of children in Ampara have been breastfed a relatively short period of 1.3 months, implying there are health risks for such children.

6.7. Summary

To summarize, the present chapter, which is descriptive and exploratory in nature, aimed to provide the reader with a better understanding of the national and district fertility levels and trends while exploring the influence of proximate determinants of fertility in shaping district fertility levels in Sri Lanka. This descriptive analysis provides a concise summary of the socio-economic and demographic structure of the community with current levels and recent trends of childbearing in recent decades. However, up to this point, little is known about current fertility and women's demographic, cultural, female autonomy related and contextual factors at the micro level. Therefore, the next chapter analyses behavioral patterns of childbearing and the association between CEB and women's selected characteristics.

CHAPTER SEVEN

Childbearing Practices in Sri Lanka

7.1. Introduction

Having explored fertility levels and trends at the district level in the previous chapter, this chapter examines behavioral patterns of childbearing at the micro level. The chapter starts with a brief introduction to respondent's characteristics. Descriptive statistics are provided on sectoral variations by women's characteristics, differentials in age at first marriage, childbearing preferences, contraceptive behavior and CEB. Finally, OLS regression results which examine the relationship between CEB and women's selected characteristics are presented in four models.

7.2. Characteristics of the Respondents

This section provides demographic and socio-economic characteristics of the respondents that are analyzed throughout the chapter seven. The description of basic characteristics of the respondents are presented in Table 7.1.

Table 7.1: Percentage distribution of sample characteristics

Background characteristic	N	Percentage
Age group		
15-19	229	1.3
20-24	1,439	7.9
25-29	2,656	14.5
30-34	3,602	19.7
35-39	3,927	21.5
40-44	3,259	17.8
45-49	3,190	17.4
Sector of residence		
Urban	2,913	15.9
Rural	14,341	78.4
Estate	1,048	5.7
Religion		
Buddhist	11,577	63.3
Hindu	3,242	17.7
Muslim	1,825	10.0
Roman Catholic	1,365	7.5
Other Christians	293	1.6
Ethnicity		
Sinhala	12,375	67.6
Sri Lanka Tamil	3,658	20.0
Indian Tamil	519	2.8
Muslim	1,697	9.3
Other	53	0.3
Education Level		
Low (up to grade 5)	1,749	9.6
Moderate (passed grade 6-12)	12,201	66.7
High (passed A/L and above)	4,352	23.8
Employment Status		
Employed	5,867	32.1
Not employed	12,435	67.9
Wealth Index		
Lowest	4,295	23.5
Second	3,720	20.3
Middle	3,588	19.6
Fourth	3,501	19.1
Highest	3,198	17.5
Experience of Childbearing		
Ever given a birth	16,492	90.1
Never given a birth	1,810	9.9
Total	18,302	100.0

The responding women were 15 to 49 years of age at the time of the survey. Looking in to age groups, women who belong to the 35 to 39 age group show the highest representation. Nearly

57 percent of the respondents were between the ages of 35 and 49, implying that most of the respondents had completed or nearly completed the process of childbearing.

More than 78 percent of the respondents were selected from rural areas. No more than 16 percent and 6 percent of the respondents consist of urban population and estate populations, respectively.

Nearly 68 percent of respondents were Buddhists. Ethnically, the Sinhalese comprised the great majority of respondents. Thus, similar to the population composition in Sri Lanka, the Sinhalese Buddhist concentration in the sample was emphasized. Moreover, one fifth of the respondents were Sri Lankan Tamils (mostly Hindu) whereas Muslims comprised nearly 10 percent of the study population.

Most women (67%) have attained a moderate education level of passing grade 6 to 12 while one fifth of the sample have reached a high education level by passing advanced level (A/L) examination or above. Reflecting a satisfactory educational achievement among the study population, only 10 percent of the sample had a low level of education up to grade 5. About 68 percent of the women were unemployed, whereas a less than one third of them were employed.

The highest proportion (23.5%) of women belong to the lowest wealth quintile. However, the distributions of women across wealth quintiles were nearly equal. Particularly, the same proportions of women were in the middle and the fourth categories.

The experience of childbearing is very important in analyzing the aspects of childbearing. More than 90 percent of the vast majority of respondents have ever given birth while nearly 10 percent of women have never experienced childbirth by the time of the survey. All in all, this is a large-scale nationally representative sample.

7.3. Descriptive Analysis

Before digging into the statistical analysis, this section provides descriptive statistics related to childbearing practices in Sri Lanka which include percentages, means, medians and standard deviations. Particularly, summary statistics are used to summarize the distribution, behaviors, variations, and differentials of selected variables. Thus, sectoral variations of women's characteristics, age at first marriage, childbearing preferences, contraceptive behavior and CEB are presented assessing special features of women's characteristics and childbearing practices that are examined later in the statistical analysis.

7.3.1. Sectoral Variations by Women's Characteristics

The significant effect of sector of residence in determining practices of childbearing has been widely discussed in the Sri Lankan context (Abeykoon, 2006; Caldwell et al., 1987; Wijesinghe and Siddhisena, 2017; Perera, 2017; De Silva, 1991). In order to provide a better picture of the urban, rural and estate sectors in Sri Lanka, Table 7.2 presents the percentage distribution of selected characteristics of women by sector of residence.

Table 7.2: Percentage distribution of women's characteristics by sector of residence

Variable	Urban (N=2,913)	Rural (N=14,341)	Estate (N=1,048)
Age at first marriage			
Below 20	24.5	33.8	33.8
20-24	37.5	36.0	39.6
25-29	29.0	22.2	20.8
30+	9.0	8.0	5.8
Total	100.0	100.0	100.0
Age at first sexual intercourse			
Below 20	25.9	36.4	35.2
20-24	36.9	34.3	37.8
25-29	28.5	21.5	21.0
30+	8.6	7.7	6.0
Total	100.0	100.0	100.0
Religion			
Buddhist	46.1	70.4	13.0
Hindu	15.0	14.0	76.2
Muslim	21.9	8.2	1.2
Roman Catholic	13.6	6.3	6.6
Other	3.4	1.1	3.1
Total	100.0	100.0	100.0
Ethnicity			
Sinhala	54.9	74.2	13.3
Sri Lanka Tamil	23.1	17.6	44.5
Indian Tamil	0.9	0.5	40.7
Muslim	20.2	7.7	1.0
Other	0.9	0.1	0.7
Total	100.0	100.0	100.0
Education Level			
Low	6.4	8.4	33.8
Moderate	59.3	68.7	60.1
High	34.3	22.9	6.1
Total	100.0	100.0	100.0
Employment			
Professional	10.1	7.8	4.4
Clerical	4.4	2.5	0.3
Services and sales	7.0	4.9	6.9
Agriculture and other	11.4	15.2	40.3
Not employed	67.1	69.6	48.2
Total	100.0	100.0	100.0
Wealth Index			
Lowest	8.2	23.1	71.4
Second	12.3	22.0	20.5
Middle	15.6	21.5	4.9
Fourth	24.6	19.2	2.7
Highest	39.3	14.3	0.6
Total	100.0	100.0	100.0

The age at first marriage is an important demographic characteristic determining the age at which the first pregnancy occurs. It is often used as a proxy for first exposure to intercourse as well as to have had a birth. Women living in urban areas got married relatively later than their rural and estate counterparts. Surprisingly, similar percentages of 33.8 of women from both rural

and estate areas got married before reaching age 20, implying a greater probability of having a teenage pregnancy. Thus, girls who live in rural and estate areas have a greater risk of becoming teenage mothers than their urban peers. However, even in urban areas nearly one fourth of women got married before age 20. Across all regions, most responding women were first married between 20 and 24 years of age. On the other hand, about 38 percent of women in urban areas marry at later ages after age 25, while 30 percent and 27 percent of rural and estate counterparts marry at later ages, respectively. A similar trend was observed with a very short gap between age at first sexual activity and age at first marriage in all three sectors except rural women below age 20. More than 36 percent of women started sexual activities before reaching age 20 though only 34 percent of women were married by the age of 20.

Analyzing the religious composition of three sectors, urban areas constitute of mixed population of all religious groups, though Buddhists are the largest religious community. The Muslim concentration in urban areas were emphasized with 22 percent of Muslim population living in urban areas. More than 70 percent of rural population are Buddhists whereas more than three fourth of estate population comprised of Hindus. Thus Buddhism is the most prevalent religion in both urban and rural areas while Hinduism is the predominant religion in estate sector. As ethno-religious identities are closely interrelated, it shows roughly equal distribution between ethnic and religious composition among three sectors. Both urban and rural areas mainly comprised of Sinhala, Sri Lankan Tamil and Muslim population while Sri Lankan and Indian Tamils represent the majority of population in estate areas.

Education differentials among three sectors are highlighted with the disadvantaged educational achievement among estate women. Nearly 34 percent of estate women had low education level while women with high education are as low as 6 percent. Thus, most estate women had low or moderate education level while both urban and rural women have had moderate or high education level.

The distribution of women's employment categories evident that professional workers are highest (10%) among urban sector while lowest (4%) in estate sector. Similarly, women who engaged in occupations such as clerical, services and sales are also relatively high in urban areas compared to rural and estate areas. Though educational achievements are high in urban and rural areas, nonworking women are also high as nearly 70 percent. Accordingly, women's participation in labor market is relatively low in urban and rural sectors. Despite the low level of education among estate women, non-working women are lowest in estate sector. It implies that estate women are mostly worked on agricultural, plantations not as a choice, but merely to survive.

As a main indicator of economic status of the family, wealth index is also assessed at sector level. Though the general distribution of wealth index (see Table 7.2) among wealth categories were nearly equal, the sectoral breakdown shows how lowest and highest categories are dominated within two sectors. Lowest category is predominantly estate, with nearly more than 70 percent of the poorest (lowest) population living in estate areas, compared to 8 percent and 23 percent of urban and rural population respectively. Moreover, 20 percent of estate population belong to the second category, implying that estate women are often belong to the lowest or the second categories. On the other hand, the wealthiest people are highest in urban areas with nearly 40 percent of the wealthy women (highest) are living in urban areas, compared to only 14 percent and less than 1 percent in rural and estate areas respectively.

7.3.2. Age at First Marriage

Marriage is seen as a prerequisite for having socially accepted sexual relationships and legitimized children in most societies. Socio-cultural values, religious beliefs, traditions and personal values of sexual abstinence before marriage are still admired and encouraged within the social context in Sri Lanka. On the other hand, marriage provides the legal recognition and validity to families. Due to the social recognition and importance of first marriage, remarriages and partnerships are also very rare in Sri Lanka. Only 2 percent of interviewed women had been married or cohabitated more than once.

According to the sample, the mean age at first marriage among women aged 15 to 49 is 22.39 while the median age at first marriage is 22. Being a country with a diverse population, marriage patterns in Sri Lanka vary widely depending on various socio-economic and cultural characteristics of the population. Hence, Table 7.3 presents the characteristics relating to the timing of first marriage.

Table 7.3: Age at first marriage by background characteristics

Characteristic	N	Mean age at first marriage	Standard deviation	Median age at first marriage
Sector				
Urban	2,913	23.18	4.75	23.00
Rural	14,341	22.26	4.92	22.00
Estate	1,048	21.96	4.51	21.00
Religion				
Buddhist	11,577	22.60	4.95	22.00
Hindu	3,242	22.07	4.99	21.00
Muslim	1,825	21.65	4.33	21.00
Roman Catholic	1,365	22.44	4.62	22.00
Other Christians	293	21.87	4.80	21.00
Ethnicity				
Sinhala	12,372	22.60	4.92	22.00
Sri Lanka Tamil	3,658	22.06	4.98	21.00
Indian Tamil	519	22.03	4.66	21.00
Muslim	1,695	21.66	4.28	21.00
Other	53	22.66	5.18	22.00
Education level				
Low	1,749	20.45	4.86	19.00
Moderate	12,201	21.64	4.73	21.00
High	4,352	25.26	4.08	25.00
Employment status				
Employed	5,867	23.27	5.18	23.00
Not employed	12,435	21.97	4.68	21.00
Wealth Index				
Lowest	4,295	21.22	4.88	20.00
Second	3,720	21.75	4.84	21.00
Middle	3,588	22.24	4.91	22.00
Fourth	3,501	22.92	4.76	23.00
Highest	3,198	24.27	4.39	24.00
Total	18,302	22.39	4.88	22.00

As presented in Table 7.3, the first marriages of women in urban areas occur at older ages than their rural and estate counterparts. Thus, urban women tend to marry almost one year later than rural and estate women. Relatively earlier ages at first marriage of estate women indicate that estate women have a relatively longer period of exposure to the risk of childbearing.

Muslim women marry younger than the other women in Sri Lanka. Both mean and median ages of marriage for Buddhists and Roman Catholics show that those women marry at the age of

22. Mean age at first marriage relating to ethnic factor also shows a similar trend, proving that Muslim women marry early, by the age of 21.6. However, there is no much variance in age at first marriage among other ethnic groups.

Education level seems to play an important role in deciding the timing of first marriage in Sri Lanka. Marriage timing appears to increase with the education level. More specifically, women with low levels of education (up to grade 5) got married as early as age 20 while women with high levels of education (passed A/L and above) got married after age 25.

As the education levels increase so do the employment opportunities. Thus, as a result of higher education achievements women tend to find a better employment opportunity. Table 7.3 shows that women's currently working status is also associated with the age at first marriage. Working women, who currently work for pay outside the home got married 1.3 years later than the non-working women. Considering the median age at first marriage, currently working women had first married at age 23, while non-working women had first married two years earlier (21). Despite the fact that women's working status by the time of their first marriage was not known, there is two years difference in the age at first marriage among currently working and non-working women.

The analysis of the wealth quintile reveals that there is a consistent variation in age at first marriage according to the wealth index. The wealth index which implies the current wealth index shows a clear pattern in that the higher the wealth quintile, the higher the age at first marriage. Particularly, considerable differences were observed between the highest and the lowest wealth quintiles. The mean age at first marriage is 24 for women in the highest wealth quintile and 21 for women in the lowest wealth quintile. This implies that the richest women/women who tend to marry richest men in Sri Lanka get married approximately 3 years later than the poorest women.

Given the above findings, it is clear that the magnitude and significance of various background characteristics on the timing of first marriage vary substantially.

7.3.3. Childbearing Preferences

Childbearing preferences are considered as closely associated with childbearing behaviors. Hence, this section assesses childbearing preferences mainly based on ideal number of children. Several other characteristics relating to childbearing preferences are also used to explain the differential childbearing preferences among religious groups in Sri Lanka.

7.3.3.1. Ideal Number of Children

Ideal number of children reflects the women's attitudes towards having children regardless of their current marital status and the current composition of children. Irrespective of their current marital status, respondents who had children were asked about the number of children they would choose to have if they could start afresh. Respondents who had no children were asked about the exact number of children to have in their whole life, if they could have. This allows the respondents to make different choices instead of being confined to their current composition of children. Responses to these questions are summarized in Table 7.4.

Table 7.4: Ideal number of children by background characteristics

Background characteristic	N	Mean ideal number of children	Standard deviation
Age			
15-19	226	2.12	0.81
20-24	1,436	2.26	0.88
25-29	2,643	2.38	0.93
30-34	3,588	2.47	1.03
35-39	3,907	2.60	1.12
40-44	3,232	2.64	1.27
45-49	3,167	2.75	1.41
Sector			
Urban	2,880	2.59	1.20
Rural	14,273	2.54	1.15
Estate	1,046	2.43	1.01
Religion			
Buddhist	11,526	2.46	1.07
Hindu	3,224	2.51	1.13
Muslim	1,811	3.13	1.48
Roman Catholic	1,348	2.49	1.19
Other Christians	290	2.47	1.13
Ethnicity			
Sinhala	12,307	2.46	1.07
Sri Lanka Tamil	3,638	2.55	1.16
Indian Tamil	517	2.44	0.99
Muslim	1,681	3.15	1.51
Other	51	2.35	0.93
Education Level			
Low	1,736	2.79	1.47
Moderate	12,133	2.54	1.15
High	4,330	2.44	0.99
Employment Status			
Employed	5,832	2.53	1.15
Not employed	12,367	2.55	1.15
Wealth Index			
Lowest	4,267	2.57	1.22
Second	3,704	2.55	1.13
Middle	3,573	2.52	1.09
Fourth	3,482	2.53	1.10
Highest	3,173	2.53	1.20
Total	18,199	2.54	1.15

According to Table 7.4, the mean ideal number of children for all women is 2.5. The ideal number of children is lower among younger cohorts compared to older cohorts. The youngest women aged 15 to 19 reported their ideal number of children similar to the replacement level of fertility. The gradual increase in the ideal number of children can be observed with the increasing childbearing ages.

The ideal number of children is highest (2.59) in urban areas. Likewise, the ideal number of children is relatively higher in rural areas (2.54) than in estate areas (2.43). However, the difference is small among women from all three sectors. This implies that without much variation, women in Sri Lanka would prefer to have approximately 2.5 children during their reproductive life span.

Religion seems to be the most influential factor in deciding women's ideal number of children. Muslim women have a significantly higher ideal number of children (3.13), than other women in Sri Lanka. Women in other religious groups consider approximately 2.5 to be the ideal number of children while Buddhist women show the lowest ideal number of children (2.46).

Considering the ethnic differentials, Muslim women answered three or more children is ideal. The difference is small among Sinhala, Sri Lankan Tamil, Indian Tamil and other ethnic categories. Thus, most women who belong to ethnic groups other than Muslim wish to have nearly 2.5 children.

Level of education seems to be an important predictor of the ideal number of children. In particular, there were substantial differences between the highest and the lowest educational categories. Less educated women consider 2.79 children as their ideal, implying that they would have three children if they could revise their reproductive schedule. However, highly educated women rarely say having three children is ideal. The difference of the mean ideal number of children for women with highest and medium level of education is just one single point (2.44 to 2.54).

Interestingly, there is no variation between working women and non-working women regarding their ideal family size. Also, the ideal number of children shows no variation across all wealth quintiles and it has stabilized at 2.5. This suggests that women in Sri Lanka prefer to have more than two children regardless of their working and wealth conditions. As can be seen, only the religious factor makes a substantial difference regarding the ideal number of children. Hence,

the following section analyses childbearing preferences of Muslim women and other women in Sri Lanka.

7.3.3.2. Childbearing Preferences of Muslim and Other Women

Table 7.5 clearly demonstrates that there are considerable differentials relates to ideal number of children among Muslim women and their peers from other religious groups.

Table 7.5: Differential childbearing preferences among Muslim and other women

Characteristic of childbearing preference	Muslim women (N=1,811)	Women from other religious groups (N=16,388)
Ideal number of children		
No children	6.0	4.7
1	2.4	5.1
2	24.2	46.1
3	28.6	31.2
4	25.4	9.5
5+	13.4	3.5
Most suitable age for becoming pregnant		
Below 20	14.1	7.9
20-24	68.5	57.7
25-29	16.8	33.6
30-34	0.6	0.8
35+	0.1	0.1
Most suitable age for last pregnancy		
Less than 24	1.0	0.7
25-29	5.2	6.5
30-34	25.5	28.0
35-39	52.7	54.9
40-44	11.4	7.8
45-49	4.2	2.1
Most suitable birth space		
1 years	1.5	1.4
2 years	27.3	30.0
3 years	37.3	40.8
4 years	11.2	9.8
5 years	17.0	14.2
6 years	5.6	3.8
Total	100.0	100.0

The ideal number of children seems to be relatively high among Muslim women as the majority of women (67.4%) considered three or more children as their ideal compared to just 44 percent among other ethnoreligious groups. The majority of women who belong to other ethnicities and religions prefer to have two or less than two children. Surprisingly, Muslim women who consider no children as their ideal (6%) are also relatively high.

A great majority (69%) of Muslim women and women from other ethnoreligious groups (58%) consider age 20 to 24 as the most suitable age for becoming pregnant. A larger proportion of women (34%) from other ethnic and religious groups expressed that age 25 to 29 is the best age for becoming pregnant. However, a considerable proportion of Muslim women (14%) believed that women should start childbearing as early as before reaching age 20.

The majority of Muslim women as well as women from other ethnoreligious groups consider age 35 to 39 as the most suitable age for the last pregnancy. Implying a preference to stop childbearing at older ages, more than 15 percent of Muslim women believe that age 40 to 49 is the best age to stop childbearing while less than one-in-ten women from other ethnic and religious groups believed age 40 to 49 is the best.

Birth space between births is an important determinant of infant mortality as well as the total number of children. Relatively longer intervals between births decreases the number of children a woman can have. Surprisingly, Muslim women seem to have expressed their intention to have a relatively longer birth interval compared to other women. Particularly, more than one fifth (23%) of Muslim women consider a 5 or 6 year gap between births as ideal compared to just 18 percent of other women.

7.3.4. Contraceptive Behavior

Permitting couples to achieve their desired family size, contraceptive methods play an important role in contemporary societies. Consequently, most couples intend to use various contraceptive methods depending on the period of limiting or spacing. This section discusses women's current use of contraception and most preferred contraceptive source.

7.3.4.1 Current Use of Contraception

Respondents were asked whether they are currently using any birth controlling technique to assess the prevalence of contraception among women in reproductive ages. Table 7.6 presents the percentage distribution of current use of contraception by selected background characteristics.

Table 7.6: Current use of contraception by background characteristics

Background characteristic	N (10,835)	Percentage
Sector		
Urban	1,518	67.5
Rural	8,719	74.0
Estate	598	74.0
Religion		
Buddhist	7,754	77.0
Hindu	1,467	64.3
Muslim	759	62.6
Roman Catholic	67	67.3
Other Christians	66	65.5
Ethnicity		
Sinhala	8,268	76.8
Sri Lanka Tamil	1,525	61.8
Indian Tamil	286	70.8
Muslim	724	63.2
Other	28	66.7
Education level		
Low (up to grade 5)	986	68.8
Moderate (passed grade 6-12)	7,350	73.4
High (passed A/L and above)	2,499	73.7
Employment status		
Employed	3,444	71.3
Not employed	7,391	73.9
Wealth Index		
Lowest	2,361	70.2
Second	2,247	74.2
Middle	2,195	74.4
Fourth	2,102	74.0
Highest	1,930	72.7
Total	10,835	73.0

The percentage distribution of current use of contraception demonstrates several interesting aspects of contraceptive use in Sri Lanka. Surprisingly, a large majority of respondents (74%) residing in both rural and estate settlements were currently using some contraceptive method while only 68 percent of urban women were currently using some contraceptive method.

Current use of contraception was highest among Buddhist respondents. Consistent with the Buddhist women's relatively lower ideal number of children, most Buddhist women were attempting to control their family size. In fact, more than three-quarters of Buddhist women (77%) were using some method of contraception by the time of the survey. Contrarily, responding to the relatively larger ideal family size, Muslim women showed a lower contraceptive use.

Ethnically, a huge proportion of Sinhalese women (77%) were using contraceptive methods while Indian Tamils (71%) also reported a relatively higher contraceptive use. Conversely, low levels of contraceptive use was emphasized among women who belong to Sri Lankan Tamil (62%) and Muslim (63%) ethnic groups.

Level of education seems to be closely associated with contraceptive prevalence among the responding women. Particularly, higher level of education provides women the necessary knowledge of available reproductive options. The current use of contraception showed that the higher the level of education the higher the contraceptive use. Women with moderate or high level of education, reported more than 73 percent higher use of contraception. However, considering the employment status of women, the observed difference between employed and unemployed groups was smaller (2.6%). Interestingly, unemployed women were currently using contraceptive methods little more than employed women.

Contraceptive use was nearly equal in almost all wealth quintiles ranging from 70 to 74 percent. In fact, the second, third and fourth wealth quintiles show an equal distribution.

7.3.4.2. Most Preferred Contraceptive Source

Contraceptive preference reflects the demand for various contraceptive methods. Table 7.7 demonstrates women's most preferred contraceptive method by background characteristics. The data reflect women's desire to use a specific family limitation strategy regardless of the current method.

Table 7.7: The most preferred contraceptive method by background characteristics

Characteristic	N	Sterilization	IUD	Injectable	Implant	Pill	Condom	Withdrawal	Other	None	Total
Age group											
15-19	229	2.6	7.0	12.7	18.3	18.3	2.6	3.9	3.9	30.6	100.0
20-24	1,439	2.0	13.3	21.4	11.6	15.2	6.9	4.2	2.5	22.8	100.0
25-29	2,656	3.8	15.1	21.3	9.3	15.7	10.2	5.4	2.1	16.9	100.0
30-34	3,602	9.9	14.9	20.3	6.5	14.6	9.6	7.0	2.1	15.2	100.0
35-39	3,927	19.8	15.0	16.0	4.3	12.9	7.6	8.2	1.9	14.4	100.0
40-44	3,259	25.6	13.0	13.9	2.2	10.8	6.4	8.8	2.0	17.4	100.0
45-49	3,190	26.4	9.7	11.7	1.2	9.8	5.6	9.8	2.1	23.9	100.0
Sector											
Urban	2,913	13.7	11.5	12.4	4.6	12.5	12.1	8.4	2.8	22.3	100.0
Rural	14,341	15.2	14.2	18.1	5.3	13.3	7.2	7.8	2.0	17.1	100.0
Estate	1,048	35.8	8.8	13.3	6.7	9.9	2.9	2.2	2.1	18.4	100.0
Religion											
Buddhist	11,577	12.7	16.4	17.1	5.7	14.7	8.1	9.5	2.2	13.7	100.0
Hindu	3,242	28.8	8.8	16.7	5.5	8.9	4.3	1.9	1.2	23.8	100.0
Muslim	1,825	12.9	6.3	18.0	2.9	10.5	10.4	4.7	2.2	32.2	100.0
Roman Catholic	1,365	18.1	10.2	14.9	4.3	11.7	8.7	8.6	2.8	20.8	100.0
Other	293	19.5	11.6	14.0	6.1	10.2	7.9	6.5	3.8	20.5	100.0
Ethnicity											
Sinhala	12,372	12.7	16.2	16.8	5.6	14.8	8.3	9.7	2.4	13.7	100.0
Sri Lanka Tamil	3,658	25.5	8.6	18.0	5.1	8.2	5.1	2.2	1.1	26.1	100.0
Indian Tamil	519	40.7	6.7	10.6	7.7	9.3	2.1	2.3	2.3	18.3	100.0
Muslim	1,695	13.3	6.6	17.8	2.7	11.0	10.5	5.1	2.2	30.9	100.0
Other	53	11.3	9.4	5.7	7.6	15.1	17.0	5.7	0.0	28.3	100.0
Education level											
Low	1,749	37.1	8.8	15.9	4.5	6.8	1.6	2.9	1.3	21.2	100.0
Moderate	12,201	15.7	13.4	19.3	6.2	14.0	6.1	6.1	2.0	17.3	100.0
High	4,352	8.8	15.4	10.4	3.2	12.7	14.7	13.5	2.7	18.6	100.0
Employment status											
Employed	5,867	17.5	13.5	13.4	4.0	11.7	8.2	10.0	2.3	19.4	100.0
Not employed	12,435	15.4	13.5	18.5	5.9	13.6	7.5	6.4	2.0	17.3	100.0
Wealth Index											
Lowest	4,295	24.7	11.0	20.5	7.5	10.7	3.1	2.8	1.2	18.6	100.0
Second	3,720	16.6	13.6	19.1	6.4	13.0	5.2	6.1	2.4	17.6	100.0
Middle	3,588	13.2	14.8	18.3	4.9	15.1	6.7	7.3	2.0	17.6	100.0
Fourth	3,501	12.31	13.77	15.77	3.97	14.28	10.08	9.43	2.31	18.08	100.0
Highest	3,198	11.4	14.9	9.1	2.8	12.2	15.3	14.1	2.6	17.7	100.0
Total	**18,302**	**16.1**	**13.5**	**16.9**	**5.3**	**13.0**	**7.7**	**7.6**	**2.1**	**18.0**	**100.0**

Note: Other category includes emergency contraception, lactational amenorrhea method and rhythm method etc.

According to Table 7.7, it is clear that preference for modern contraception is extremely high among women in the reproductive age group. Among a range of contraceptive methods, less than 10 percent of women prefer to use traditional methods even after counting the other category with withdrawal method. The most preferred contraceptive method (17%) was injectable while the preference for sterilization (16%) and IUD (14%) was also relatively high. However, a significant proportion of women in each age group do not prefer to use any method of contraception. Particularly, 31 percent of women aged 15 to 19 did not intend to use any contraceptive method.

The most preferred contraceptive method seems to change with the age of women. The highest proportion of young adults between ages 15 and 19 preferred to use implant or pills

comprising equal percentages (each 18%). Most women between ages 20 and 24 favored the use of injectables. However, the preference for injectable decreased as women got older. It was observed that the preference for sterilization and withdrawal method increased with women's age. Particularly, women aged 35 to 49 reported a greater preference for sterilization.

The preference for sterilization among estate women was emphasized with more than 35 percent of women preferring sterilization. Additionally, injectable was also favored among estate women (18%). Both urban and rural women favored sterilization, IUD, injectable and pills with each method at more than 10 percent. Yet, about 12 percent of women in urban settlements also preferred to use condoms while their rural and estate counterparts represented their unfavorable attitudes towards condoms.

Both religious and ethnic characteristics reflected differentials in contraceptive preference in a similar manner. A range of contraceptive methods were widely used by Sinhalese Buddhist women. Thus, sterilization, IUD, injectable, and the pill were mostly used by Buddhist women with each method at more than 10 percent. Correspondingly, Sinhalese Buddhist women were least likely to prefer non-use of contraception while contraceptive non-use was mostly favored among Muslim women. The preference for traditional methods was also highest among Sinhalese Buddhists. Among Hindu women, preference for sterilization was much higher compared to other religious groups. In the same way, both Indian Tamils (41%) and Sri Lankan Tamils (26%) represented a greater preference for sterilization.

Low educated women mostly preferred sterilization (37%) compared to their counterparts of moderate (16%) and high (9%) educated. Preference for contraceptive non-use was also highest among low educated women. Irrespective of education level, injectable was favored by all women while nearly 20 percent of highest preference was reported from women with moderate education level. Interestingly, the preference for IUD and withdrawal method increases with higher level of education.

Women's employment status and contraceptive preference showed a relatively smaller difference. However, employed women mostly preferred to use sterilization while their unemployed counterparts mostly prefer to use injectable. IUD was equally preferred (14%) by both employed and unemployed women. Nearly 20 percent of both employed and unemployed women were favored in contraceptive non-use. Thus, considerable differentials were not reflected from employed and unemployed sub groups.

Contraceptive preference was mostly similar across wealth quintiles. Particularly, second, middle and fourth categories reflected very similar preference towards contraception. Nevertheless, women who belong to the lowest wealth quintile mostly preferred to use sterilization (25%) and injectable (21%) while women from highest category preferred to use IUD, condom or withdrawal methods.

7.4. CEB (Children Ever Born)

CEB reflects the total number of children at the time of the survey. CEB is heavily dependent on the age of women as young women have not completed their reproductive career. Hence, CEB is presented considering the older women aged 35 to 49.

About 56 percent of the respondents (N=10,376) belong to the older cohort. Considering the women's average age at marriage as a proxy for starting childbearing, it can be assumed that the older cohort is close to completing their reproductive careers. In this respect, the CEB of the older cohort may be close to the lifetime completed fertility.

The mean number of CEB for the older cohort was 2.39. This reflects the fact that more than two children would be born at the later stage of the reproductive career. However, according to women's demographic and socio-economic background, there were considerable differentials in CEB among the older cohort.

Table 7.9: Mean number of children to older cohort by background characteristics

Background characteristic	N	Mean number of children	Standard deviation
Age			
35-39	3,927	2.26	1.07
40-44	3,259	2.45	1.17
45-49	3,190	2.51	1.34
Sector			
Urban	1,677	2.33	1.20
Rural	8,162	2.40	1.19
Estate	537	2.63	1.13
Religion			
Buddhist	6,756	2.21	1.02
Hindu	1,758	2.78	1.38
Muslim	922	2.99	1.52
Roman Catholic	779	2.47	1.21
Other Christians	161	2.53	1.36
Ethnicity			
Sinhala	7,221	2.21	1.02
Sri Lanka Tamil	1,984	2.79	1.39
Indian Tamil	276	2.75	1.24
Muslim	868	3.00	1.52
Other	23	2.00	1.35
Education Level			
Low	1,451	2.98	1.47
Moderate	6,710	2.42	1.15
High	2,215	1.96	0.92
Employment Status			
Employed	3,878	2.29	1.15
Not employed	6,498	2.47	1.21
Wealth Index			
Lowest	2,309	2.85	1.40
Second	2,054	2.45	1.21
Middle	2,004	2.29	1.10
Fourth	1,997	2.21	1.06
Highest	2,012	2.13	0.96
Total	10,376	2.39	1.19

As presented in Table 7.9, women aged 35 to 39 who are near the end of their childbearing years would have 2.26 children compared to 2.45 and 2.51 children for women aged 40 to 44 and 45 to 49, respectively. The relatively higher mean number of children to women in older cohorts implies that most women in the older birth cohorts have completed their reproductive careers.

Women who live in urban areas have fewer children (2.33) compared to their rural (2.40) and estate (2.63) peers. Thus, estate women show the highest number of births implying that they would have nearly three children by the end of their childbearing period.

Ethnic differences may also play a significant role in deciding the total number of CEB in Sri Lanka. Due to the close relationship between ethnic and religious groups, observed ethnic characteristics are also closely related with the religious characteristics. The CEB of older cohort is highest (2.99) among Muslim women while Buddhist women show the lowest (2.21). However, no much variation was observed among minority religious groups. Analyzing the ethnicity, Muslim women would have 2.30 children by the end of their reproductive lifespan while Sinhalese women would have 1.86 children by the end of their childbearing period. Other than the small group of other ethnic groups (N=23), majority Sinhalese women show the lowest number of CEB compared to ethnic minorities in the country.

A higher level of education is associated with a smaller number of children in most societies as educated women are putting off having children until later in their reproductive career. The study found that women with high levels of education have fewer children than women with low levels of education (1.96 to 2.98 respectively). The gap between the highest and the lowest educational subgroups is almost one child.

Differentials in CEB of the older cohort by the value of the wealth index suggest that wealth may be an important factor in explaining fertility levels in Sri Lanka. The mean number of children is noticeably lower for women in the highest category (2.13), while much higher for women in the lowest category (2.85). The difference is small among women in the other three categories of the distribution of wealth quintiles.

7.5. Regression Analysis: Models Explaining Fertility Variations

One of the main research questions of the current study is how women's childbearing patterns are shaped by demographic, cultural, female autonomy related and contextual factors. To answer this question, four models were built based on women's selected characteristics: Model A for

demographic factor of age at first marriage, Model B for cultural factor of religion, Model C for female autonomy related factor of education level and Model D for contextual factor of sector of residence. Table 7.10 shows the means of the covariates of independent variables used in the model.

Table 7.10: Means of the covariates of independent variables for women aged 35 to 49

Variable	Means of the covariates
Birth cohort (controlled varible)	
1978-81	0.304
1974-77	0.203
1970-73	0.245
1967-69	0.248
Model A: Demographic factor	
Age at marriage	
Below 20	0.273
20-24	0.347
25-29	0.255
30+	0.125
Model B: Cultural factor	
Religion	
Buddhist	0.651
Hindu	0.169
Muslim	0.089
Roman Catholic	0.075
Other	0.016
Model C: Female autonomy related factor	
Education level	
Low	0.140
Moderate	0.647
High	0.213
Model D: Contextual factor	
Sector	
Urban	0.162
Rural	0.787
Estate	0.052

The results obtained from the OLS regression analysis that predicts the relationship between selected variables and CEB are summarized in table 7.11.

7.11: Regression results for the relationship between selected variables and CEB for women aged 35 to 49

Variable	Model A		Model B		Model C		Model D	
	Coef.	P >|t|	Coef.	P >|t|	Coef.	P >|t|	Coef.	P >|t|
Birth cohort (controlled varible)								
1978-81	**Ref.**							
1974-77	0.166	0.000	0.177	0.000	0.151	0.000	0.164	0.000
1970-73	0.304	0.000	0.300	0.000	0.266	0.000	0.277	0.000
1967-69	0.346	0.000	0.349	0.000	0.285	0.000	0.312	0.000
Demographic factor								
Age at marriage								
Below 20	**Ref.**							
20-24	-0.469	0.000	-0.446	0.000	-0.411	0.000	-0.406	0.000
25-29	-0.958	0.000	-0.927	0.000	-0.866	0.000	-0.868	0.000
30+	-1.657	0.000	-1.616	0.000	-1.555	0.000	-1.554	0.000
Cultural factor								
Religion								
Buddhist	**Ref.**							
Hindu	–—	–—	0.525	0.000	–—	–—	0.519	0.000
Muslim	–—	–—	0.705	0.000	–—	–—	0.703	0.000
Roman Catholic	–—	–—	0.203	0.000	–—	–—	0.220	0.000
Other	–—	–—	0.290	0.000	–—	–—	0.317	0.000
Female autonomy related factor								
Education level								
Low	**Ref.**							
Moderate	–—	–—	–—	–—	-0.344	0.000	-0.222	0.000
High	–—	–—	–—	–—	-0.441	0.000	-0.262	0.000
Contextual factor								
Sector								
Urban	**Ref.**							
Rural	–—	–—	–—	–—	–—	–—	0.108	0.000
Estate	–—	–—	–—	–—	–—	–—	-0.073	0.190
Constant	2.819	0.000	2.624	0.000	3.106	0.000	2.722	0.000
Number of observations		**10,376**		**10,376**		**10,376**		**10,376**
F	**(6,10,369)**	**444.00**	**(10, 10,365**	**346.77**	**(8, 10,367)**	**356.04**	**(14, 10361)**	**254.77**
Prob > F		**0.0000**		**0.0000**		**0.0000**		**0.0000**
R-squared		**0.2044**		**0.2507**		**0.2155**		**0.2551**

Table 7.11 shows how each model improved the explanatory power of the CEB. Analyzing the coefficient of determination (R^2) associated with each model, the R^2 for Model A (age at marriage) is as high as 0.2044, implying that controlling for birth cohorts, about 20 percent of the variance in CEB can be explained using the single variable of age at marriage. Model B explains about 25 percent of variations (R^2 =0.2507). Though statistically significant, the combined effect of Model C and D doesn't make an improvement in the model (R^2 =0.2551). The above result indicates that cultural factors (Model B) account for 5 percent improvement in the model. Accordingly, it can be suggested that rather than female autonomy related factors and contextual factors (education and sector), women's cultural factor of religion contribute to the explanation

of the variations in CEB among women in Sri Lanka[9]. The predicted CEB for Muslim women is 0.70 units greater compared to Buddhist women's CEB.

As presented in Table 7.11, four models are controlled for birth cohort while birth cohort is highly significant in explaining CEB. As expected, compared to the most recent cohort (1978-81), earlier cohorts are more likely to have higher number of children. Controlling for that, CEB is negatively associated with women's age at marriage. Thus, women marrying later in life are increasingly less likely to have a higher number for CEB, compared to women who married before age 20. On the contrary, women who marry at very young ages are more likely to have higher number of births in their reproductive career.

Controlling for birth cohort, age at marriage (Model A) is found to be the most important variable in predicting CEB. Controlling for Model A, cultural factors (Model B) are also important in explaining CEB. Compared to Buddhist women, women who belongs to other religious groups have significantly higher number of children. Particularly, Muslim religious affiliation is predicted to have relatively higher number of births among other religious affiliations. Controlling for all the factors in Model A and B, Model C shows that there is a highly statistically significant association between women's education and CEB. The higher the level of education, the lower the CEB. Accordingly, women who had moderate and high levels of education had fewer children compared to women with low levels of education.

Finally, with the inclusion of sector of residence (Model D), demographic factor, cultural factor and female autonomy related factor are still strongly statistically significant to predict variations in CEB. Further, Model D reveals a statistically significant association between women living in rural settlements and CEB. Compared to urban women, rural women in Sri Lanka have more children. All the variables involved in the Model D (full model) were strongly statistically significant with a p-value of 0.000 except in the estate sector.

[9] It should be reminded here that female autonomy is measured only by women's educational level due to the endogeneity issue. With better measurement, the result could be different.

7.6. Discussion and Conclusion

This chapter explored the behavioral patterns relating to childbearing based on marriage, childbearing preferences, contraceptive behavior and CEB. A number of selected components related to childbearing, such as marriage, childbearing preferences, contraceptive behavior and CEB were presented using descriptive statistics and cross tabulations. Finally, OLS regression analysis was performed to estimate whether and to what extent those demographic, cultural, female autonomy related and contextual factors are significant in explaining the CEB of older women in Sri Lanka.

The majority of respondents belonged to the 35 to 49 age group, implying that most responding women were around the age of the completion of childbearing. Moreover, rural, Sinhalese, Buddhist, and unemployed women with moderate levels of education were mostly represented in the sample. Likewise, a more equal distribution of respondents across wealth quintiles was highlighted in the study. In this context, an overwhelming majority of respondents had given birth, implying that a vast majority of respondents had already dealt with the actual processes of childbearing.

The mean age at first marriage was 22.39 while the median age at first marriage was 22. Early marriages were identified among Muslim women and women with poor or disadvantaged social status, including estate residence and lower education etc.

The ideal number of children increased with the rising age of women from 2.12 children for teenage women (15-19) to 2.75 children for older women (45-49). This finding is in line with Perera (2017) as she also suggests that women's fertility preferences change when women move to higher age groups. Surprisingly, urban women reported the highest ideal number of children. However, the variation was small among all three sectors, implying that Sri Lankan women prefer to have 2.5 children irrespective of their sector of residence. Religion's impact on deciding women's ideal number of children was emphasized during the current study. Muslim women reported the highest ideal number of children compared to other ethno-religious groups. This

finding is consistent with the finding of Perera (2017) who suggested that Muslim and Tamil women are 4.5 and 1.4 times, respectively, more likely to prefer more children than Sinhalese women based on SLDHS 2006/07.

Moreover, women who had low levels of education had a relatively high (2.8) ideal number of children compared to those who had higher levels of education (2.4). This finding differs from that of Testa (2014) and Fort et al. (2011) who suggest a positive association between women's level of education and fertility intention in Europe. A possible explanation for this relationship is the effect of contextual factors, as the level of development is a major factor which might potentially account for variations in fertility intentions across countries.

The ethnic specific analysis between Muslim women and women from other ethnoreligious groups showed that nearly 70 percent of Muslim women considered three or more children as ideal while only 44 percent of their counterparts considered three or more as ideal. Further, the descriptive analysis suggested that Muslim women prefer to start childbearing at early ages and wish to stop at older ages. Yet, they prefer to have relatively longer birth intervals compared to women from other ethnoreligious groups. The preference for long birth intervals among Muslim women may be associated with the increased childbearing and rearing burden due to the relatively large number of children.

Current use of contraception was highest among women from rural and estate settlements. Further, contraceptive usage was highest among Sinhalese Buddhist women while Muslim and Sri Lankan Tamil women reported the lowest. The current use of contraception appeared to show a direct relationship with level of education: the higher the level of education the higher the contraceptive use. Interestingly, it was found that unemployed women have adopted contraceptive methods little more than employed women. Contraceptive use showed an approximately equal distribution across all wealth quintiles (70%-74%).

Preference for modern contraception was extremely high with less than 10 percent of women preferring to use traditional methods. Thus, most women prefer to use effective contraceptive

methods of injectable, sterilization and IUD. However, a significant proportion of women, mostly the teenage women, preferred to practice contraceptive non-use. It was noticed that the contraceptive preference is subject to change with the age of women. Young adults favored implants and pills while the 20 to 24 age group favored the use of injectables. Likewise, the preference for sterilization and withdrawal method increased with women's age.

The preferred contraceptive solution of sterilization among estate women (35%) was emphasized in the present study. Both modern (sterilization, IUD, injectable, and pill) and traditional methods (withdrawal method) were widely used by Sinhalese Buddhist women. Among Hindu women who are ethnically Indian Tamil (41%) and Sri Lankan Tamils (26%) a great preference for sterilization was demonstrated. Moreover, education differentials in contraceptive preference were observed. Women with low levels of education mostly preferred sterilization (37%) while well educated women preferred to use the non-hormonal method of IUD and withdrawal method. However, contraceptive preference showed a relatively small difference on behalf of employment status and wealth quintiles.

Regression analysis was conducted to test the variations in CEB considering four older cohorts those born during 1967 to 1981 period. Controlling for birth cohort, age at marriage was identified as the strongest variable in predicting CEB (R^2 =0.20). Interestingly, regression results suggested that women's cultural factors contribute to the explanation of the variations in CEB, rather than female autonomy related factors and contextual factors.

As can be expected, earlier cohorts have more children compared to the latest cohort while CEB is negatively correlated with women's age at marriage. Thus, the higher the age at marriage, the lower the number of CEB, and vice versa. This is consistent with findings in Dommaraju (2008), Acharya (2010), Haloi (2014) Solanke (2015) and Sathar and Kiani (1998) who suggest that women who marry early have relatively higher number of children.

Religious composition was strongly statistically significant in explaining CEB. The results suggest that all other religious groups are more likely to have more children compared to Buddhist

women. In consonance with Adhikari (2010), Muslim women were predicted to have higher number of children as compared with their counterparts in all other religious groups. There are several possible explanations for this result as discussed in childbearing preferences of Islamic and other women. Accordingly, it seems possible that this result is due to Muslim women's relatively high ideal number of children, preference for marriage/childbearing at an early age and preference to stop childbearing at older ages. Other possible explanations can be restrictions for contraception and Muslim's marriage law which allows child marriages.

Education is identified as a significant predictor of fertility during the current study. According to the findings, women who had high levels of education were more likely to have fewer number of children compared to women with low levels of education. This may be due to the fact that educated women are generally autonomous and well aware of the available reproductive options. A number of studies revealed that better educated women are more likely to pursue careers and consequently postpone having children than less educated women (Kim, 2016; Mills et al., 2011; Solanke, 2015; Heaton et al., 1999; Schoen et al., 1999; Broeck and Maertens, 2014). Further, Morgan & Rackin (2010) also showed that well educated women are more likely to have fewer children than they had initially intended. Infecundity with age, which may result in involuntary childlessness, repeated postponements to competing career related activities, and lack of marriageable partner are the responsible factors for this correlation. In the Sri Lankan context, Perera (2017) also stated that lower educated women are more likely to have a higher number of children than their counterparts with higher levels of education.

Another important finding was that women living in rural settlements possess a statistically significant associations with CEB implying that rural women have more children compared to urban women. This finding corroborates the idea of Adhikari (2010), who suggested that rural women have higher fertility than urban women. However, his argument in relation to low urban fertility and high contraceptive use does not support for Sri Lankan context as contraceptive use in rural areas (74%) were even higher than the urban areas (68%) in Sri Lanka.

The above findings suggest that women's demographic, cultural, female autonomy related and contextual factors can be effectively used in explaining the CEB of women in Sri Lanka.

7.7. Summary

This chapter analyzed childbearing associated behavioral patterns in Sri Lanka based on age at marriage, childbearing preferences, contraceptive behavior and CEB. Descriptive statistics were used to present distribution and differentials among population sub groups. OLS regression showed that demographic, cultural, female autonomy related and contextual factors are strongly related to CEB. One unanticipating finding was that women's cultural factors contribute to the prediction of CEB, rather than female autonomy related factors and contextual factors. Without confined to micro level analysis, the next chapter intends to expand the knowledge relating to childbearing in Sri Lanka by integrating the experiences, interventions and perceptions of PHMs as the grassroots level health care providers.

CHAPTER EIGHT

The Role and Perceptions of PHMs in Childbearing Practices: A Sector Based Approach

8.1. Introduction

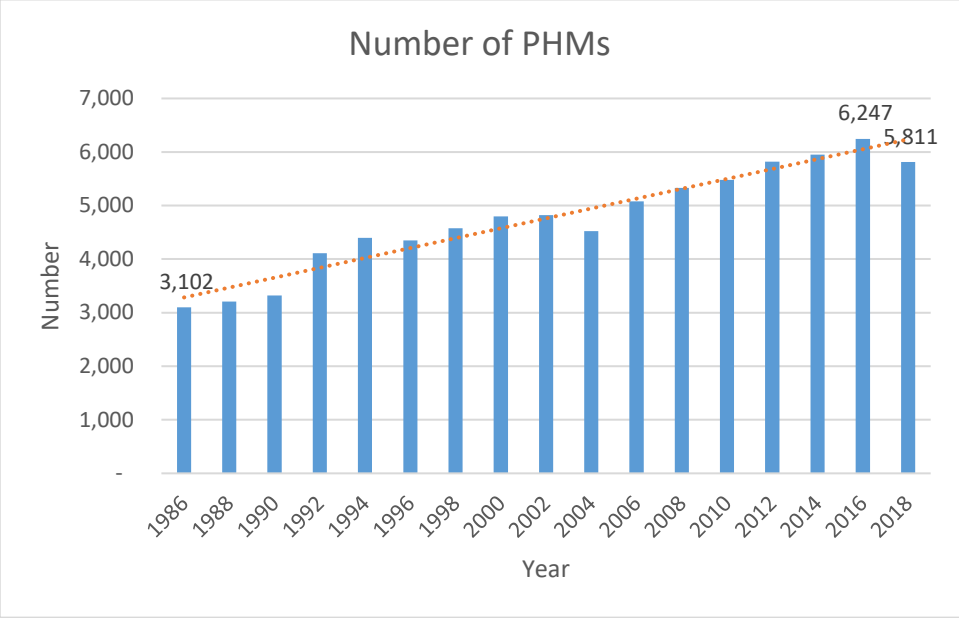
By providing high quality maternal and child health care, reproductive health knowledge and relevant services at the community level, Public Health Midwives (PHMs) provide a vital contribution in ensuring safe motherhood in Sri Lanka. Due to the success story of maternal and child health which have been considered to be greatly associated with the pivotal role of PHMs, this chapter analyzes the role and perceptions of PHMs in childbearing practices, focusing on urban, rural and estate sectors in Sri Lanka. First, descriptive statistics are presented on PHMs role in improving maternal and child health in Sri Lanka based on SLDHS 2016. Second, a qualitative analysis is provided on sectoral characteristics of PHMs working areas, PHMs' training and services, PHMs' perceived fertility preferences, PHMs' perceived contraceptive behavior for women and PHMs' perceived support from family members in childbearing and childcaring.

8.2. Development of Midwifery System in Sri Lanka

PHMs in Sri Lanka provide essential maternal and child health care services for mothers and children from the beginning of the twentieth century. As the establishment and evolvement of midwifery services briefed in chapter 2, this section presents a more complete picture of the current midwifery system integrated into the national health care system in Sri Lanka.

Figure 8.1 shows the number of midwives working in Sri Lanka from 1986 to 2018. Despite minor fluctuations, the number of PHMs rose from 3,102 to more than 6,247 in 2016, the highest number recorded since 1986.

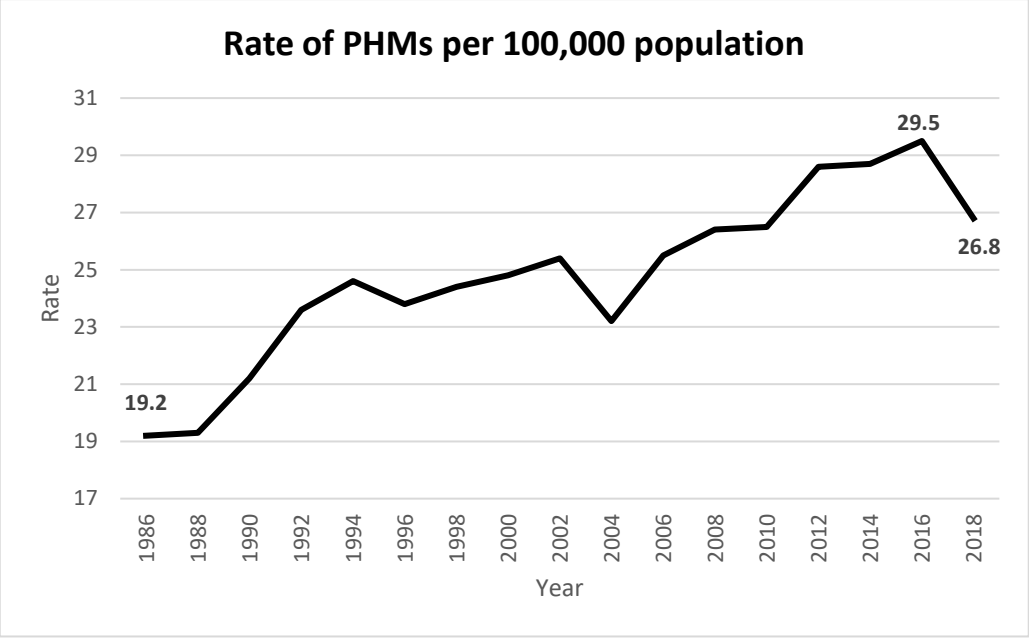
Figure 8.1: Number of PHMs, 1986-2018



Source: Ministry of Health and indigenous medical services, 2020.

As shown in figure 8.1, the gradual increase of number of PHMs evident that the growing need and demand for midwifery services in Sri Lanka over time.

Figure 8.2: Rate of PHMs per 100,000 population



Source: Ministry of Health and indigenous medical services, 2020.

The rate of PHMs also showed a similar trend. Accordingly, the rate of PHMs per 100,000 population have increased from 19.2 in 1986 to 29.5 in 2016 (see Figure 8.2).

Table 8.1 shows the number of PHMs per 100,000 population in districts of Sri Lanka. The rate in the general population is 28.4 per 100,000 population. The data suggest that more advanced districts have less number of PHMs compared to less advanced districts. War affected Mannar, Mullativu and Killinochchi districts found to have relatively higher number of PHMs compared to other districts. On the other hand, Moneragala, where it is considered as the poorest district in Sri Lanka is also reported to have more than 40 percent of PHMs per 100,000 population. Additionally, this unequal distribution may be responsive to the population density, land area and proportion of women in reproductive age.

Table 8.1: Number of PHMs in Districts of Sri Lanka in 2018

District	Population	Number of PHMs	Supervising Public Health Midwives/Public Health Midwives per 100,000 population
Colombo	2,439,000	457	18.7
Gampaha	2,409,000	483	20.0
Kalutara	1,281,000	388	30.3
Kandy	1,468,000	440	30.0
Matale	519,000	170	32.8
Nuwara Eliya	763,000	277	36.3
Galle	1,124,000	328	29.2
Matara	858,000	274	31.9
Hambantota	655,000	218	33.3
Jaffna	613,000	157	25.6
Mannar	109,000	62	56.9
Vavuniya	187,000	60	32.1
Mullaitivu	96,000	48	50.0
Killinochchi	126,000	65	51.6
Batticaloa	570,000	164	28.8
Ampara	719,000	282	39.2
Trincomalee	421,000	153	36.3
Kurunegala	1,711,000	420	24.5
Puttalam	825,000	195	23.6
Anuradhapura	930,000	255	27.4
Polonnaruwa	436,000	139	31.9
Badulla	873,000	321	36.8
Moneragala	491,000	200	40.7
Ratnapura	1,163,000	353	30.4
Kegalle	884,000	249	28.2
Sri Lanka	**21,670,000**	**6,158**	**28.4**

Source: Ministry of Health and indigenous medical services, 2020.

8.3. PHMs Contribution in Maternal Care

This section explores how PHMs actual contribution and relevant service delivery from the viewpoint of women in reproductive ages. Tables 8.2 and 8.3 were created based on micro data from SLDHS 2016. PHMs antenatal care delivery was assessed considering pregnancy registration coverage, timing of registration, mother's attendance at PHMs clinic during pregnancy, postnatal visits by PHM, mother's attendance at PHMs clinic within one month from delivery and making women aware of hospital services etc.

Table 8.2: Prenatal and postnatal service delivery by PHMs

PHMs Contibution in childbearing practices	Urban	Rural	Estate	Total
Pregnancy registration by PHM	96.3	99.5	99.8	99.0
Timing of registration by PHM				
Within 8 weeks of pregnancy	79.3	81.8	67.0	80.5
Within 9-12 weeks of pregnancy	12.3	11.8	18.0	12.3
Within 13-19 weeks of pregnancy	4.2	2.8	4.6	3.1
More than 20 weeks of pregnancy	2.3	2.0	3.9	2.2
Don't know	1.9	1.6	6.5	2.0
Total	100.0	100.0	100.0	100.0
Mean number of weeks at the timing of registration	7.19	7.0	7.4	7.1
Number of women	1091	5523	433	7047
Mean number of mother's visits to clinics at PHMs office during pregnancy	6.7	7.5	6.8	7.3
Number of women	1133	5551	434	7118
Postnatal visits by PHM	94.0	95.8	94.0	95.4
Mothers attendence at PHM clinic within 1 month from delivery	77.3	77.8	81.8	78.0
Number of women	1146	5595	446	7187
Women make aware of the hospital services etc.	90.5	93.3	85.2	92.4
Number of women	1077	5358	419	6854

Note: The table was created considering only the most recent birth occurred during the five year period from 2011 to 2016.

Source: Department of Census and Statistics, 2017.

Adequate antenatal care is considered as the most effective way to reduce pregnancy complications and adverse birth outcomes. Hence, health professionals recommend that the first antenatal visit should occur within the first three months of pregnancy and continue on a monthly basis through the 28th week of pregnancy and every two weeks up to the 36th week (or until birth) (Department of Census and Statistics, 2009). This section assesses whether to what extent PHMs provide prenatal and postnatal maternal care by residential sector.

PHMs prenatal service delivery is highly satisfactory that about 99 percent of pregnancies were registered by PHM in all three sectors. The coverage is particularly impressive in both rural and estate sectors where health care resources are inherently scarce. Analyzing the timing of pregnancy registration by PHM, 79 percent and 82 percent of pregnancies were registered within

the eighth weeks of pregnancy while only 67 percent of estate women were registered. As recommended by health professionals, 92 percent of urban women, 94 percent of rural women and 85 percent of estate women were registered their pregnancy within the twelve weeks of pregnancy. Thus compared to estate mothers, both urban and rural mothers were well covered by PHMs. The mean duration of pregnancy at the time of registration by PHMs was seven weeks in all three sectors. It implies that PHMs are effectively providing their services in all three sectors by registering and initiating antenatal care during the first trimester of pregnancy.

Once registered at PHMs office, mothers are advised to attend clinics at PHMs office. Rural women tend to visit PHMs office more often (7.5 times) than urban (6.7 times) and estate (6.8 times) women. Further, more than 95 percent of women have received postnatal care by PHMs. The distribution is nearly equal in all three sectors. Even exceeding the urban and rural sectors, most impressively, estate mother's attendance at PHMs clinic within one month from delivery is as high as 82 percent.

Moreover, about 93 percent of women were made aware of the services provided by the hospital after childbirth and safety procedures in case of emergency. However, estate women were less aware of such services (85%) compared to urban (91%) and rural (93%) women.

Table 8.3 shows how PHMs involved in family planning decision-making considering young and older cohorts. The data reveals that PHMs are substantially involved in initiating a contraceptive method rather than involving to decide current contraceptive method. Old estate women's contraceptive decisions were substantially made by PHMs (16%), compared to urban (8%) and rural (10%) old women. 12 percent of young estate women's contraceptive initiation decision was made by PHMs while the relevant figures were relatively low in urban(6%) and rural (8) areas. Moreover, only estate PHMs seem to considerably involve in making decision on current contraceptive method. Thus, 8 percent of young women's and 11 percent of old women's current contraceptive methods were decided by PHMs.

Table 8.3: Young and old women's contraceptive decision making by sector

Women's contraceptive autonomy	Urban				Rural				Estate			
	Young		Old		Young		Old		Young		Old	
Initial method	N	%	N	%	N	%	N	%	N	%	N	%
Own decision/both	793	64.2	1,037	67.4	4,336	70.2	5,366	71.4	290	56.8	299	60.3
Husband/partner decision	57	4.6	73	4.7	268	4.3	322	4.3	35	6.9	31	6.3
PHMs decision	76	6.2	120	7.8	482	7.8	761	10.1	60	11.7	80	16.1
Other	14	1.1	31	2.0	52	0.8	70	0.9	1	0.2	5	1.0
Not using	296	24.0	278	18.1	1,041	16.9	996	13.3	125	24.5	81	16.3
Total	1,236	100.0	1,539	100.0	6,179	100.0	7,515	100.0	511	100.0	496	100.0
Current method												
Own decision/both	516	41.8	707	45.9	3,156	51.1	4,102	54.6	207	40.5	229	46.2
Husband/partner decision	36	2.9	59	3.8	133	2.2	189	2.5	20	3.9	16	3.2
PHMs decision	36	2.9	44	2.9	265	4.3	355	4.7	39	7.6	55	11.1
Other	7	0.6	34	2.2	25	0.4	77	1.0	-	-	7	1.4
Not using	641	51.9	695	45.2	2,600	42.1	2,792	37.2	245	48.0	189	38.1
Total	1,236	100.0	1,539	100.0	6,179	100.0	7,515	100.0	511	100.0	496	100.0

Note: Women aged 15-34 years were considered as young and women aged 35-39 years were considered as old.

Source: Department of Census and Statistics, 2017.

Overall, above data suggest that PHMs are the ground level antenatal care providers which assisting women to maintain healthy childbearing practices. Although women were regularly examined by doctors, PHMs are the domiciliary care providers who monitor the pregnancy and reproductive career of women at the community level. Though there were significant variations in service delivery, there have been undoubted benefits for married women in all three sectors through midwifery services. Accordingly, midwives' commitment to delivering the high quality maternity care lead to a sustained substantial improvements in health care in Sri Lanka. Therefore, the following section is devoted to qualitatively assess the role and perceptions of PHMs in childbearing practices from viewpoint of PHMs.

8.4. Sectoral Characteristics of PHMs' Working Areas

As perceived by urban PHMs, socio-economic conditions as well as health and living conditions were significantly higher among the urban population compared to rural and estate populations. According to estate PHMs, estate women had relatively lower educational attainments, such as achieving primary or secondary education. In contrast, most urban and rural PHMs revealed that women in their working areas had passed the Advanced Level (A/L)

examination and Ordinary Level (O/L) examination, respectively. Corresponding to the level of education, estate women's reproductive health knowledge was also fair or poor. Contrarily, urban women had a very good or good reproductive health knowledge while rural women had good or fair knowledge.

It is important for PHMs to build strong relationships with mothers in their working areas. All the interviewed PHMs were able to maintain a healthy relationship with the mothers in their working areas. However, it was revealed that the relationships of PHMs with mothers are subject to change by the sector. Most estate mothers and rural low income mothers were mostly dependent on PHM services as PHMs offer maternal and child care free of charge. Hence, rural and estate PHMs were able to develop strong relationships with mothers while urban PHMs had faced various issues in interacting with employed mothers and mothers who were receiving maternal and child care from the private sector.

8.5. PHMs' Training and Services

The perceptions and experiences of PHMs on women's childbearing practices may differ widely depending on their service period. In the current study, the service period of interviewed PHMs ranged from 4 months to 36 years, while most PHMs had more than 10 years working experience in their current working area. Regardless of the service period, all the interviewed PHMs had completed one year of institutional training followed by a field training period of six months.

The following section describes the scope of services offered by PHMs, based on the responses and discussions in interviews. As most PHMs told us, because their work is especially designed to be provided at the domiciliary level, they are able to provide a smooth flow of services in community-based settings. In fact, PHMs closely interact with mothers at their usual residence and this allows them to realize the mother's socio-economic background and other household level issues.

Each PHM is in possession of an eligible couple register which is compiled on her own after conducting a survey within her working area. Thus, PHMs keep records on all married and unmarried women below age 49 who live with a husband or a partner by visiting such homes once every six months. PHMs are very concerned about marriages in the area and soon after learning about a marriage, a PHM visits the household. During the visit, the PHM discusses family planning intentions and suitable methods with the couple, provides preconception counselling while guiding the couple to participate in pre-conception care sessions which are usually held at the MOH office. Further, the PHM provides nutrition advice to women in order to maintain an optimum level of body mass index (BMI) and supply necessary vitamins such as folic acid. In the case of a PHM meeting a sub fertile couple who are seeking treatments, the couple is referred to a subfertility clinic. Accordingly, PHMs provide a wide range of pre-conception care to newly married couples.

Almost all the PHMs held attitudes on childbearing that were flexible without encouraging or discouraging childbirth. In fact, PHMs assist couples to plan their desired family size depending on fertility preferences, economic and health conditions.

Once a woman gets pregnant, she is required to inform the PHM of her pregnancy immediately (within 8 weeks of pregnancy). As a rule, pregnant mothers should be registered at their usual place of residence to help identify unsafe or vulnerable situations occurring within the household. After registering, pregnant mothers are soon referred to the area antenatal clinic for basic medical tests and vaccinations. After that, pregnant mothers should regularly attend the area clinic twice a month. At the same time, PHMs make prenatal home visits at least once every three months. Depending on the nature of the pregnancy and the mother's health, all pregnancies are categorized as normal or high-risk pregnancies. High-risk mothers are referred to specialized doctors and hospitals while PHMs make more frequent home visits. Moreover, PHMs distribute two packets (each 750 grams) of Thriposha (nutritious soya-based flour mix for supplementary food) to all pregnant mothers throughout the pregnancy and until six months from delivery.

Likewise, they assist all pregnant mothers to get “Poshana Malla” (10 nutritious food vouchers, each valued at Rs.2000, provided all at once to be used within the last six months of pregnancy and the early months of lactation) from the third month of pregnancy.

After delivering a baby, the mother or a family member need to inform the relevant PHM of the birth. The PHM is obliged to visit the baby and the mother within 5 days of leaving the hospital. After three additional visits within 10 days, 14 to 21 days and 42 days, monthly visits are conducted. Thus, PHMs provide essential care during pregnancy and the postpartum period. This is emphasized in the words of an urban PHM:

“I think the PHMs’ service is very important, especially after a child delivery. Some new mothers (first-time mothers) are unaware of health issues of the baby. In case of a complication of the newborn baby, some mothers use home remedies depending on an elder’s advice and myths. Recently, during my field visit, I met two such families. In both cases, I found that the infant was with serious symptoms, but parents were doing just home remedies. I asked parents to take the baby to the hospital immediately. As soon as the two infants were hospitalized, they were transferred to the Intensive Care Unit (ICU). Especially, new mothers living with parents or in laws face such problems very often as they have limited decision making power” (Interviewee number 1).

The statement above reveals the sort of PHM role which can prevent infant deaths. In general, much attention is given to the newborn after the delivery. The growth of infants and children is properly assessed and monitored under the supervision of the PHM. If a baby is within the low birth weight range when he or she completes six months, Thriposha will be given to the baby. Children should be weighed monthly by the PHM until the baby has passed 24 months from birth. After completing 24 months, children should be weighed once every three months. If the baby continues to be within the low weight range, the baby should be continuously weighted monthly and Thriposha will be given until the baby completes the age of five. For all the households with a child less than five years of age, PHMs make home visits at least once in six months. Moreover,

PHMs provide a variety of health care services including vaccinations and guiding mothers to introduce complementary foods.

After 35 years of age, mothers are referred to the well women clinics at the MOH for special screenings such as Pap smear test, breast abnormalities and cervical abnormalities. Thus, PHM services in Sri Lanka are spread over a convincingly longer period of a woman's life. The services described above are provided by PHMs in all three sectors to satisfy mothers and children's health needs, though the demand for services varies by sector.

The current study also revealed several issues and challenges faced by PHMs in healthcare delivery. As described by both rural and estate PHMs, the most demanding services in their working areas were the distribution of contraceptive methods and related counselling. However, urban PHMs did not experience such a demand for contraceptive services whereas several issues related to service delivery were identified. Especially, most urban women are employed and so leave their children with grandparents or servants. Therefore, making a relationship or communication with mothers through grandparents or servants was a great challenge faced by urban PHMs. Likewise, most urban women are not dependent on PHMs or government free health facilities. Instead, urban women tend to seek maternal and child care facilities from the private sector as the majority of urban families are economically empowered. However, in a worst-case scenario, urban PHMs made efforts to maintain at least maternal and child health records on behalf of service delivery.

As can be seen, PHMs do not have a proper system to recognize newly married women or women currently in relationships within the working area. Therefore, their strategies were primary methods such as asking villagers and getting information through the marriage registrar in the area. Having a proper system would strengthen their service delivery.

8.6. PHMs' Perceived Fertility Preferences

As perceived by urban PHMs, recently, the number of children in a family has been increasing in most urban areas compared to previous decades. According to the view of urban PHMs, earlier,

there was a strong two-child family norm in the society. However, the majority of urban women now desire to have up to three children when they have a good income and motivational influence from the family and PHM. In contrast, rural PHMs perceived that the number of children in their working areas was decreasing from more than 4 children per woman to fewer than 3 children per woman. Similarly, estate PHMs also perceived a decline in the number of births from 5 or more births to 3 or 4 births per woman. Irrespective of sector, all the PHMs agreed that poor families often wish to limit births compared to wealthy families.

As observed by rural PHMs, most women have a greater intention to limit childbearing. The leading factors were child care and employment related dual role issues, the belief that many children can cause a great deal of stress, suffering and life problems, high parental expectations on children's future and economic problems. Similarly, estate women also tend to limit births due to economic and child care issues.

"All the estate families have to work in the estate without any choice. Therefore, child care is a very big issue for them when they have more children. Also, the cost for children's education is also an unbearable burden for most families" (Interviewee number 15).

Most PHMs perceived no son or daughter preference in their working areas. Rarely, both rural and urban PHMs perceived that some parents prefer sons over daughters. However, even such families did not stand against female births and did not pressure mothers to have abortions. Surprisingly, daughter preference is also emphasized by two PHMs working in rural areas. One of them was working for a Muslim majority and she expressed her experiences of daughter preference among the Muslim population as follows:

"I think compared to the past, nowadays Muslims like girls. The reason might be girls marry early and have more children. I have felt like most families love their daughters more than their sons. But every family needs a boy too. Specially, as Muslim girls are allowed to use gold, they wear a lots of gold jewelry. Within seven days after the birth of a girl, a necklace, piercing and all other sorts of gold jewelry are worn. Most mothers say that they can use fine dresses and gold jewelry

for a girl to make her look beautiful. Normally, Muslim girls are stylish until they reach 10 to 12 and just after puberty they became less fashionable. But there are no such things for boys." (Interviewee number 8).

Accordingly, this PHM believed that most Muslim families desire at least one son to continue their family line while most families prefer to have more daughters than sons. Even though young Muslim girls are less stylish and typically wear black abaya with hijab that cover head-to-toe, small girls are allowed to be stylish until they attain puberty. Further, interviewee number 8 shared an interesting story on the Muslim marriage and dowry system which is still very common and important within the Muslim society.

"Most girls are married off by the ages of 16, 17 or 18. If a girl gets married at 24 or 25 probably she is well educated, up to university level. At the time of marriage registration, it is necessary to write detailed information on the dowry. Only then, the bride will be entitled for a return of the dowry in case of divorce. As Muslim parents have to give at least 12 pounds of gold with the dowry, poor families are helped by relatives or wealthy neighbors in the village" (Interviewee number 8).

As she further described, according to a custom among Muslim people, parents shave their newborns hair completely off. At the same time, gold, which is of similar weight to the newborn's hair is distributed among poor families by wealthy families. Such practices help poor families to save up for their daughter's dowry and reduce the burden of a girl. Accordingly, the above facts were identified as the main factors of daughter preference among Muslims.

8.7. PHMs' Perceived Contraceptive Behavior of Women

As described by all the PHMs, most births in their working areas are planned. Even if a woman conceives soon after marriage, or soon after the first birth, most of such mothers are likely to accept and describe the pregnancy as a planned one. Therefore, unplanned pregnancies for the first and the second births are very rare in both urban and rural areas. Hence, PHMs perceived

that most unplanned pregnancies are reported from the third birth. In contrast, there is a high risk of reporting unplanned pregnancies for the second and the third births in the estate sector.

As observed by PHMs, women's attention for birth spacing prior to the first birth was good in urban areas while rural women gave it very good attention. Both urban and rural women had a desire to keep a significant gap between marriage and the first birth using contraceptive pills. This behavior was not prevalent among estate women as they rarely use contraception before the first birth.

After the first birth, both urban and rural women use several contraceptive methods such as condoms, IUDs (loop), Jadelle or Depo-Provera (injections). After the last birth, most urban and rural women tend to use IUDs and Jadelle. Additionally, rural women are more likely to choose LRT (female sterilization/ tubectomy) due to the side effects of other temporary methods. However, urban women are less likely to choose LRT. In contrast, estate women were mostly dependent on Depo-Provera even after completing their families. An estate PHM summarized her perspective in the following way:

"Most women prefer to choose LRT after completing the family. But they don't have facilities nearby and now it takes at least two days for LRT. Earlier, FHB provided a one-day LRT facility and a group of women were sent to the FHB by a special bus. After stopping the program, women have to spend two days to make an appointment and surgery at the FHB. As they are unable to spend two days without income, still women are asking about the one-day LRT program" (Interviewee number 16).

Thus, there are many barriers for estate women to obtain their desired LRT as there are no facilities and no paid leaves for the purpose. Additionally, having more children and limited support from family members were identified as common issues for women trying to access their preferred family planning method in rural and estate areas. As described by a rural PHM,

"One mother aged 42, with five children was unable to access her desired family planning method for a long time. After her third birth, she wanted to have sterilization done. I also motivated her

to do so. However, her work load within the family didn't allow her to get sterilization. Since then, she delivered two unwanted births and she will have to bear more unwanted births in the future too" (Interviewee number 6).

As perceived by PHMs, both urban and rural women have substantial power and authority to use their desired contraceptive method. Before choosing a method, women often discuss with their husbands. Although it is very rare, in case the husband disagrees with the desired contraceptive method, women are more likely to give up the idea of using that method. Estate PHMs also agreed that estate women have the power to use their desired contraceptive method while describing some limitations. "Estate couples' communication on family planning is very low. As husbands don't care about such things seriously, women have the power. But they rarely get any support from husbands" (Interviewee number 16).

Accordingly, poor spousal communication and lack of access to contraceptive methods were identified as key issues relating to effective use of contraceptives in rural and estate sectors.

8.8. PHMs' Perceived Support from Family Members in Childbearing and Childcaring

Father's contribution in pregnancy, labor and child care is a decisive factor in the well-being of both mother and child. Though the biological mother automatically has parental responsibility, both mothers and fathers need to share responsibilities as a parent. Even though fathers are more involved in parenting matters recently, there are still attitudes which act as barriers for the maximum performance of fathers.

Urban women seem to have more advantages regarding their husband's support in childbearing and child care as they were more likely to report having very good support. As mentioned by urban PHMs, sometimes they were also impressed to see the commitment and involvement of fathers. For instance, when the mother or baby had a complication, some fathers contact the midwife by themselves and seek solutions. After the delivery, fathers are willing to support the mothers by doing laundry and cooking, etc.

Rural PHMs also perceived that women have good support from fathers while estate PHMs perceived minimal support. Estate PHMs indicated that the majority of estate fathers were less educated and their social knowledge was very poor. On the contrary, the lion's share of their daily income was spent on alcohol and drugs as most of them were addicted to drinking and drugs.

Both urban and rural PHMs stated that women have benefited from the good support in childbearing and child care provided by extended family members which includes in-laws. Even though most women are employed in urban areas, grandparents or family members looked after their children. Otherwise, urban mothers try to have grandparents at home with the assistance of a servant. As observed by PHMs very limited urban and rural mothers truly rely on a servant alone. Proving to have very disadvantaged backgrounds, estate women often receive minimal support from family members in childbearing and care. In fact, all the members of estate families continue working in the estate as far as they are physically able to work since it is their only income.

As perceived by PHMs working in all three sectors, child care was the main challenge for most employed women. All the urban PHMs revealed having sufficient day care facilities around their working areas while rural PHMs reported they had limited or no day care facilities. Irrespective of sector, all the PHMs perceived that most mothers rarely rely on day care facilities. According to a rural PHM, "Nowadays, it's really difficult to find a nanny. Most mothers avoid getting pregnant due to child care issues. There are some day care facilities in the area. But mothers don't rely on such facilities. Mothers choose day care centers as the last option" (Interviewee number 10).

As pointed out by an estate PHM, the estate had provided day care facilities for working mothers. "The estate helps pay for day care, about Rs.1000 per month. Though security is good at the day care center, facilities are very poor and dirty" (Interviewee number 16). Accordingly, the aim of day care facilities in estates was not welfare but the need of the mother's labor. As a

result, childcare service providers in estates just care for physical security by neglecting physical facilities, cleanliness and children's development needs.

8.9. Discussion and Conclusion

This qualitative analysis of PHMs was conducted to explore the perceptions and the role of midwifery care in childbearing practices in Sri Lanka. The analysis revealed PHMs role at the community level and several important aspects of childbearing practices from the perspective of PHMs.

Regardless of their service period, all PHMs have completed one and half years of training. Due to the core and expanded role of PHMs working in all three sectors, women receive pregnancy and postpartum care, child care services and family planning services free of charge throughout their reproductive life span.

The current study revealed that estate women are disadvantaged in educational achievements compared to urban and rural women. Liyanage (2013) also stated that junior secondary enrollment of students is lowest in the estate sector. Accordingly, estate women have limited opportunities for social mobility. Hence, children of estate families are more likely to be employed in the same estate with an intergenerational transfer of poverty. Likewise, PHMs perceived that the women who live in rural and estate areas had a lack of reproductive health knowledge.

Despite the number of children in a family decreasing in the country, some urban PHMs perceived an increasing trend in family size when families have a good income and motivational influence of family and PHM. Moreover, women in both urban and rural areas have benefited from the great support provided by family members in childbearing and child care while estate women often receive minimal support.

PHMs perceived no considerable son or daughter preference in their working areas. Unlike their counterparts in other South Asian countries, gender preference doesn't seem to be a decisive factor for families in Sri Lanka (Arnold, 2001). As a result, sex selective abortions may very rare in Sri Lanka, though there are no reliable statistics. Moreover, according to the view of PHMs,

unplanned pregnancies were very rare in both urban and rural areas in Sri Lanka and such unplanned pregnancies were also reported for the third birth. On the other hand, there was a high risk of reporting unplanned pregnancies for the second and the third births in the estate sector.

The study found that women in Sri Lanka have the power, autonomy and easy access to use their desired contraceptive method. Despite that power, estate women mostly depend on Depo-provera throughout their reproductive life span due to the limited access to LRT. Thus, poor socio-economic background and educational achievements, poor support systems and contraceptive access were emphasized in estate sector.

8.10. Summary

This chapter aimed at exploring the role and perceptions of PHMs regarding the women's childbearing behavior based on the urban, rural and estate sectors in Sri Lanka. Quantitative data on PHMs from SLDHS 2016 showed the contribution of PHMs in delivering prenatal and postnatal care considering births between 2011 to 2016 period. Having provided a quantitative base for midwifery care, latter parts intended to delve deep into the midwifery system at hand to discuss information about PHMs perceptions, attitudes, thinking and experiences.

CHAPTER NINE

Summary, Conclusion, Policy Implications and Suggestions for Further Research

9.1. Summary and Conclusion

The objective of this study was to investigating childbearing practices and the role of midwifery care in Sri Lanka. The study mainly utilized micro data from SLDHS 2016 and interview series with PHMs. In order to provide reasonably accurate and reliable estimates on CEB and relevant childbearing practices in Sri Lanka, analyses are presented at national, district, sector and micro levels. Selected characteristics of women were tested using an OLS regression model to investigate the extent to which those characteristics are significant in explaining the CEB of women in Sri Lanka. Accordingly, four models were used to predict CEB, namely, Model A (demographic factor), Model B (cultural factor), Model C (female autonomy related factor) and Model D (contextual factor).

National figures showed that there was a reversal trend of fertility transition after 2000. However, recent data suggested that fertility in Sri Lanka is placed near replacement level of fertility proving that below to above replacement level of fertility is a temporary phenomenon. Suggesting a convergence in fertility across regions, district analysis revealed that the regional variations in fertility have been declining in recent decades. Thus, district fertility levels in Sri Lanka currently remain within a narrow range (TFR 1.8-2.6) compared to previous decades. From 2006 to 2012 an increase of fertility in all districts of Sri Lanka was observed for the first time in the transitional process. Women in Moneragala married much earlier than other women in Sri Lanka, where it is considered as the poorest district. The median age at first marriage, first sexual intercourse and first birth are rising in most districts while evidence of pre-marital sexual relationships was observed from Kandy, Mannar and Mullaitivu. Further, the majority of districts reflected some decrease in the use of traditional contraceptive methods with an increase in modern contraceptive methods. Interestingly, the least developed rural districts in Sri Lanka reported a high prevalence of modern methods compared to more urbanized districts. This finding suggests

that the observed usage patterns of contraceptives in Sri Lanka are still unique and unusual as described by Caldwell et al (1987).

Micro level analysis showed that fertility in Sri Lanka has remained around the replacement level of fertility. Women tend to have slightly smaller number of (2.39) children compared to their ideal figure (2.54). The results of the OLS regression model showed that all the models were significantly associated with explaining variations in CEB while age at first marriage(Model A) was the most significant predictor of CEB. The findings suggest that childbearing practices of women in Sri Lanka are largely determined by demographic, cultural, and female autonomy related factors. Interestingly, cultural factors contribute to the explanation of the variations in CEB rather than female autonomy related factors. It seems possible that this result is due to the constraints of the measurement for female autonomy in the study.

While controlling for birth cohort, age at marriage, religion, level of education were found to have a strong relationship with CEB. From the four successive birth cohorts, oldest women (born in 1967-1969) were most likely to have higher number of children. On the other hand, CEB showed an inverse relationship with age at first marriage. Further, the study also found significant relationships between CEB and religion. Women who belong to religious minorities have significantly higher number of children. In particular, Muslim and Tamil groups were expected to have higher numbers of CEB. With regard to level of education, it shows an inverse relationship with CEB: the higher the level of education, the lower the number of children implying that autonomous women have had less number of children compared to their less educated counterparts.

This study further set out with an aim of assessing the role and perceptions of PHMs regarding the childbearing practices in Sri Lanka. First, PHMs contribution in maternal care was assessed using micro data of SLDHS 2016. About 99 percent of pregnancies were registered by PHMs. Further, both urban and rural women were registered their pregnancy within the first trimester of pregnancy compared to estate women. More than 95 percent of women had received postnatal

care in all three sectors. However, estate women were less aware of the services provided by hospital after delivery and safety procedures in case of emergency than urban and rural women.

Second, the findings of the interview series with PHMs, suggest that PHMs have an essential role to play in Sri Lankan society. In particular, the expanded field services of PHMs are immensely valued in rural and estate sectors where maternal and child health facilities are scarce. Most urban PHMs perceived an increasing trend of fertility. Both rural and estate PHMs perceived that women had a lack of reproductive health knowledge. Though unplanned pregnancies were rare in urban and rural sectors, there was a high risk of reporting unplanned pregnancies for the second and third births in the estate sector. Both urban and rural women had the autonomy and accessibility to use their desired contraceptive method while estate women's use was mostly limited to hormone injection (Depo-provera). Moreover, estate PHMs perceived that women often receive minimal support from family in childbearing and childcaring while both urban and rural PHMs perceived women receiving great support from family.

The current study contribute to the existing body of knowledge in the field, particularly, regarding the women's characteristics associated with sector of residence, the age at first marriage, childbearing preferences, contraceptive behavior, and the association between CEB and women's characteristics, which has not been recently explored. Moreover, the findings of the interview series with PHMs contribute to a developing understanding of the contribution of PHMs in the provision of antenatal care in Sri Lanka.

9.2. Policy Implications

District analysis revealed that fertility levels do not vary much among districts of Sri Lanka recently as compared to previous decades. Colombo and Gampaha often represent low fertility levels, while Kandy and Kegalle districts show relatively high fertility levels recently. As the population growth rate affects sustainable development negatively, Sri Lanka has to cope with high fertility districts while maintaining an optimum population level in low fertility districts. Therefore, proper monitoring and controlling of fertility is significant for Sri Lanka to achieve its

development goals. Effective strategies would be identifying high and low fertility regions, integrating ethnic and religious aspects in policy making, improving infrastructure facilities with easy access to contraceptives and providing special programs to improve inhabitants' reproductive health knowledge.

The findings of the micro level study suggested that policy makers need to pay more attention on demographic factors along with, cultural, female autonomy related and contextual factors in order to proper monitor and control fertility in Sri Lanka. Further, both micro level study and interview series showed that there is a high demand for sterilization among estate women, while the unmet need for sterilization method seems to be high. As a consequence, estate women were much more vulnerable to unplanned pregnancies than the other women in Sri Lanka as they have limited contraceptive resources. Hence, family planning programs should be re-designed giving particular attention to the estate sector. Correspondingly, it is necessary to expand PHMs services in the estate sector providing additional services such as estate-based counselling services and family planning programs. Nevertheless, due to the poor socio-economic conditions, lower educational achievements and poor family support systems observed in estate sector, it is necessary to introduce various strategies to empower the women in the estate sector. Moreover, the lessons learned from midwifery services in Sri Lanka can be used to strengthen and optimize the maternal and child health systems in other South Asian countries in the region.

9.3. Suggestions for Further Research

Although a number of women's characteristics associated with childbearing are statistically tested to predict the relationship between women's characteristics and CEB, the current study was unable to pay sufficient attention to discuss the relationship between women's relative status, women's autonomy and power on childbearing decision making. Hence, further studies with more focus on women's autonomy is required while including the effect of women's employment, wealth, household decision making power and access to mass media etc.

The current study revealed several disadvantageous factors associated with estate women in Sri Lanka including poor socio-economic background, poor academic achievement, lack of sexual health knowledge, limited access to contraceptives and poor support systems. However, districts with more estate population in Sri Lanka might reflect more vulnerable and disadvantaged characteristics. Further work is therefore suggested to explore the impact of disadvantaged contextual factors on childbearing practices among estate women.

Moreover, the regional analysis was presented descriptively as a basic attempt to describe regional variations in fertility in Sri Lanka. However, statistical analysis should be done in due course to establish the reliability and validity of the findings.

References

Abeykoon, A. (2001). Demographic trends among Major Ethnic Group in Sri Lanka. Sri Lanka *Journal of Population.* 21-39.

Abeykoon, A. T. (1987). Ethnic models of fertility behaviour in Sri Lanka. *Asia-Pacific population journal,* 2(4), 29.

Abeykoon, A. T. P. L. (2006). Fertility Transition in Sri Lanka: The determinants and consequences, *a seminar on Fertility Transition in Asia: Opportunities and Challenges, Bangkok.*

Abeysekera, D. (1982). Being realistic about age at marriage and fertility decline in Sri Lanka. *Ceylon Journal of the Social Sciences,* 5, 1-10.

Acharya, A. K. (2010). The influence of female age at marriage on fertility and child loss in India. *Trayectorias,* 12(31), 61-80.

Acharya, D.R., Bell, J.S., Simkhada, P. et al. (2010). Women's autonomy in household decision-making: a demographic study in Nepal. *Reprod Health*, 7(15). https://doi.org/10.1186/1742-4755-7-15

Adhikari, R. (2010). Demographic, socio-economic, and cultural factors affecting fertility differentials in Nepal. *BMC pregnancy and childbirth*. 10. 19. 10.1186/1471-2393-10-19.

Ajzen, I. (1985). From intentions to actions: A theory of planned behavior. In J. Kuhl & J. Beckmann (Eds.), *Action control: From cognition to behavior.* Berlin, Heidelber, New York: Springer-Verlag. 11-39.

Ajzen, I. (1991). The theory of planned behavior. *Organizational behavior and human decision processes*, 50(2), 179-211.

Alam, I., & Cleland, J. (1981). Illustrative analysis: Recent fertility trends in Sri Lanka, International Statistical Institute.

Amuedo-Dorantes, C., & Kimmel J. (2004). USA: Can the Family Earnings Gap be Reduced by Postponing Maternity?'In: Gustafsson, S. & A. Kalwij (eds.) *Education and Postponement of Maternity.*

Anderton, D. L. (1989). Comment on Knodel's Starting, Stopping, and Spacing during the Early Stages of Fertility Transition. *Demography*, 467-470.

Arnold, F. (2001). Son Preference in South Asia, Zeba Ayesha Sathar and James F. Phillips ed., *Fertility transition in South Asia*, Oxford University Press, London, 281-299.

Arnold, F., Choe, M., & Roy, T. (1998). Son Preference, the Family-Building Process and Child Mortality in India. *Population Studies,* 52(3), 301-315. http://www.jstor.org/stable/2584732

Axinn, W. G., & Fricke, T. (1996). Community Context, Women's Natal Kin Ties, and Demand for Children: Macro-Micro Linkages in Social Demography 1. *Rural Sociology,* 61(2), 249-271.

Balasundaram, S. (2009). The Structural Violence of Sterilization: Politics of Sterilization in the Plantation Tamil Communities of Sri Lanka. *Masters of Arts Thesis, Department of Anthropology, College of Arts and Sciences, University of South Carolina*.

Balasuriya, A., Jayawardena, N., Perera, R., & Morgan, A. (2008). Challenges faced by public health midwives in Sri Lanka: *a qualitative research using novel photovoice methodology*.

Beaujouan, E., Berghammer, C. (2019). The Gap Between Lifetime Fertility Intentions and Completed Fertility in Europe and the United States*: A Cohort Approach. Popul Res Policy Rev 38,* 507–535. https://doi.org/10.1007/s11113-019-09516-3

Becker, G. S. (1976). *The Economic Approaches to Human Behavior*, University of Chicago Press, Chicago.

Beneragama, A.P.S. (1991). *Knowledge attitudes and practices of Public Health Midwives in relation to immunization practices that are carried out in Maternal and Child Health Clinics in a defined Health Unit Area*. Thesis for MSc.(Community Medicine), Post Graduate of Medicine (PGIM), University of Colombo.

Blau, P. (1997). On Limitations of Rational Choice Theory for Sociology. *The American Sociologist*, 28(2), 16-21. http://www.jstor.org/stable/27698825

Bogren, M. (2016). Buildning a midwifery profession in South Asia. *University of Gothenburg.* Sahlgrenska Academy. http://hdl.handle.net/2077/40890

Bongaarts, J. (1978). A framework for analyzing the proximate determinants of fertility. *Population and development review*, 105-132.

Bongaarts, J. (2002). *The end of the fertility transition in the developing world.* Paper prepared for the UN Expert Group Meeting on Completing the Fertility Transition. New York.

Bongaarts, J., & Amin, S. (2001). Levels and trends in fertility and mortality in South Asia: A review of recent evidence, Zeba Ayesha Sathar and James F. Phillips ed., *Fertility transition in South Asia, Oxford University Press, London,* 401-422.

Bongaarts, J., & Potter, R.G. (1983). *Fertility, biology and behavior: An analysis of the Proximate Determinants*, New York: Academic Press.

Bongaarts, J., & Watkins, S. C. (1996). Social interactions and contemporary fertility transitions. *Population and development review*, 639-682.

Bumpass, L., & Westoff, C. F. (1969). The prediction of completed fertility. *Demography*, 6(4), 445-454.

Butler M, Fraser DM, Murphy RJL. (2008). What are the essential competencies required of a midwife at the point of registration? *Midwifery, 24, 260–269*.

Caldwell, B. (1996). The family and demographic change in Sri Lanka. *Health transition review: the cultural, social, and behavioural determinants of health, 6 Suppl, 45–60.*

Caldwell, J. C. (1982). *Theory of fertility dicline*. New York: Acadamic press.

Caldwell, J., Gajanayake, I., Caldwell, B., & Caldwell, P. (1989). Is marriage delay a multiple response to pressure for fertility decline? The case of Sri Lanka, *Journal of marriage and the family,* 51, 337-351.

Caldwell, J., Gaminiratne, K. H. W., Caldwell, P., De Silva, S., Caldwell, B., Weeraratne, N., & Silva, P. (1987). The role of traditional fertility regulation in Sri Lanka. *Studies in family planning,* 18(1), 1-21.

Calhoun, L. M., Nanda, P., Speizer, I. S., & Jain, M. (2013). The effect of family sex composition on fertility desires and family planning behaviors in urban Uttar Pradesh, India. *Reproductive Health*, 10 (48). http://doi.org/10.1186/1742-4755-10-48

Casterline, J.B. (2001). *Diffusion processes and fertility transition: Selected perspectives,* National Research Council. Washington, D.C.: National Academy Press. doi:10.17226/10228.

Central Bank of Sri Lanka. (2016), *Sri Lanka socio-economic data*, Vol. XXXIX. Colombo. Central Bank of Sri Lanka.

Chandrasekhar, S. (2010). Factors Affecting age at marriage and age at first birth in India. *J. Quantitative Econ.* 8(2), 81-97.

Chowdhury, A. H. M. Y, Rumana, A. S., Arif, M., and Faisal, A. M. D. (2017). Factors affecting age at first birth: An exploratoty analysis on Bnagladeshi women. *International journal of research studies in medical and health sciences,* 2(7), 31-37.

Cigno, A. (1991). *Economics of the Family*. Oxford: Oxford University Press.

Cigno, A. and Ermisch J. (1989). A Micro –Economic Analysis of the Timing of Births. *European Economic Review, 33 (4), 737-60.*

Coale, A. J., & Trussell, T. J. (1974). Model fertility schedules: variations in the age structure of childbearing in human populations. *Population index, 185-258.*

Coale, A. J., & Trussell, T. J. (1978). Finding the two parameters that specify a model schedule of marital fertility. *Population Index, 203-213.*

Cody, M. L. (1966). A General Theory of Clutch Size. *Society for the Study of Evolution*, 20(2), 174-184. http://doi:10.2307/2406571

Croix, D. D. & Gobbi, P. E. (2016). Population Density, Fertility, and Demographic convergence in Developing Countries, *IRES Discussion Papers, 3,* Université Catholique de Louvain.

Croix, D. D. & Gobbi, P. E. (2017). Population density, fertility, and demographic convergence in developing countries, *Journal of Development Economics,* 127, 13-24.

Curtis, K. M., Mohllajee, A. P., & Peterson, H. B. (2006). Regret following female sterilization at a young age: *a systematic review on. Contraception,* 73(2), 205-210.

D'Almeida, K. (2020). *Women's Health: On Sri Lanka's Tea Estates, Maternal Health Leaves a Lot to Be Desired*. Inter press service, news agency. http://www.ipsnews.net/2014/09/on-sri-lankas-tea-estates-maternal-health-leaves-a-lot-to-be-desired/

Dangalle, N. (1982). Demographic Transition in Sri Lanka. *Sri Lanka Journal of Social Sciences,* 5(2), 1-29.

Daniel, S. (2016). *Why Sri Lanka beats India in maternal mortality ratios*. Al Jazeera, 14.

Davis, K., & Judith B. (1956). *Social Structure and fertility: an analytic framework. Economic Development and Cultural Change* (Chicago, Illinois), 4(3), 221-235.

DeJonckheere, M., & Vaughn, L.M. (2019). Semi structured interviewing in primary care research: a balance of relationship and rigour. *Family Medicine and Community Health.* 7(2), 1-8. https://fmch.bmj.com/content/7/2/e000057

Department of Census and Statistics (DCS) [Sri Lanka]. (2002). *Sri Lanka Demographic & Health Survey 2000*, Colombo, DCS.

Department of Census and Statistics (DCS) [Sri Lanka]. (2009). *Sri Lanka Demographic & Health Survey 2006-07*, Colombo, DCS.

Department of Census and Statistics (DCS)]Sri Lanka] (2015). *Census of Population and Housing - 2012.* Colombo, .DCS

Department of Census and Statistics (DCS) [Sri Lanka]. (2017). *Sri Lanka Demographic & Health Survey 2016.* Colombo, DCS.

Department of Census and Statistics and CICRED (1974). *The population of Sri Lanka*, Colombo. DCS.

De Silva, W. I. (1991). Consistency between reproductive preferences and behavior: the Sri Lankan experience. *Studies in Family Planning,* 22(3), 188-197.

De Silva, W. I. (1994). Ahead of target: achievement of replacement level fertility in Sri Lanka before the year 2000, *Asia-Pacific Population Journal,* 9(4), 3.

De Silva, W. I.. (2000). Correlates of marital postponement in Sri Lanka. *Journal of family welfare,* 46(2), 42-50.

De Silva, W.I., Perera, N.B. & Anuranga, K.C. (2010). Below to above Replacement: Increased Fertility and its Determinants in Sri Lanka, *Asia-Pacific Population Journal.* 25(2): 27-52.

Dissanayake, D. M. S. S. L. (1995). The influence of education on the fertility transition in Sri Lanka, *Doctoral dissertation.*

Dissanayake, L. (1996). Relative Impact of Starting, Spacing and Stopping Fertility Behaviour in Sri Lanka. *The Journal of Family Welfare*, 42(3), 1-7.

Dommaraju, P. (2008). Marriage age and fertility dynamics. *DHS Working Papers, 52*, Calverton, MD: Macro International.

Durkheim, E. (2014). *The division of labor in society*. Simon and Schuster.

Dyson, T., (2001). Birth Rate Trends in India, Sri Lanka, Bangladesh and Pakistan: A Long Comparative View", Zeba Ayesha Sathar and James F. Phillips ed., *Fertility transition in South Asia*, Oxford University Press, London, .51-77.

Dyson, T., & Moore, M. (1983). On Kinship Structure, Female Autonomy, and Demographic Behavior in India. *Population and Development Review,* 9(1), 35-60. doi:10.2307/1972894

Easterlin, A. R. (1978). The economics and sociology of fertility a synthesis In Historical studies . Princeton : Princeton University press.

Edmeades, J., Pande, R., Macquarrie, K., Falles, T., & Malhotra, A. (2012). Two sons and a daughter: Sex composition and women's reproductive behavior in Madhya Pradesh, India. *Journal of Biosocial Science,* 44, 749-764.

Entwisle, B., Casterline, J. B., & Sayed, H. A. (1989). Villages as contexts for contraceptive behavior in rural Egypt. *American Sociological Review*, 1019-1034.

Fernando, D. F. (1976). Fertility trends in Sri Lanka and future prospects. *Journal of biosocial science,* 8(1), 35-43.

Fernando, D.F.S. (1972). Recent fertility decline in Ceylon, *Population Studies.* 26.

Fernando,T.E.I. (1997). *Study on the outcome of a distance education programme on knowledge, attitudes and performances of public health midwives in post partum care of the mother and in care of the newborn*. Thesis for MD (Community Medicine), Post Graduate of Medicine (PGIM), University of Colombo.

FHB. (2010), *Annual report on family health Sri Lanka* (2010). Family Health Bureau. Ministry of Health. Colombo. Sri Lanka.

Fort, M., Schneeweis, N. E., & Winter-Ebmer, R. (2011). *More schooling, more children: Compulsory schooling reforms and fertility in Europe*.

Fox, N. (2009). *Using interviews in a research project*. The NIHR RDS for the East Midlands/Yorkshire & the Humber.

Freedman, R., A. I. Hermalin, and M. C. Chang. (1975). Do statements about desired family size predict fertility? The case of Taiwan 1967- 70. *Demography* 12, 3: 407-416.

Gabrysch, S., McMahon, S., Siling, K. et al. (2016). *Autonomy dimensions and care seeking for delivery in Zambia; the prevailing importance of cluster-level measurement*. Sci Rep 6, 22578 https://doi.org/10.1038/srep22578

Gajanayake, I., (1984). Recent regional fertility patterns in Sri Lanka, *Sri Lanka Journal of Social Science*, 7(1). 23-39.

Ghimire D. J. (2017). Social context of first birth timing in a rapidly changing rural setting. *Social science research*, 61, 314–329. https://doi.org/10.1016/j.ssresearch.2016.07.001

Guilmoto, C. Z., & Rajan, S. I. (2013). Fertility at the district level in India: Lessons from the 2011 census, *Economic and Political weekly*, 59-70.

Gunetilleke, N., Kuruppu, S., and Goonasekera, s. (2008). The Estate Workers' Dilemma: Tensions and Changes in the Tea and Rubber Plantations in Sri Lanka, Study Series, 4. Centre for Poverty Analysis (CEPA): Colombo.

Gustafsson, S., & Wetzels, C. (2000). Optimal age at maternity in Germany, Great-Britain, the Netherlands and Sweden.' In: Meulders, D. (ed.) *Gender and the Labor Market. Econometric Evidence on Obstacles in Achieving Gender Equality*. Applied Econometric Association Conference Series, London: Mac Millan.

Gustafsson, S. S. (2001). Optimal Age at Motherhood: Theoretical and Empirical Considerations on Postponement of Maternity in Europe. *Journal of Population Economics, 14, 225-247.*

Halldorsdottir, S., & Karlsdottir, S. I. (2011). The primacy of the good midwife in midwifery services: an evolving theory of professionalism in midwifery. *Scandinavian journal of caring sciences,* 25(4), 806-817.

Haloi, A. (2014). Fertility differentials by incidence of marriage and their reproductive wastage in a Muslim population from rural North-East India. *Human Biology Review,* 3(1), 1-14.

Hardy, E., Bahamondes, L., Osis, M. J., Costa, R. G., & Faúndes, A. (1996). Risk factors for tubal sterilization regret, detectable before surgery. *Contraception,* 54(3), 159-162.

Heaton, T. B., Jacobson, C. K., & Holland, K. (1999). Persistence and change in decisions to remain childless. *Journal of Marriage and the Family,* 531-539.

Henry, L. (1977). *Theoretical basis of measures of natural fertility*. In Mathematical Demography . 373-382. Springer, Berlin, Heidelberg. https://doi.org/10.1007/978-3-642-81046-6_41

Henshaw, S. K., & Singh, S. (1986). Sterilization regret among US couples. *Family Planning Perspectives,* 18(5), 238-240.

Hermalin, A. I., R. Freedman, T. H. Sun and M. C. Chang. (1979). Do intentions predict fertility? The experience in Taiwan 1967-74. *Studies in Family Planning,* 10(3), 75-95.

Hettiarachchi, J., & Gunawardena, N. (2012), Factors related to choice of modern vs traditional contraceptives among women in rural Sri Lanka, *Sri Lanka Journal of Obstetrics and Gynaecology.* 33(1).

Hirschman, C. (1994). Why fertility changes. *Annual review of sociology*, 203-233.

Huijgen, C. M. J. (2010). *Family formation and marriage patterns: a comparison between Sri Lanka and Europe*, Master's thesis.

Human Development Report. (2019). New York: *United Nations Development Programme. 300–303.* ISBN 978-92-1-126439-5.

Humanity house. (2017). Disasters & Conflicts: Sri Lanka. Civil war, 1983-2009 https://humanityhouse.org/en/rampen-conflicten-sri-lanka-burgeroorlog-1983-2009/

Ida, L.A & Albert, A. (2015). The Statistical Distribution and Determinants of Mother's Age at First Birth. *American Journal of Theoretical and Applied Statistics,* 4(2), 41-52. http://www.sciencepublishinggroup.com/j/ajtas

Ikamari, L. D. (2005). The effect of education on the timing of marriage in Kenya. *Demographic Research,* 12, 1-28.

Islam, M., Rob, U., & Chakroborty, N. (2003). Regional variations in fertility in Bangladesh, *Genus*, 59(3/4), 103-145. http://www.jstor.org/stable/29788777.

Jayatilleke, A.C. et al. (2015). Training Sri Lankan public health midwives on intimate partner violence: *a pre- and post-intervention study. BMC Public Health. 15(1)*. https://bmcpublichealth.biomedcentral.com/articles/10.118 6/s12889-015-1674-9

Jayawardane, C. H. S., & Selvaratnam, S. (1967). *Fertility levels & trends in Ceylon*. Paper presented to the IUSSP conference, Sydney.

Jejeebhoy, S. J. (1995). *Women's education, autonomy, and reproductive behaviour: Experience from developing countries*. OUP Catalogue.

Kabir, A., Ali, R., Islam, M. S., Kawsar, L. A., & Islam, M. A., (2009). A comparison of regional variations of fertility in Bangladesh, *International quarterly of community health education,* 29(3), 275-291.

Kantner, A & He Shi-Jen., (2001). Levels and trends in fertility and mortality in South Asia: A review of recent evidenc, Zeba Ayesha Sathar and James F. Phillips ed., *Fertility transition in South Asia,* Oxford University Press, London, 23-50.

Kato, H. (2018). The Analysis on Disparities of Fertility Rate of Japanese Municipalities, *Public Policy Review,* 14(1), 1-24.

Kato, H., & De Silva, P. N. K. (n.d.) Survey on Access to Health Service in Rural Area in Sri Lanka. http://library.jsce.or.jp/jsce/open/00039/200911_no40/pdf/16.pdf.

Kawabe, H. (1979). On the regional differences of fertility in Japan, Jinko Mondai Kenkyu. *Journal of Population Problems,* (150), 1-14.

Kim, J. (2016). *Female education and its impact on fertility*. IZA World of Labor.

Kirk, D. (1969). Natality in the developing countries: recent trends and prospects. *Fertility and family planning: a world view,* 75-98.

Knodel , J. (1987). Starting, Stopping, and Spacing During the Early Stages of Fertility Transition: The Eperience of German Village Populations in the 18th and 19th Centur. *Demography* 24(2), 143-162.

Langford, C.M., (2001). Fertility decline in Sri Lanka: Could fertility now be at about replacement level, Zeba Ayesha Sathar and James F. Phillips ed., *Fertility transition in South Asia,* Oxford University Press, 121-134.

Leridon, H. (1977). Human fertility: the basic components (Translated by Helzner, J.F) Chicago, University of Chicago Press.

Lesthaeghe, R., Kaufmann, G. and Meekers, D. (1989). The Nuptiality regimes in sub- Saharan Africa. In Reproduction and Social Organisation in Sub-Saharan Africa. Ron Lesthaeghe, ed. Berkeley: University Of California Press.

Lesthaeghe, R., & Van de Kaa, D. J. (1986). Two demographic transitions. Population: Growth and decline, 1, 9-24.

Levin, J., & Milgrom, P. (2004). *Introduction to choice theory*. http://web.stanford.edu/~ jdlevin/Econ, 20202.

Levine, R (2007). Saving Mothers' Lives in Sri Lanka. *Center for Global Development*. http://www.cgdev.org/page/case-6-saving-mothers-lives-sri-lanka

Liefbroer, A. C. (2009). Changes in family size intentions across young adulthood: A life-course perspective. *European Journal of Population,* 25(4), 363-386.

Liyanage, I. K. (2013). *Education system of Sri Lanka: strengths and weaknesses*. Institute of Developing Economies, Japan External Trade Organization, 116-140.

Lundgren I, Dahlberg K. (2002) Midwives' experience of the encounter with women and their pain during childbirth. Midwifery, 18, 155-64.

Lutz, W., & Qiang, R. (2002). Determinants of human population growth, *Philosophical Transactions of the Royal Society of London Series B: Biological Sciences,* 357(1425), 1197-1210.

Lutz, W., Testa, M. & Penn, D. (2006), Population Density Key Factor in Declining Human Fertility, *Population and Environment*. 28. 69-81. 10.1007/s11111-007-0037-6.

Malalgoda, K. (1976). Buddhism in Sinhalese Society, 1750–1900: A Study of Religious Revival and Change. Berkeley and Los Angeles: University of California Press.

Marcil-Gratton, N. (1988). Sterilization regret among women in metropolitan Montreal. *Family planning perspectives,* 20(5), 222-227.

Marphatia, A. A., Saville, N. M., Amable, G. S., Manandhar, D. S., Cortina-Borja, M., Wells, J. C., & Reid, A. M. (2019). Substantial education delays women's age at marriage and first pregnancy in lowland Nepal. *Frontiers in Public Health,* 7, 396.

McNicoll, G. (1980). Institutional determinants of fertility change. *Population and development review,* 441-462.

Menike, H.R.A., (2014). The Impact of Demographic Transition on the Economic Growth and Development in Sri Lanka from 1963 to 2007, *Indian Journal of Research in Management, Business and Social Sciences (IJRMBSS).*

Midwives' Voices, Midwives' Realities Report. (2016). http://apps.who.int/iris/bitstream/10665/250376/1/9789241510547-eng.pdf?ua=1

Miller, W. B. (1994). Childbearing motivations, desires, and intentions: A theoretical framework. Genetic, Social, and General Psychology Monographs, 120 (2), 223–258.

Mills, M., Rindfuss, R. R., McDonald, P., & Te Velde, E. (2011). Why do people postpone renthood? Reasons and social policy incentives. Human reproduction update, 17(6), 848-860.

Ministry of Health and Women's Affairs. (1992), Sri Lanka Country Report, Fourth Asian and Pacific Population Conference, 19-27 August 1992, Bali, Indonesia. Colombo: Population Division.

Moldrich, D. (1989). Bitter Berry Bondage: The Nineteenth Century Coffee Workers of Sri Lanka. Kandy: Co-ordinating Secretariat for Plantation Areas.

Montgomery, K. (n.d.). The Demographic Transition. https://pages.uwc.edu/keith.montgomery/Demotrans/demtran.htm

Morgan, S. P., & Rackin, H. (2010). The Correspondence between Fertility Intentions and Behavior in the United States. *Population and development review,* 36(1), 91–118. https://doi.org/10.1111/j.1728-4457.2010.00319.x

Mugarura A., Kaberuka W & Atuhaire, R. (2016). Factors determining the age at first birth in Uganda. *Scientific Research Vol.1 (5),* 61-66, http://www.journaliss ues.org/ISR/

Nahallage, C. & Huffman, M & Kuruppu, N. (2009). Administrative province and district map of Sri Lanka (Produced by Dr. Janet Nackoney). Diurnal Primates in Sri Lanka and People's Perception of Them. Primate Conservation.

Na'im, A. A. A., (2015). Islamic family law, https://scholarblogs.emory.edu/islamic-family-law/home/research/legal-profiles/sri-lanka-democratic-socialist-republic-of/.

Nigatu, D., Gebremariam, A., Abera, M., Setegn, T., & Deribe, K. (2014). Factors associated with women's autonomy regarding maternal and child health care utilization in Bale Zone: a community based cross-sectional study. *BMC women's health,* 14(1), 79.

Notestein, F. W. (1945). *Population-The long view*, T. Schultz (ed.), Food for the World. 36-57, The University of Chicago Press.

Nove, A., Moyo, N. T., Bokosi, M., & Garg, S. (2018). The Midwifery Services Framework: the process of implementation. Midwifery, 58, 96-101.

Okun, B. S. (1995). Distinguishing Stopping Behavior from Spacing Behavior with Indirect Methods, Historical Methods: *A Journal of Quantitative and Interdisciplinary History,* 28:2, 85-96, doi: 10.1080/01615440.1995.9956357

Osamor, P. E., & Grady, C. (2016). Women's autonomy in health care decision-making in developing countries: a synthesis of the literature. *International journal of women's health,* 8, 191.

Palipane,W.M. (1997). Study on knowledge and attitudes of Public Health midwives on selected mosquito borne diseases in the Anuradhapura District. *Thesis for MSc.(Community Medicine). Post Graduate of Medicine (PGIM), University of Colombo.*

Peebles, P. (2001). *The Plantation Tamils of Ceylon*. London: Leicester University Press.

Perera, E. L. S. J. (2017). Fertility transition in Sri Lanka: is it a temporary phenomenon?. *Journal of biosocial science,* 49(S1). S116-S130.

Philipov, D. (2011). Theories on fertility intentions: A demographer's perspective. *Vienna Yearbook of Population Research* 9: 37-45. doi:10.1553/populationyearbook2011s37.

Population Reference Bureau. (n.d.) Glossary of Demographic Terms.http://www.prb.org/Publications/Lesson-Plans/Glossary.aspx.

Population Reference Bureau. (2007). 2007 world population data sheet. Washington, DC: PRB.

Rabbi, A. M. F., and Kabir, M. H. M. I. (2013). Factors Influencing Age at First Birth of Bangladeshi Women- *A Multivariate Approach. American J. Public Health Res.*1 (7): 191-195.

Retherford, R.D., and Rele, J.R. (1989). A decomposition of recent fertility changes in South Asia, *Population and Development Review,* 15 (4), 739-747.

Rindfuss, R.R, A. Parnell and C. Hirschman (1983), The timing of entry into motherhood in Asia: a comparative perspective, *Population Studies,* 37, 253-272.

Rodgers, G. B. (1976). Fertility and desired fertility: Longitudinal evidence from Thailand. *Population Studies* 30(3), 511-526.

Rogers, J. D. (1994). Post-Orientalism and the interpretation of premodern and modern political identities: The case of Sri Lanka. *The Journal of Asian Studies,* 10-23.

Ronsmans, C. Graham, W.J. and the Lancet Maternal Survival Series steering group (2006). Maternal mortality: who, when, where, and why, Maternal Survival Series, 368: 1189-1200.

Sacco, D., & Osipowicz, K. (2012). Life history theory and social psychology. Frontiers in evolutionary neuroscience, 4, 13.

Sarkar, N. K. (1957). The demography of Ceylon. Printed at the Ceylon Government Press.

Sarker, P. (2010). Determinants of age at first birth in Bangladesh. J. Modern Math. and Stat. 4(1): . 1-6.

Sathar, Z.A & Phillips, J.F. (2001). Introduction, Zeba Ayesha Sathar and James F. Phillips ed., Fertility transition in South Asia, Oxford University Press, London, 1-20.

Schoen, R., Astone, N. M., Kim, Y. J., Nathanson, C. A., & Fields, J. M. (1999). Do fertility intentions affect fertility behavior? *Journal of Marriage and the Family,* 790-799.

Siddhisena, K.A.P. (2000). Determinants and implications of fertility trends in Sri Lanka: retrospectus and prospectus *Sri Lanka Journal of Population Studies,* 3, 35-58.

Silva, A.P.D. (2011). The contribution of Public Health Midwives to better health in rural communities in Sri Lanka. WHO: Global Health Workforce Alliance. https://www.who.int/workforcealliance/forum/2011/hrhawards cs28/en/

Singh, A., Ogollah, R., Ram, F., & Pallikadavath, S. (2012). Sterilization regret among married women in India: implications for the Indian national family planning program. *International perspectives on sexual and reproductive health,* 187-195.

Siriwardhana, D. D., Pathmeswaran, A., & Wickremasinghe, A. R. (2019). Socioeconomic inequality and determinants of postnatal home visits made by public health midwives*: An analysis of the Sri Lanka Demographic and Health Survey. PloS one,* 14(4), e0215816.

Solanke, B. L. (2015). Marriage age, fertility behavior, and women's empowerment in Nigeria. Sage Open, 5(4), 2158244015617989.

Som, K.S., & Mishra R.P. (2017). Education, Religion, Development and Regional Patterns of Fertility in West Bengal, *Indian Journal of Spatial Science.*

Sougou, N. M., Bassoum, O., Faye, A., & Leye, M. M. M. (2020). Women's autonomy in health decision-making and its effect on access to family planning services in Senegal in 2017: *a propensity score analysis. BMC Public Health,* 20, 1-9.

Spoorenberg, T., & Dommaraju, P. (2012). Regional fertility transition in India: An analysis using synthetic parity progression ratios, *International Journal of Population Research,* 2012.

Sri Lanka. FHB and Ministry of Health. (2011). Maternal care package *A guide to field healthcare workers.* Colombo: Ministry of Health.Sri Lanka.

Sri Lanka. Ministry of Health and indigenous medical services. (2020). Annual Health Statistics.

Sri Lanka in South Asia map: https://sites.google.com/a/mkis.edu.my/country-portfolios-ib-eco-16/1-development/sri-lanka

Testa, M. R. (2014). On the positive correlation between education and fertility intentions in Europe: Individual-and country-level evidence. *Advances in life course research,* 21, 28-42.

Tilakaratna, G.M. (2006). Educational opportunities for the poor Sri Lanka; *Inter-Regional Inequality Facility Policy Brief 11,* Overseas Development Institute, UK, 4.

Tolnay, S.E., Guest, A.M. (1984). American Family Building Strategies in 1900: Stopping or Spacing. *Demography,* 21, 9-18 https://doi.org/10.2307/2061023

UNDP. (2019). Human Development Report 2019. Inequalities in Human Development in the 21st Century*,* United Nations Development Program.

United Nations Population Division (2019). World Population Prospects: 2019 Revision. https://www.indexmundi.com/facts/sri-lanka/indicator/SP.POP.BRTH.MF

Van de Kaa, D. (1996). Anchored Narratives: The Story and Findings of Half a Century of Research into the *Determinants of Fertility. Population Studies,* 50(3), 389-432. http://www.jstor.org/stable/2174640.

Van den Broeck, G., & Maertens, M. (2014). *Does female employment reduce fertility rates? Evidence from the Senegalese horticultural export sector* (No. 727-2016-50359).

Verbeek, M. (2017). Using linear regression to establish empirical relationships. IZA World of Labor.

Wang, D. & Chi, G. (2017). Different Places, Different Stories: A Study of Spatial Heterogeneity of County-Level Fertility in China, *Demographic research,* 37, 493.

Westoff, C. F., Mishler, E. G., & Kelly, E. L. (1957). Preferences in size of family and eventual fertility twenty years after. *American Journal of Sociology,* 62(5), 491-497.

WHO. (2018). *World Health Rankings.* https://www.worldlifeexpectancy.com/sri-lanka-life-expectancy

Wijesekere, G and Arunachalam, D. (2015) Explaining the fertility puzzle in Sri Lanka. *Journal of Biosocial Science,* CJO. doi:10.1017/S0021932015000012

Wijesinghe, M. D. J. W., and Siddhisena, K. A. P. (2017) *Economic and social determinants of starting and stopping behaviour of fertility in Sri Lanka.* ICORE. Malaysia.

World Health Organization. (2004). M*aking pregnancy safer: the critical role of the skilled attendant: a joint statement by WHO*, ICM and FIGO.

Wright, N. H. Recent. (1968). Recent fertility change in Ceylon & prospects for National Family Planning Programme. *Demography*, 5(2), 745-746.

Wrigley, E. A. (1966). Family limitation in pre-industrial England. *The Economic History Review, 19(1), 82-109.*

Xenos, P., & Gultiano, S. A. (1992). *Trends in female and male age at marriage and celibacy in Asia*. East-West Center; Honolulu.

Yapa, L. & Siddhisena, P. (1998). Locational specificities of fertility transition in Sri Lanka, *Geo Journal,* 45(3), 177-188.