

**Factors underlying fertility transition in
Zimbabwe: An examination of proximate
determinants using data from Demographic
and Health Surveys.**

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ABSTRACT

Zimbabwe is amongst the few countries in Africa with a low fertility rate. The fertility transition began in the 1980s and has continued in recent years. The total fertility rate (TFR) declined from 5.5 births in 1988 to 4.3 births in 1994 and further declined in 1999 and 2005 to 4.0 births and 3.8 births respectively. Fertility declined by 1.7 births from 1988 to 2005. This study examines and evaluates the proximate determinants responsible for fertility decline in Zimbabwe from 1988 to 2005. The study attempts to address two questions: What are the principal proximate determinants responsible for fertility reduction in Zimbabwe? What is the contribution of each of the proximate determinants to fertility decline at different periods of time in Zimbabwe?

This study utilizes data from the Zimbabwe Demographic and Health Surveys (ZDHS) conducted in Zimbabwe from 1988 to 2005. The model introduced by Bongaarts (1978, 1982) and later modified by Jolly and Gribble (1993) will be utilized in this study to evaluate the impact of these proximate determinants on fertility. The results from the study confirm that fertility has declined in Zimbabwe from 1988 to 2005. The decline in fertility was influenced by proportion of women married, contraceptive use and postpartum infecundability. Since abortion is illegal in Zimbabwe, there is no reliable data available to examine its impact on fertility. As a result this determinant was not examined in this study. The results show that contraceptive use is the leading inhibitive factor of fertility from 1988 to 2005 in Zimbabwe. The findings also confirm that postpartum infecundability followed by marriage patterns is also responsible for fertility reduction during the same period. The results also showed that there are no variations in proximate determinants of fertility from 1988 to 2005.

A review of the literature suggests that Zimbabwe is amongst the few countries in the sub-Saharan Africa with a high contraceptive rate. The family planning programmes introduced by the government before and after independence which were well organized and administered influenced fertility levels observed in Zimbabwe. It is hoped that this study will assist policy makers in developing countries especially Africa to reduce fertility rates.

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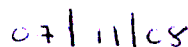
DECLARATION

Submitted in partial fulfilment of the requirements for the degree of Population Studies, in the Graduate Programme in Development Studies, University of KwaZulu-Natal, Durban, South Africa.

I declare that this dissertation is my own unaided work. All citations, references and borrowed ideas have been duly acknowledged. It is being submitted for the degree of Population Studies in the Faculty of Humanities, Development and Social Science, University of KwaZulu-Natal, Durban, South Africa. None of the present work has been submitted previously for any degree or examination in any other University.



Student name



Date

List of Acronyms

ASUFR	Age Specific Union Fertility Rate
C_a	Induced Abortion
C_c	Contraception
C_i	Postpartum Infecundability
C_m	Proportion of Women Married
C_p	Primary Sterility
I_p	Pathological Sterility
DHS	Demographic and Health Surveys
EA	Enumeration Areas
GDP	Gross Domestic Product
IRD	Institute for Resource Development
PPI	Postpartum Infecundability
STIs	Sexual Transmitted Infections
TF	Total Fecundity
TFR	Total Fertility Rate
TNMFR	Total Natural Marital Fertility Rate
TMFR	Total Marital Fertility Rate
TUFR	Total Union Fertility Rates
ZWD	Zimbabwean Dollar
ZDHS	Zimbabwe Demographic and Health Surveys
ZNHSCP	Zimbabwe National Household Survey Capability Programme
ZNFPC	Zimbabwe National Family Planning Council

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CHAPTER ONE

INTRODUCTION

1.1. Background of the Study

The total population of Africa was 100 million in 1900 and increased to 770 million in 2005. The United Nations (2001) suggests that by the year 2050 the population will increase by 1.5 to 2 billion (United Nations 2001). The population of Africa is increasing rapidly compared to other regions of the world (Jolly and Gribble 1993). Guengant (2002) noted that between 1995 and 2000 out of the five regions in Africa three of them still have total fertility rates (TFR) of 6.0 births per women. Rutenberg and Diamond (1993) supports this position, noting that the TFR in some countries in sub-Saharan Africa is 6.5 births per woman. For example studies have shown that countries such as Mozambique, Burundi and Nigeria still experience high fertility levels of 6.3 births, 6.3 births and 6.0 births per woman respectively (United Nations 2000; World Bank 2000).

Some studies also show that fertility has declined faster in Southern African countries such as Botswana, South Africa and Zimbabwe (Potts and Marks 2001; Rutenberg and Diamond 1993; Cohen 1993). In the case of South Africa the fertility transition began in the 1960s and in Botswana the late 1970s (Gaisie 1995; Central Statistical Office–Botswana 2004). In Zimbabwe, the fertility transition began in the mid-1980s and it has continued to decline consistently (CSO 2007). The Zimbabwe Demographic and Health Survey showed that the fertility decline started in the mid-1980s (CSO 1989). The TFR declined from 6.5 in 1984 to 5.5 births per woman in 1988 (Thomas and Muvandi 1994; CSO 2007). In 1994, the TFR was 4.3 and declined further between 1999 and 2005 from 4.0 to 3.8 births per woman (CSO 2007). Thomas and Muvandi (1994) noted that the fertility levels from 1984 to 1994 are lower by African standards but still high by international standards. A number of explanations have been documented for the decline in fertility in the country. Some of the factors include higher levels of education,

improvement in infant and child mortality and lactational infecundability (Guilkey and Jayne 1997), HIV/AIDS (Gregson et al. 1997), marriage and contraceptive use (Mhloyi 1992; Guilkey and Jayne 1997). Some of the factors however, have a direct while others an indirect effect on fertility.

1.2. Features of the Country

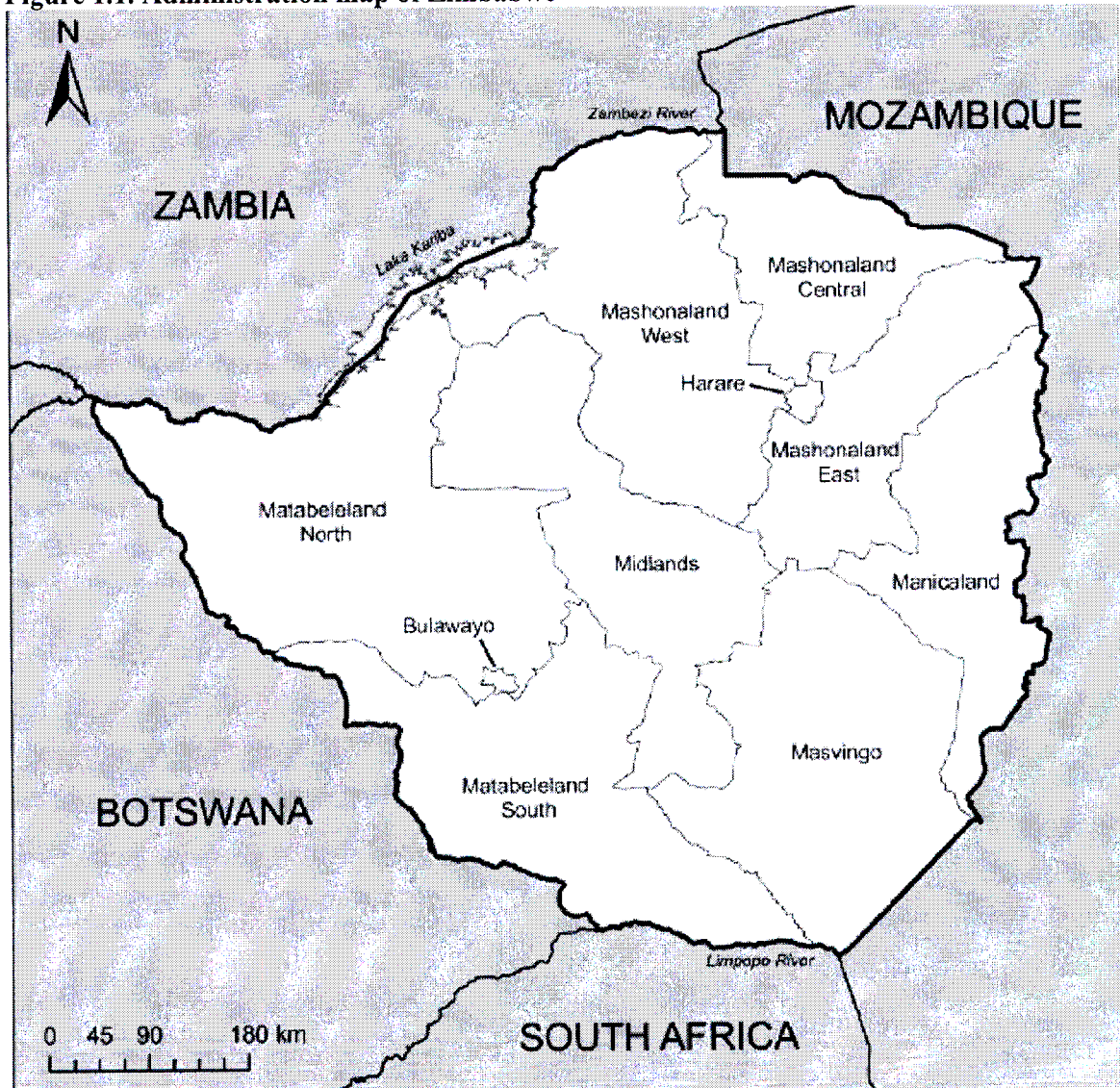
1.2.1 Geography

Zimbabwe is a landlocked country surrounded by Mozambique on the east, South Africa on the south, Botswana on the west and Zambia on the north and northwest (see Figure 1.1; CSO 2007:1). The country is situated north of the Tropic of Capricorn between Limpopo and Zambezi River. Some parts of the country have a great plateau, which comprises the main features of the geology of Southern Africa (CSO 2007). It has been observed that 80 percent of the land is more than 900 meters above the sea level (CSO 2007).

Zimbabwe is made up of ten provinces namely Manicaland, Mashonaland Central, Mashonaland East, Mashonaland West, Matabeleland North, Matabeleland South, Midlands, Masvingo, Harare, and Bulawayo. The country has abundant natural possessions: approximately 8.6 million hectares of arable land, 5 million hectares is occupied by national parks, forests and wildlife estates. There is sufficient supply of ground and surface water which is used for electricity generation, irrigation of crops and domestic and industrial use (CSO 2007:1).

Figure 1.1 presents the administrative map of Zimbabwe.

Figure 1.1. Administration map of Zimbabwe



SOURCE: CSO (2007)

1.2.2. Economy

The country earns its foreign currency from agriculture and mining. The country mainly exports agriculture products which include tobacco, cotton, maize, sugar and groundnuts

(CSO 2007:1). In addition the country also has major industries which include food processing, construction, chemicals, textiles, wood and furniture, and production transport equipment (CSO 2007:1). The economy of Zimbabwe has changed over the years since the country attained its independence in 1980.

Table 1.1 presents the economic indicators of Zimbabwe from 2002 to 2007.

Table 1.1. Recent economic indicator	2002	2003	2004	2005	2006	2007
GDP (US\$bn)	30.9	10.5	4.7	4.6	5.5	16.2
GDP PPP (US\$bn)	33.6	30.7	30.4	29.7	29.2	28.1
GDP per capita (US\$)	2,652	894	401	388	472	1,378
GDP per capita PPP (US\$)	2,884	2,612	2,591	2,534	2,488	2,395
Real GDP growth (% change YOY)	-4.4	-10.4	-3.8	-5.3	-4.8	-6.2
Current account balance (US\$m)	175	-308	-392	-511	-219	-139
Current account balance (% GDP)	-0.6	-2.9	-8.3	-11.2	-4.0	-0.9
Goods exports (% GDP)	5.8	15.9	35.7	36.0	29.8	10.9
Inflation (% change YOY)	133.2	365.0	350.0	237.8	1,016.7	16,170.2

Source: Government of Zimbabwe (2007)

Bijlmakers et al. (1998) noted that after independence the Gross Domestic Product (GDP) per capita which measures the real income reached a peak of 484 Zimbabwean Dollar (ZWD) in 1981 which further declined to ZWD 477 and 453 in 1982 and 1990 respectively. The economy of Zimbabwe has not been performing as expected since 1998. The GDP declined by approximately 40 percent between the period 1998 to 2004 (FAO 2004). Table 1.1 shows that the GDP in US\$bn has been declining over the years. In 2003 the GDP was US\$bn 30.9 and declined to US\$bn 5.5 in 2006, however the figure increased in 2007 to US\$bn 16.2. Table 1.1 shows that the inflation of Zimbabwe has been increasing over the years. Inflation, which has been peaking at 620 percent on an annual basis since November 2000, has seriously affected economic activity and people's welfare in Zimbabwe (FAO 2004). In 2002 the inflation rate was 133.2 percent and reached a peak of 16,170.2 percent in 2007. According to FAO (2008) the inflation of Zimbabwe is 355 000 percent. This percentage is extremely high by international standards.

A study conducted in Zimbabwe observed that poverty was greater in the rural areas (72 percent) than in the urban areas (46 percent) (Government of Zimbabwe 1996). Zimbabwe is predominantly rural, about 70 percent of its population resides in the rural areas where the main source of income is from subsistence farming (CSO 1989). This shows that the majority of Zimbabweans are living below the poverty line. The country has experienced approximately six major famines in the 20th century (The National Economic Commission 1993 cited in Muntro 2002).

1.2.3. Population

Table 1.2 shows that the population of Zimbabwe has increased rapidly from 1982 to 1992 and increased more slowly from 1997 to 2002. The country experienced a high population growth rate of 3.0 percent and 3.1 percent in 1982 and 1992 respectively. This high growth rate is responsible for the rapid increase in population during this period. It can be noted that the growth rate declined rapidly from 3.3 percent in 1982 to 1.1 percent in 2002 respectively. The low growth rate could be due to declining fertility levels in the country (CSO 1995). Fertility has been declining in Zimbabwe over the years. Table 1.3 shows that the estimated crude birth rate decreased from 39.5 births in 1982 to 30.3 births per 1000 population in 2002.

Table 1.2. Summary of demographic indicators in Zimbabwe from 1982 to 2002

Year	1982	1992	1997	2002
Sex ratio	96	95	92	94
Crude birth rate (per 1000)	39.5	34.5	34.7	30.3
Life expectancy at birth	57.4	61.0	57.0	45.0
Population (Millions)	7.608	10,412	11,789	11,632
Growth Rate (%)	3,0	3.1	2.5	1.1

Sources: CSO (1989; 1995; 1999; 2007)

Table 1.2 shows that in Zimbabwe there are more females than males. The low sex ratio can be attributed to the high mortality rates of males compared to females. The life expectancy in the country has been declining rapidly from 57 years in 1997 to 45 years in

2002. In 2005, a large percent of the population (41 percent) in Zimbabwe were below the age of 15 (CSO 2007). In addition a small percentage of the people were above the age of 65. Zimbabwe has a relatively youthful population. This also suggests a high dependency ratio in Zimbabwe.

A study conducted by the United Nations (2004) estimated that every week about 3 000 people are dying from diseases associated with AIDS. Table 1.3 below shows that in 1986 the prevalence rate was 3.2 percent. The rate reached a peak of 25.8 percent in 1997 and declined to 24.6 percent in 2003. In most countries in Africa (including Zimbabwe) the epidemic has been observed to be high amongst young women and children. UNAIDS (2005) observed that in 2001 and 2002 the epidemic was 17 percent amongst women aged 15-24 years while only 5 percent of men of the same age group were infected with the disease.

Table 1.3. Estimated HIV prevalence in adult population (%) from 1986 to 2003						
Year	1986	1995	1997	1999	2001	2003
Prevalence	3.2	17.1	25.8	25.1	24.9	24.6

Source: UNAIDS (2005)

Table 1.4 shows that Zimbabwe is one of the countries in Africa with a high prevalence rate of HIV. In 2003, the rate was 33.7 percent in 2003 and declined to 20.1 percent in 2005 (WHO 2004; UNAIDS 2006). The prevalence rate have been declining in Zimbabwe over the years (UNAIDS 2005). Table 1.4 also shows that Swaziland, Lesotho, South Africa and Botswana had the highest HIV prevalence rate in the region.

Table 1.4. HIV prevalence in Africa 2003 and 2005

Country	HIV prevalence 2003 (%)	HIV prevalence 2005 (%)
Mali	3.3	4.5
Cameroon	-	11
Uganda	4.1	6.7
Ethiopia	4.4	1.4
Rwanda	5.1	5.0
Nigeria	5.4	4.4
Kenya	6.7	6.1
Tanzania	8.8	6.5
Mozambique	12.2	16.0
Malawi	12.4	14.1
Zambia	16.5	19.5
Namibia	21.3	19.6
South Africa	21.5	30.2
Lesotho	28.9	23.2
Zimbabwe	33.7	20.1
Botswana	37.3	33.0
Swaziland	38.8	33.4

Source: WHO (2004); UNAIDS (2006)

1.3. Statement of the Problem

Studies have shown that the population of Africa is increasing at a rapid rate compared to other regions in the world. Sub-Saharan Africa still remains the worst region in the world with high fertility levels and high population growth rate (World Bank 2006). These demographic factors are responsible for the declining economic and social development of most countries in this region (World Bank 2006). One study found that economic resources are growing at such a slow pace such that it is failing to meet the demand of the increasing world population (Tuoane 1995). As a result there is a need to reduce fertility levels in the region. Sub-Saharan Africa is the least developed region in the world (World Bank 2006). However, according to the World Bank (2006) in order for the region to advance economically and socially there is a need to reduce fertility and population growth rates.

Fertility has declined in countries such as Zimbabwe, South Africa and Botswana (Potts and Marks 2001). Although this is the case, fertility is still very high in the region compared to other parts of the world (Thomas and Muvandi 1994). Since fertility contributes significantly to the high population growth rate of a nation it is important to explore the main proximate determinants responsible for the decline in fertility in Zimbabwe from 1988 to 2005.

To achieve this goal it is necessary to understand factors that have influenced fertility decline in Zimbabwe over the years. Studies conducted in Zimbabwe have failed to present a clear picture of the changes in proximate determinants and their impact on fertility from 1988 to 2005. This understanding however is important as it will be possible to identify factors responsible for the decrease in fertility levels since the mid-1980s by presenting an analysis of fertility and its proximate determinants in Zimbabwe. This analysis will however indicate a possible path in which the national population programme can be more effective. In addition it can assist other countries in the sub-Saharan region on a possible path to reduce fertility levels.

1.4. Objective of the Study

The main objective of the study is to examine fertility trends and to assess the role of the proximate determinants in explaining the fertility decline in Zimbabwe.

Specific Objectives

- To examine the change in the total fertility rate in Zimbabwe from 1988 to 2005.
- To determine the principal proximate determinants influencing the fertility decline in Zimbabwe from 1988 to 2005.
- To estimate the fertility-inhibiting effects of four principal proximate determinants of fertility: proportion of women in a marital union, postpartum infecundability, contraceptive use and sterility.

- To identify the variations in the proximate determinants of fertility from 1988 to 2005.

1.5. Organization of the Study

This study has five chapters. Chapter one is the introductory chapter, comprising of the statement of the problem, justification and objectives of the study. Chapter two reviews the literature on the proximate determinants of fertility in Zimbabwe and other countries in the world. Chapter three focuses on the methodology and the data used in the study. Chapter four presents the findings of the study and the implications of the results. Chapter five presents a discussion of the results, conclusion and recommendations.

CHAPTER TWO

LITERATURE REVIEW

2.1. Introduction

This section reviews the literature of the five main proximate determinants of fertility in Zimbabwe. It also review evidence from studies conducted in developed and developing countries in relation to proximate determinants of fertility. Finally, it considers the impact of the HIV/AIDS epidemic on fertility.

2.2. The Fertility Transition

The movement from high to low fertility levels is now common in most countries in the world (Guengant 2002). In comparison to other countries in the world, the fertility transition in sub-Saharan Africa was delayed as a result of a number of factors. In traditional societies, most parents were landowners and as a result children were seen as cheap labor in the fields. Since family planning programmes were not well established in the region this situation also led to high fertility levels. The high infant and child mortality in the region also contributed significantly to high fertility levels (Thomas and Muvandi 1994; Caldwell and Caldwell 2001). The fertility transition of African countries might not be similar to the transition observed in other continents. Frank and Bongaarts (1992) noted that the transition might follow either one of the suggested patterns. The first pattern suggests that fertility will increase first and later decline due to the time spent moving away from customary practices and adopting family planning methods. In the second pattern contraceptive practice may increase for sometime before fertility starts to decline, as women move away from the use of traditional methods. Some studies have shown that Kenya has followed the first pattern while countries such as Botswana, Ghana and Zimbabwe have followed the second pattern (Frank and Bongaarts 1992). This shows that fertility transition patterns may differ from one country to another.

Many studies confirmed that fertility has declined in many sub-Saharan African countries (see, for example: Mturi and Hinde 1994; Caldwell and Caldwell 2001; Kirk and Pillet 1998; Hinde and Mturi 2000). Although this is the case fertility levels are still high compared to other regions in the world (Bongaarts et al. 1984; Thomas and Muvandi 1994). A study observed that the fertility transition has not yet started in 14 countries in sub-Saharan Africa (Guengant and May 2001). The TFR is considerably lower in South Africa compared to other countries in sub-Saharan Africa and East Africa (Swartz 1996). In Western, Middle and Eastern Africa there are countries which have not yet experienced the fertility transition. In addition some countries still experience high fertility rates (Ni-Amoo Doodoo 2001). As a result of these characteristics Loefer and Hertrich (1994) noted that the population of Africa determines the decline of the future population of the world. The transition to low fertility levels in Africa is therefore important since it determines the world's population.

There are a variety of factors that have influenced fertility levels directly and indirectly in most populations. The factors are grouped into proximate or intermediate (biological and behavioral factors) and background (socio-economic, environmental, and cultural) determinants of fertility (Davis and Blake 1956; Bongaarts 1978). It has been established that the fertility transition is not only influenced by the level of development or socio-economic factors such as the level of education and employment status but is influenced mainly by proximate determinants (Guengant 2002). Bongaarts (1978) observed that the fertility levels experienced in different societies is influenced by changes in one or more of the proximate determinants. It can be shown that proximate determinants are the major determinants of fertility reduction in any society.

In support of this Mturi and Hlabana (1999) observed that breastfeeding is responsible for most of the fertility decline in Lesotho. A study conducted by Warren et al. (1992) in Swaziland has shown that postpartum infecundability is the most important determinant of fertility followed by marriage and contraceptive use. In a study conducted in South Korea around the 1960s it was observed that lactational infecundability contributed significantly to fertility reduction. In the 1970s contraception and induced abortion

influenced fertility levels more than other determinants. The TFR was 6.1 births in 1960 and declined to 4.0 births per woman in 1970 (Bongaarts 1978). Fertility levels have continued to decline in South Korea, with studies conducted in the 1990 showing that the rate was 1.6 children per woman. Family planning policies introduced by the government contributed significantly to this rapid change (Barnett and Stein 1998).

In the case of Indonesia both the age at first marriage and contraceptive use contributed significantly to the decline in fertility. The TFR declined from 5.6 births in 1970 to 4.1 births per woman in 1980 (Ni- Amoo Doodoo 2001). In Botswana between 1984 and 1988 breastfeeding was identified as the most significant proximate determinant of fertility, followed by contraceptive use and non-marriage (Majelantle and Letamo 1999). In the case of South Africa family planning methods contributed significantly to fertility reduction (Swartz 1996). These studies prove that proximate determinants have contributed significantly to fertility decline in all populations. Swartz (1996) noted that in most populations marriage and contraception are the two main determinants of fertility.

2.3. Marriage

Marriage is a difficult concept in African societies because it is a process rather than a discrete event and involves rituals, negotiations and transactions that can stretch over years, making it difficult to say at what point a couple becomes married (Arnaldo 2002:148). The definition of marriage tends to differ from one society to the next and it changes over time (Udjo 2001). This situation makes it difficult to compare the impact of marriage in different societies. In most societies marriage is a legitimate and socially sanctioned union tasked with procreation. It is universal and there is a stigma attached to celibacy and delaying marriage (Mhloyi 1987:16). In sub-Saharan Africa marriage patterns are not universal and tend to vary in different countries. In addition there are disparities observed amongst societies within a country (Lesthaeghe 1989). In Zimbabwe there are two main types of marital unions: civil and customary. In Zimbabwe a cohabiting union is also classified as a marital union (CSO 2000). As a result cohabiting is now another form of marital union in Zimbabwe. In Mozambique there are four main

types of marital unions: customary or traditional marriage, religious marriage, civil marriage and mutual consent union or cohabitation (Arnaldo 2001: 146).

Marriage is generally considered the best indicator of exposure to the risk of childbearing (Bledsoe and Cohen 1993:43). There is a direct relationship between fertility and marriage in most populations (South Africa Population Report 2000). Palamuleni et al. (1998) observed that marriage patterns and sexual initiation are procedures that increase a woman's exposure to conception. Riddfuss and Parnell (1989) noted that marriage is a precondition for fertility even when there is no biological connection between the two. In Tanzania, studies have shown that there is a positive association between marriage and childbearing (Central Statistics Office-Tanzania 2005). In Zimbabwe, fertility is indeed highly prized and children are seen as social, cultural and often economic assets (Madziba 2008:6). In addition marriage is positively correlated to childbearing. In Swaziland it is a tradition for childbearing to precede marriage, conception is very early and yet marriage is often delayed (UN 2004:5). In the case of South Africa studies have shown that marriage is late and tends to follow after childbearing (Palamuleni et al. 1998). This shows that in some societies there is no direct relationship between marriage and fertility while in some societies there is a positive association.

Bongaarts et al. (1984) identified different ways in which marriage exposes women to childbearing during the reproductive period. The factors include age at first marriage, age at first birth, proportion of ever married women, level of polygamy, level of spousal separation and remarriage rates (Bongaarts et al. 1984:15). Mhloyi (1988) Bledoe (1990) observed that although separation, divorce and widowhood are common in the sub-Saharan region most women tend to remarry after a short period of time. However it can be observed that in some societies marriage is still an important determinant of fertility.

Fertility is low in societies where women spend most of their childbearing years outside marriage (South Africa Population Report 2000). Studies have shown that married women tend to have more children than unmarried women (South Africa Population Report 2000). It has been documented that amongst married woman contraception is

responsible for fertility reduction. In a traditional society studies have shown that contraception information and use is absent. As a result married women tend to have many children. As knowledge and use of contraception increases married women tend to have fewer children (Bongaarts 1978). In developed countries conjugal fertility is low as a result of a high level of contraception knowledge and use (Bongaarts et al. 1984).

2.3.1. Age at first Marriage

Bloom and Reedy (1987) argue that high fertility rates and population growth are observed in societies where marriage is universal and where age at first union is low. Coale (1992), observed that the fertility transition usually starts when women delay entry into marriage. Knodel (1982) noted that postponement of marriage contributed significantly to low fertility levels during the pretransitional period in Thailand. Coale (1992) observed that the delay in marriage is rooted in the Thai culture in which a man is expected to prove that he can support a family and the woman has to assume primary responsibility for household duties.

Guilkey and Jayne (1997) argue that the delay in marriage is one of the main factors that have contributed to the fertility transition in Zimbabwe. It was observed that some women in Zimbabwe are delaying marriage as a result of education advancement (CSO 2007). The delay in marriage reduces the reproductive years of a woman. In addition it contributes to fertility reduction since few women are exposed to regular intercourse (Guilkey and Jayne 1997). In 1984 about 43 percent of women aged 15-19 years were married while in 1988 the percentage decreased to 18 percent. In addition, about 86 percent of women aged 20-24 years were married compared to 61 percent in 1988 (Guilkey and Jayne 1997). In 1988 and 2005, 63 and 56 percent of women aged 15-49 years were in a union respectively (CSO 1989; 2007). This suggests that women in Zimbabwe started to delay marriage around the 1980s and have continued to delay marriage in 2005. The delay in marriage has also contributed to fertility decline in Navarre between 1986 and 1991 (Sanchez 1998). In Eritrea premarital fertility is

uncommon and as a result the delay in marriage has contributed significantly to fertility reduction (Central Statistics Office-Eritrea 2001).

The decline in fertility has been associated with an increase in age at first marriage and the use of contraceptives (Mhloyi 1992; Guilkey and Jayne 1997; Blanc and Rutenberg 1990). The age at first marriage is an important determinant of fertility since at this stage a woman is exposed to regular intercourse and childbearing. A rise in the age at first union tends to reduce the reproductive period of a woman (Jolly and Gribble 1993; Hinde and Mturi 2000; Bledsoe 1990). Studies have shown that an early mean age at marriage is a necessary but not sufficient condition to lower fertility in sub-Saharan Africa. For example in 1983 TFR was 11.1 births per woman in Rwanda and the mean age at fertility was 21.3 years. However, despite the high mean age at marriage in Rwanda, fertility also remained high due to a short duration of breastfeeding and poor family planning programs (Locoh and Hertrich 1994). In Tanzania the age at first marriage is an important determinant of fertility since there is a close relationship between marriage and fertility (Central Statistics Office-Tanzania 2005). In societies where contraception prevalence is low the age at first intercourse is close to the age at first birth. In societies where contraceptive use is low an early age at marriage can lead to woman having many children (Letamo and Letamo 2001). The age at first marriage is an important determinant of fertility in some societies while it has less impact on fertility in some societies.

In sub-Saharan Africa most marriages are early and common (Lesthaeghe 1989; Jolly and Gribble 1993). This situation has contributed to high fertility levels in the region (Gould and Brown 1996). In the 1980s the age at first marriage in the region was between 16 to 18 years (Jolly and Gribble 1993). Studies have shown that in Mali and Nigeria most women in the 1980s tended to get married at the age of 15.7 years and 19.7 years respectively (Jolly and Gribble 1993). In sub-Saharan Africa the age at first union has increased in most countries in the past few years (van de Walle and van de Walle 1988). In Zimbabwe around the 1980s women were exposed to marriage at an earlier age (CSO 1989). This situation exposed women to regular intercourse at an early age and for many

years before the end of the reproductive period. CSO (1989) observed that in 1988 women aged 20 to 24 years were in union by the age of 19.7 years while women aged 25 to 29 years were in union by age 18.8 years. However in 2005 the age at first marriage decreased to 19.5 years for age group 20 to 24 years and increased for women aged 25 to 29 years to 19.6 years (CSO 2007). In the case of South Africa a study conducted in 1996 has shown that the country has the highest mean age at first marriage in the world of 32.5 years (Udjo 2001). In some countries in Africa the age at first marriage has increased over the years.

In the case of Kenya around the 1980s fertility reduction took place as a result of the increase in the age at first marriage (Frank and McNicoll 1987). A study conducted in Zambia, Zimbabwe and Botswana showed that the age at first union is no longer an important determinant of fertility in these countries since it has been observed that more young women are no longer getting married and some of them are delaying marriage (Letamo and Letamo 2002). In Turkey premarital fertility is almost universal and is an important determinant of fertility. The age at first marriage is a main determinant of fertility since it marks the beginning of exposure to childbearing (Ergocmen and Eryurt 2003). The age at first union is also an important variable since it has contributed to fertility reduction in some populations.

2.3.2. Proportion of Ever Married Women

In Africa marriage used to be common in almost all societies (South Africa Population Report 2000). Jolly and Gribble (1993) observe that in some countries in sub-Saharan Africa more births are now occurring outside marriage. A study conducted in the 1980s amongst 12 countries in sub-Saharan Africa showed that more births are occurring within marriage in Mali and Sudan while in Botswana more women gave birth outside marriage (Jolly and Gribble 1993). In Zimbabwe marriage is still almost universal (CSO 2007). A study conducted in Zambia, Zimbabwe and Botswana showed that more births are occurring outside marriage in these countries (Lemato and Letamo 2002). Mturi and Moerane (2001) observed that premarital fertility is low in Lesotho while in the case of

Botswana studies have shown that it is high. A study conducted in 12 countries in Africa in the 1980s found that in Senegal and Sudan marriage patterns were responsible for fertility reduction (Jolly and Gribble 1993). In some societies, marriage is a significant determinant of fertility.

In the case of South Africa marriage is no longer a direct determinant of fertility. Studies conducted have shown that there is a small difference between the total fertility rate of married and unmarried women in South Africa. It was also observed that teenage pregnancies have contributed to more births outside marriage. Studies have shown that the rate of teenage pregnancies increased from 2.4 percent to 35 percent in 1998 (South Africa Population Report 2000; Chimere-Dan 1999). In this situation marriage is no longer an important determinant of fertility.

2.3.3. Polygamy

In the sub-Saharan region some countries still practice polygamy. In the case of Zimbabwe studies have shown that polygamy is not universal. In 1988 one in every six women were in a polygamous union (CSO 1989). In 2005, approximately 11 percent of the women were in a polygamous union (CSO 2007). Some studies suggest that polygamy tends to reduce a woman's exposure to regular intercourse (Bongaarts et al. 1984). There is a hypothesis which states that women in a polygamy relationship tend to have fewer children compared to women in a monogamous relationship since these women are not frequently exposed to intercourse (Bongaarts et al. 1984). In addition it has been observed that polygamy leads to long periods of postpartum abstinence which is an important proximate determinant of fertility in Africa (Bongaarts et al. 1984). Although marriage has been identified as one of the variables that affects fertility directly, it has been noted that in some societies women tend to spend some of their reproductive years outside a union as a result of divorce, death of a partner and may delay re-marriage (Bongaarts 1978).

2.4. Contraception

In nearly all regions in the world, contraception has been documented to have played a major role in fertility reduction (Bongaarts 1978). Some studies have shown that there is a close connection between fertility decline and contraceptive use in the world (Mhloyi 1992; van de Walle and Foster 1990). Contraception is seen as a deliberate practice undertaken to reduce childbearing (Bongaarts et al. 1984). Some studies suggest that the fertility decline in Kenya, Zimbabwe, Botswana and South Africa were influenced by high contraceptive use (van de Walle and Foster 1990; South Africa Population Report 2000). Studies conducted in Zaire have shown that in 1991 contraceptive use was only 8 percent (Ross et al. 1999). However, contraceptive use is still low in some countries in Africa. It has been observed that in countries such as Morocco, Jordan and Egypt contraceptive use has been increasing gradually over the years (Ross et al. 1999). In most developing countries contraceptive use has increased (Ross et al. 1999). Studies have shown that more than 50 percent of couples in Algeria, Tunisia, Turkey and Iran are using modern methods of contraception (Ross et al. 1999). In the case of Zimbabwe modern methods of contraception played a significant role in the fertility reduction (Mhloyi 1992). In traditional developing societies in which contraceptive use is absent, natural fertility exists (Henry 1961). In this society marriage patterns and postpartum infecundability are principal determinants of fertility and married women tend to have many children. However, in developed countries married women tend to have fewer births since most women use contraception (Henry 1961). In this context contraception is an important determinant of fertility.

The magnitude and the speed of the fertility transition in developed countries compared to developing countries show that contraception is an important determinant of fertility (Pritchett 1994). Contraception has been viewed as the most influential direct determinant of fertility. In societies with a high prevalence rate of contraception, fertility levels are observed to be low (Pritchett 1994). It has been documented that higher levels of

knowledge is not related to high usage of contraceptive methods (Bongaarts et al. 1984). Studies have shown that attitudes to contraceptives vary across regions. In Asia the use of contraception is mainly used to prevent married women with a certain number of children from having more children. However in sub-Saharan Africa, contraceptive use is mainly for child spacing purposes. As a result, contraception is seen to replace postpartum infecundability in sub-Saharan Africa (Caldwell and Caldwell 2001). In sub-Saharan Africa the use of traditional methods is also common in most of the countries. However these methods are not reliable in preventing pregnancy as compared to modern methods (Letamo and Letamo 2002).

In the 1980s the use of contraception was limited in most countries in sub-Saharan Africa. The contraception prevalence rates in Africa excluding South Africa were less than 10 percent (South Africa Population Report 2000). Research suggests that limited socio-economic advancement and a strong cultural opposition contributed to low contraceptive use in the region (Caldwell and Caldwell 2001). This situation led to high fertility levels in the region (Frank and Bongaarts 1991). In the 1980s it was observed that in some countries in the Southern African region fertility started to decline as a result of high contraception rates (Lucas 1992). It was observed that countries such as Botswana, Kenya, Zimbabwe and South Africa had a high contraceptive use during this period (Jolly and Gribble 1993; South Africa Population Report 2000; Guilkey and Jayne 1995). In addition, in sub-Saharan Africa, Zimbabwe and South Africa had more people using contraceptives than other parts of the continent (Guilkey and Jayne 1995). In the case of Botswana and Zimbabwe fertility started to decline in the mid-1980s. Some argue that the efficient and successful use of modern contraception led to this change (Letamo 1996; Locoh and Hertrich 1994). In Zimbabwe and Botswana a strong political will was also responsible for a successful family planning program (Letamo and Letamo 2002). Many studies have shown that the use of contraception in sub-Saharan Africa is slowly increasing in recent years (Guengant and May 2001). The high prevalence of contraception knowledge and use observed in developed countries is mainly responsible for the low fertility rates (Bongaarts 1982; Bongaarts et al. 1984).

Family planning services were not only highly inadequate during the pre-independence period but there were also perceived as a colonial plot to limit the African population in Zimbabwe (Clarke 1972 in Guilkey and Jayne 1997). After 1980 the government continued to promote programmes that increased accessibility of contraception methods to people in the rural and urban areas (Thomas and Muvandi 1994). The Zimbabwe National Family Planning Council (ZNFPC) was responsible for coordinating and mobilizing the distribution of modern methods of contraceptive in the country (Mhloyi 1992; Guilkey and Jayne 1997). In the case of South Africa the government initiated family planning programmes in 1974. The family planning services were without charge to all women in the country (Kaufman 2000).

In 1984, some years after independence the country experienced a small fertility decline while there was a high contraception prevalence rate of 38 percent (Pritchett 1994) and knowledge of contraception was almost universal in Zimbabwe (CSO 1989). However although the prevalence rate of contraception was high, fertility levels were observed to be high in the country at 5.5 births per woman in 1989 (CSO 1989). This situation, however, shows that other determinants of fertility were more influential in the country at this time since a high contraceptive rate is expected to lead to fertility reduction. It was suggested that more women in Zimbabwe at this period used contraception for child spacing and not for stopping a birth (Way et al. 1987). Adamchak and Mbizvo (1990) suggested that during this period family planning methods were used inadequately and as a result had no impact on fertility.

Modern methods of contraception contributed significantly to rapid fertility decline in Bangladesh (Islam and Islam 1993). In the case of the Netherlands around the 1980s the successful use of contraception contributed significantly to the fertility decline (Evert 1983). Studies have shown that marriage and contraceptive use played a leading role in fertility decline in South Africa (South Africa Population Report 2000). The TFR in South Africa in 1988 was 4.5 births per woman (World Bank 1988) and in 1998, TFR was 2.0 births per woman (Palamuleni et al. 1998). A study conducted in Zimbabwe, Zambia and Botswana in 2002 showed that the knowledge and use of modern methods of

contraception has increased since 1980 (Letamo and Letamo 2002). In the case of Zimbabwe the use of contraception increased by 20 percent in 1984 and increased to 40 percent in the mid-1990s (Thomas and Muvandi 1994; Rutenberg and Diamond 1993).

In sub-Saharan Africa and in many countries in the world studies have shown that the fertility decline is influenced mainly by an increase in contraceptive use (Frank and Bongaarts 1992; Caldwell et al. 2001). However this is not the case in Eritrea where fertility has declined while contraceptive use is extremely low. According to the Eritrea Demographic and Health Survey report it has been observed that contraceptive use amongst married women has remained constant at 8 percent. The percentage using contraception is low and cannot be responsible for the recent fertility decline observed in the country (Central Statistics Office-Eritrea 2001). In the case of Ethiopia studies conducted have shown that fertility declined from 6.4 births in 1990 to 5.9 births per woman in 2000. In Addis Ababa the TFR declined from 3.1 births to 1.9 births per woman during the same period. It was observed that fertility declined during this period in the absence of a well planned and successful family planning program. A decrease in the number of married women contributed significantly to the observed fertility rates (Sibanda et al. 2003). In some societies other determinants are more influential in reducing fertility levels than contraception (Tabutin and Schoumaker 2001).

A study conducted by Sibanda (1997) observed that in 1988 and 1994 contraception was the dominant proximate determinant responsible for the fertility reduction in Zimbabwe. In addition he observed that contraception has a great influence on the young and middle aged women (Sibanda 1997). Studies have shown that in 1984 about 83 percent of women had knowledge of a family planning method in Zimbabwe. In 1988 and 1994 it was observed that 96.3 and 98 percent of the women had knowledge of a family planning method respectively (CSO 1995). In 2005 it was observed that knowledge of contraception was universal among single and married women aged 15-49 years. However, among married women, about 99 percent have knowledge of at least one method (COS 2007). The increase in the use and knowledge of contraception contributed to the fertility reduction in Zimbabwe (Guilkey and Jayne 1997).

2.5. Postpartum Infecundability

Postpartum amenorrhoea refers to the interval between childbirth and the return of menstruation (CSO 2007:94). A woman who is not at risk of conception is infecund. Therefore infecundability occurs when a woman is either amenorrhoeic or abstaining from sexual activities (CSO 2007). Studies have shown that in developed Western countries lactation is shorter compared to developing countries in Africa, Latin America and Asia (Bongaarts 1978). In sub-Saharan Africa women tend to abstain from sexual activities and breastfeed for longer periods of time (Jolly and Gribble 1993; Bledsoe 1990). Studies conducted in most African societies have shown that breastfeeding goes along with sexual abstinence since it is believed that sperms will infect breast milk which can poison the baby (Goldman et al. 1987). These practices however are seen as conserving the health of the mother and the new baby (Bledsoe 1990; van de Walle and van de Walle 1988).

Goldman et al. (1987) noted that there are many ways in which a woman can postpone a birth. A woman is exposed to pregnancy only after experiencing a normal pattern of ovulation. Ntozi (2002:5) observed that the suckling by a baby stimulate receptors in the breast nipple resulting in the pituitary gland increasing the production of hormone prolactin. Prolactin inhibits ovulation by reducing hormones needed for ovulation. It has been observed that when the intensity of prolactin decreases beneath a critical level then ovulation will start again (Bongaarts and Potter 1983). The length of lactational amenorrhea is determined primarily by the duration, intensity and pattern of breastfeeding (Jolly and Gribble 1993:73). It has been observed that the longer a woman breastfeeds her child the longer the period of lactational amenorrhea (CSO 2007). However, in some societies a woman may avoid pregnancy by not engaging in sexual activities (Jolly and Gribble 1993).

In sub-Saharan Africa there are disparities in the length of breastfeeding and the length of postpartum abstinence (van de Walle and Omideyi 1988). Studies have shown that in

most countries in the region the length of breastfeeding is longer than the period of postpartum abstinence. Studies conducted in the 1980s found that in Liberia the length of breastfeeding was 17.5 months while in Burundi it was 23.9 months. In addition the length of abstinence varies from 2.4 to 22.7 months in most African countries (Jolly and Gribble 1993). In the case of Lesotho, woman experience long periods of postpartum abstinence which can be more than 15 months (Goldman et al. 1987). It has been shown that postpartum abstinence is 13 months in Botswana, 4 months in Zambia, 6.5 months in Tanzania, 4 months in Uganda and 7 months in Mali (Central Statistics Office-Botswana 1993). Although this variable has contributed to the fertility decline in most West African countries, the impact is low in countries such as Botswana, Uganda and Zimbabwe. In the case of Kenya postpartum infecundability led to fertility decline in 1988 and 1989 (Jolly and Gribble 1993). In sub-Saharan Africa breastfeeding and postpartum abstinence have contributed significantly to fertility decline even when this determinant is not universal (Jolly and Gribble 1993).

In the case of Zimbabwe studies have shown that breastfeeding is almost universal (CSO 1989). Surveys conducted in 1988 and 2005 showed that the median duration of amenorrhea was 12.6 months and 14.3 months respectively while postpartum abstinence was 4.3 months and 2.3 months respectively (CSO 1989; 2007). This shows that the duration of amenorrhea has increased while the period of abstinence has decreased over the years. In addition, postpartum infecundability in the country has declined slightly since 1988. In Zimbabwe a woman who is breastfeeding and abstaining from intercourse after a birth will not be exposed to a pregnancy for about 16 months (COS 2007). Since the median duration of amenorrhea is 14.3 months and postpartum abstinence is 2.3 months. Postpartum infecundability is another proximate determinant contributing to fertility reduction in Zimbabwe since it determines the time frame after a birth in which a woman is not at risk of another pregnancy (CSO 1989). Mturi and Hlabana (1999) observed that breastfeeding was responsible for most of the fertility decline observed in Lesotho. To show that the practice is significant in some societies a man is fined if found having intercourse with another man's wife while breastfeeding in Lesotho (Makatjane and Toebe 1999). Some studies have observed that breastfeeding and abstinence

contribute approximately 37 percent to 44 percent to the fertility decline in Kenya, Ghana, Senegal and Sudan. These studies show that breastfeeding and abstinence still contribute to fertility decline in some societies (Vimard et al. 2001; Jolly and Gribble 1996).

In societies where contraceptive use is low cultural practices such as breastfeeding and postpartum abstinence tend to influence fertility levels (Frank and Mc Nicoll 1987). Although studies have documented that breastfeeding and postpartum abstinence are responsible for the fertility decline, these practices are usually used for child spacing in most African countries (Bongaarts et al. 1984). Bongaarts (1978) observed that breastfeeding delays the next pregnancy and lengthens birth spacing. Anrudh and Bongaarts (1981) observed that normally one month of breastfeeding increases the birth interval by 0.4 months. It has been observed that a woman who is breastfeeding is one quarter to two thirds at risk of conception than a woman who is not breastfeeding (Guz and Hobcraft 1991). The impact of breastfeeding on fertility was observed to be more successful in Lesotho, Ivory Coast, Sudan, Haiti and Ecuador (Guz and Hobcraft 1991).

2.6. Sterility

There are three types of sterility: natural, primary and secondary sterility. Natural sterility normally occurs at the beginning of the reproductive period without a woman being exposed to a sexual transmitted infection (STIs). In primary sterility a woman will not be able to have a child due to exposure to STIs in some cases. While in secondary sterility a woman would have given birth to a child before and became sterile (Bongaarts et al. 1984). Most studies conducted in Africa have shown that STIs such as gonorrhoea and chlamydia are the leading causes of sterility (Bongaarts et al. 1984; Caldwell and Caldwell 1983; Madziba 2008). A study conducted by WHO observed that the impact of STIs on sterility is common to both males and females (Madziba 2008). The STIs cause blockages and wounds in the reproductive pipes when untreated for a long time which will lead to sterility (Madziba 2008).

Some studies conducted in Uganda have observed that HIV infection can cause infertility in some women. It was noted that HIV infected women tend to have a lower fertility rate than HIV negative woman. In addition the same results were observed in Tanzania and Zambia (Kigadye et al. 1993). Some studies have shown that other causes of sterility include unsafe abortion, post-delivery pelvic infections and resistant micro-organisms due to a delay or lack of diagnosis (FHI 2003 cited in Madziba 2008:6)

Bongaarts et al. (1984) observed that at the beginning of the reproductive period a small percent of women will be sterile. However the percent tends to increase with age and can reach 100 percent at the age of 50 years. Sterility is a problem in societies where the percentage of married women who are childless exceed 3 percent (Bongaarts et al. 1984). Bongaarts et al. (1984) identified sterility as one of the principal determinants of fertility in sub-Saharan Africa. Bongaarts et al. (1984) observed that infecundity is high in Central African countries. In Central Africa 20 percent of the women were observed to be barren after their reproductive period. In West Africa few women were observed to be barren compared to Central and East Africa. In Central Africa the fertility transition has not yet started since more women are aware of infertility in the region, and as a result they avoid using family planning methods (Lucas 1992). However in most countries in the Southern Africa region sterility has less influence on fertility compared to East and Central Africa (Bongaarts et al. 1984).

2.7. Induced Abortion

The term abortion refers to the termination of pregnancy before the fetus can survive on its own outside the womb (Ndlovu 2005:7). Studies have shown that yearly 60 to 80 million abortions occur in the world and 20 percent of these abortion cases are not protected. In addition, 95 percent of the cases take place in Third World countries (WHO 1998). A study conducted by WHO observed that induced abortion accounts for approximately 13 percent of all maternal mortality in the world (WHO 1998 in Germain and Kim 1998).

Induced abortion has contributed to fertility decline in most countries in the world. For example, in the United States and Canada, studies have shown that abortion is responsible for the continuous fertility decline (Week 1999). Induced abortion is the most commonly used birth control method. This method is normally used in cases where contraception methods are not available and in cases where it fails to protect a woman from becoming pregnant (Ickis 1987; Weeks 1999). In the case of Zimbabwe, the Ministry of Health and Child Welfare (ZMOH) estimated that between 60 000 and 80 000 abortions occur annually. In 1987 there were 187 abortion cases and this figure increased to 238 in 1992 (Tichagwa and Maramba 1998). Studies have shown that each year there are approximately 4500 induced abortions - one eighth of all pregnancies result in induced abortion (Tichagwa and Maramba 1998). The records obtained from a Harare hospital showed that in 1980 about 265 abortion cases were reported and this increased to 2336 in 1988 (Lovenson et al. 1996). In 1992 about 13767 women were being treated nationally on issues related to abortion (Ministry of Health and Child Welfare 1995 in Lovenson et al. 1996). This shows that abortion rates have increased in Zimbabwe over the years. This situation has contributed to high maternal deaths in the country as a result of the risk associated with unsafe abortions (Johnson et al. 2002).

Studies have shown that in Zimbabwe abortion is one of the leading causes of death among women of the reproductive age group. Induced abortion is still prohibited in Zimbabwe while in countries such as South Africa it is officially authorized by the government (Ndlovu 2005). In 1977 the Zimbabwean government introduced an act that made it possible for a woman to obtain an abortion if the fetus is grossly malformed to an extent that if a child is born from this pregnancy he or she will be seriously handicapped. In addition, an induced abortion is possible in cases where the child is conceived as a result of unlawful intercourse and in a situation in which the pregnancy is a threat to the health of the woman (Ndlovu 2005:18). However the act does not state how to treat pregnant women with HIV/AIDS. The act also states that anyone who does not abide to these conditions will be prosecuted (Ndlovu 2005). According to Fortney and Kiragu (1995) induced abortion can lead to infection, infertility and death. A study conducted

observed that unsafe abortion can lead to long-term physical and mental health problems (WHO 1992 cited in Germain and Kim 1998).

At the 1994 United Nations International conference on Population and Development (ICPD) in Cairo and the Fourth World Conference on Women (FWCW) of 1995 in Beijing an agreement was reached that “abortion should in no case be promoted as a method of family planning” (Germain and Kim 1998). Although studies have shown that abortion is one of the main causes of maternal deaths in developing countries it has been agreed at the international conference that induced abortion should not be supported and considered a family planning method.

2.8. Impact of HIV/AIDS on Fertility

The HIV/AIDS epidemic was common in East and Central Africa during the 1980s and 1990s. In the late 1990s the epidemic was higher in Southern African countries (Ntozi 2002). In the case of Zimbabwe the epidemic was first observed in 1984 (United Nations 2000). It was noted that the epidemic increased rapidly between 1980 and 1990. In the year 2000, a study conducted by UNAIDS (2001) observed that 25 percent of the adults were HIV positive in Zimbabwe. A study has shown that 55 percent of the HIV infected people in the world are women. The effect of HIV on fertility is significant since more women than man are infected (Ntozi 2002).

Studies have shown that HIV can either increase or decrease fertility (Ntozi 2002). As a result of the epidemic, HIV negative women are having more children as an insurance against increased HIV/AIDS related infant deaths (Lewis et al. 2004). Studies have shown that there is a relationship that exists between HIV and fertility reduction in sub-Saharan Africa (Sewankambo et al. 1994). A study conducted in South-West Uganda (Sewankambo et al. 1994; Gray et al. 1998) and in other African countries (Glynn et al. 2000) observed that there is a close association between HIV and infertility. Zaba and Gregson (1998) reviewed six studies conducted in sub-Saharan Africa which showed that HIV lowers the fertility rates of HIV positive women by 25 to 40 percent. Gregson et al.

(1997) argued that there is also evidence to prove that HIV/AIDS has contributed to fertility decline in Zimbabwe. A study conducted in some rural areas in Zimbabwe observed HIV is responsible for at least one quarter of the fertility reduction in the past years (Terceira et al. 2003).

A study in Zimbabwe found that few women have been exposed to HIV testing. As a result most women are not aware of their HIV status (Terceira et al. 2003). A study conducted by Gregson et al. (1998) noted that even if few women are aware of their status they have started to change their behavior by engaging in sexual intercourse at a later stage and using condoms to protect themselves from HIV. He also noted that this change of behavior is mainly for protection against HIV and not to limit fertility.

Ntozi (2002) observed that HIV has an impact on the proximate determinants of fertility. The epidemic has influenced women to postpone the onset of sexual activity and marriage. As a result of the epidemic some women who are already in a union have decided to divorce their unfaithful partners. Studies conducted by Asiimwe-Okiror et al. (1997) and Kamali et al. (2000) in Uganda observed that women are delaying marriage as a result of the epidemic. Focus groups conducted in six district of Uganda noted that women reported that they have delayed entry into marriage as a result of fear of HIV infection (Mukiza-Gapere and Ntozi 1995). A study conducted in Zimbabwe in the Mutasa and Chimanimani provinces of Manicaland observed that young women are delaying marriage as a result of HIV/ AIDS. These women have seen relatives and people in the community dying from HIV (Gregson et al. 1997).

A study has shown that widowed and separated women are finding it difficult to commit themselves to another partner since there are afraid of exposing themselves to the epidemic (Ntozi 2002). A study conducted in Nigeria observed that Yoruba woman are divorcing their husbands, refusing to engage in sexual activities and insisting on using protection when their husband are HIV positive (Orubuloye et al. 1992). These behaviors however reduce a woman's risk to conception and as a result reduce fertility (Ntozi 2002). The studies presented above suggest that HIV is having an impact on marriage

and age at first marriage and intercourse. These variables have a direct impact on fertility reduction.

Studies also confirmed that HIV has an impact on contraceptive use it can either increase or decrease fertility. Ntozi (2002) noted that HIV positive woman may decide to use contraceptives to avoid a pregnancy and infecting the baby. This situation has led to lower fertility rates. In addition some woman may use contraception to avoid re-infection from HIV and STDs. In addition HIV negative women may also use contraceptives to protect themselves from the epidemic (Ntozi 2002). These situations tend to reduce fertility levels. The percentage of HIV positive women using modern contraceptives was 34.5 percent compared to 17.5 percent among HIV negative women in Yaounde, Cameroon (Ntozi 2002:3). A study conducted in Kinshasa, Democratic Republic of Congo observed that 26.4 percent of 238 positive women were using modern contraception compared to 16.3 percent of 315 negative women. A study conducted by Ryder et al. (1991) observed that the epidemic contributed significantly to the use of modern methods of family planning. A study conducted in Zimbabwe observed that 21 percent of the women were using condoms for protection against HIV (Gregson et al. 1997). In the case of Kinshasa a study found that the use of condoms was 17 percent among HIV positive women and 3.2 percent among HIV negative women (Ryder et al. 1991). This shows that HIV influenced women to use contraception which has contributed to fertility reduction.

Studies have shown that the epidemic has influenced breastfeeding and postpartum abstinence patterns in some communities. This situation has led to an increase in fertility levels. In some societies women have avoided breastfeeding since there are aware that it is another way of transmitting the virus to the child (Ntozi 2002). As a result of the epidemic some women have resorted to reducing the number of months abstaining postpartum abstinence in order to avoid extra marital affairs. Ntozi (2002) noted that short periods of breastfeeding and abstinence can lead to higher fertility levels as a woman will be at a higher risk of conception. Gregson et al. (1997) observed that 67 percent of women were aware that mother-to-child transmission can lead to HIV

infection. It was also noted that of those women who were aware of mother-to-child transmission they did not breastfeed their infants. This situation however limits the duration of infecundability amenorrhea and increases fertility rates.

Pathological sterility as a result of HIV has influenced fertility levels (Ntozi 2002). The HIV epidemic is an STD which influences fertility directly and indirectly. A study has shown that HIV-1 can lead to sterility and lower fertility rates. The availability of health care treatment and condom use can reduce STDs leading to an increase in fertility (Ntozi 2002). Leroy et al. (1998) observed that HIV infected women are affected more with STDs than HIV negative women.

Studies conducted in Italy and France has shown that HIV tends to increase unplanned abortions. It has been observed that some women may decide to have an abortion in order to protect the baby from HIV infection, for example in Australia (Ntozi 2002). Studies conducted in Yaounde, Cameroon and Zambia observed that there were more unplanned abortions amongst HIV positive women than amongst HIV negative women (Glynn et al. 2000). In Rakai, Uganda a study showed that 18.5 percent of 130 pregnancies in HIV infected women ended in abortion compared to a lower proportion of 12.2 percent of 861 pregnancies among HIV negative women (Ntozi 2002:8). This shows that HIV has an impact on abortion and fertility levels.

Studies conducted in Zimbabwe have observed that the proportion of married women and contraceptive use have contributed significantly to fertility decline. In addition it can also be noted that there is limited information available on sterility and induced abortion and its impact on fertility in Zimbabwe.

2.9. Summary

In conclusion this section of the paper has presented a comprehensive discussion on the five main proximate determinants, HIV/AIDS and the inhibiting effect of each variable

on fertility. Studies conducted in different countries in relation to these determinants of fertility are also presented.

CHAPTER THREE

THEORETICAL FRAMEWORK AND METHODOLOGY

3.1. Introduction

This chapter presents a model developed by Bongaarts (1987; 1982) and later modified by Jolly and Gribble (1993). The first section of the chapter explores the model first developed by Davis and Blake (1956) and later modified by Bongaarts (1987; 1982); Jolly and Gribble (1993). Bongaart's model identifies eight proximate determinants and some techniques for calculating the inhibitive effect on fertility: proportion of married women, postpartum infecundability, contraceptive use, induced abortion and pathological sterility. The data utilized in this study come from four Demographic and Health Survey (ZDHS) in Zimbabwe.

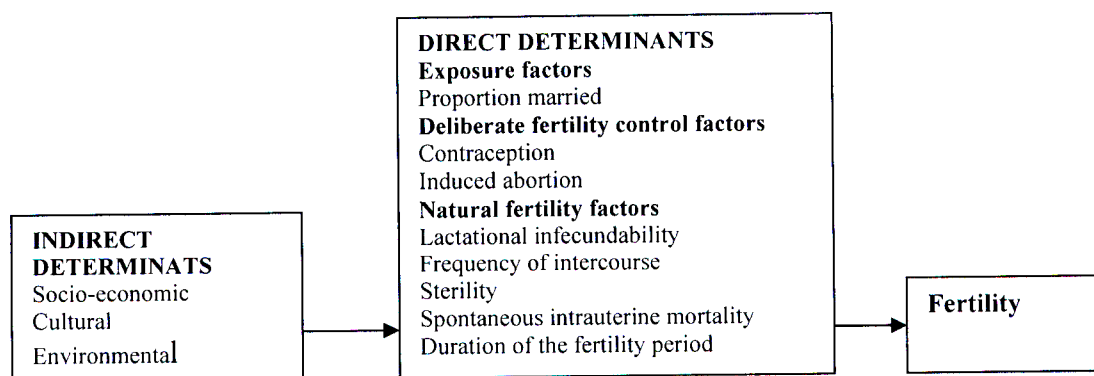
3.2. Background and Conceptual Framework

Davis and Blake (1956) developed the intermediate determinant framework to identify the factors responsible for fertility reduction in any population. The framework identified 11 intermediate determinants of fertility known as "intermediate fertility variables". Davis and Blake (1956) identified intermediate and background determinants which influenced fertility both directly and indirectly (Jolly and Gribble 1993). This framework is an important foundation in the analysis of proximate determinants but it had several setbacks. It is difficult to calculate the proximate determinants as described in the model. For example the age at first marriage was a substitute for risk of conception in the framework. It has been noted that in most societies marriage is not an incident; it involves a series of rituals (Arnaldo 2002). In additions conception in some societies goes before

marriage, for example in Swaziland (UN 2004). This makes it difficult to determine the exact point at which the risk of conception began. In addition data on coital frequency is very incomplete and if accessible it is not consistent. As a result of the problems identified above and other issues, many researchers introduced different models in trying to compute proximate determinants of fertility.

Bongaarts (1987; 1982) is one of the researchers who restructured the framework to include the proximate determinant framework and a technique for evaluating the impact of each proximate determinant on fertility. The model introduced the term proximate determinant which is also referred to as intermediate determinants (Mostert et al. 1998). The model is an integration of the proximate or intermediate determinants and the background determinants. Bongaarts (1987) also supported the notion that intermediate or proximate determinants are variables that influence fertility directly. Bongaarts (1987) identified eight proximate determinants which are divided into three broad categories. Firstly, exposure factors (proportion married), secondly, deliberate fertility control factors (contraception, induced abortion) and finally, natural fertility factors (lactational infecundability, frequency of intercourse, sterility, spontaneous intrauterine mortality and duration of the fertility period).

Figure 1: Determinants of fertility



Source: Bongaarts (1987)

The background or indirect determinants are variables that operate under the proximate variables or direct determinants, which in turn influences fertility (Jolly and Gribble 1993). These indirect determinants include socio-economic, cultural and environmental factors (Bongaarts 1987). Both proximate or intermediate determinants and background determinants influence fertility directly and indirectly respectively. This study will focus on the proximate determinants since these variables have a direct impact and are responsible for fertility decline in any population.

Bongaarts (1982) conducted a study using data from 41 countries. The study showed that 96 percent of the differences in fertility rates are influenced mainly by the time spent in a marital union, the practice of contraceptive methods, the prevalence of induced abortion, and postpartum infecundability. Bongaarts (1982) observed that in these countries fertility is influenced mainly by these four main proximate determinants. Although Bongaarts identified eight proximate determinants, he also noted that there are some proximate determinants which have less impact on fertility (Bongaarts 1982). Bongaarts et al. (1984) later observed that in sub-Saharan Africa the decrease in fertility is influenced by five main proximate determinants: proportion of women married, postpartum infecundability, contraceptive use, induced abortion and pathological sterility.

The study will draw on the model developed by Bongaarts (1987; 1982) and the modifications introduced by Jolly and Gribble (1993). As in most African countries, statistics on abortion are scarce and unreliable since abortion is illegal. In the case of Zimbabwe it is difficult to make an evaluation or analysis of the contribution of abortion to the fertility decline. As a result this study will focus on the four main proximate determinants of fertility.

3.2.1. Analytical Framework

To compute the fertility-inhibiting effect of the proximate determinants Bongaarts, (1987) developed a model for evaluating the impact of each proximate determinant on fertility. Bongaarts (1987) developed a technique that computes TFR as a product of the

multiplication of the following indices: total fecundity (TF), proportion of women married (C_m), postpartum infecundability (C_i), contraceptive use (C_c), induced abortion (C_a) and pathological sterility (I_p). TF is the hypothetical estimated number of children a woman will have during her reproductive years under the condition that marriage, contraception, breastfeeding and postpartum abstinence, induced abortion is absent. He came up with an average of 15.3 for total fecundity rate (Bongaarts 1982). The following equations are utilized to compute indices introduced by Bongaarts (1987; 1982).

$$\mathbf{TFR = TF * C_m * C_i * C_c * C_a} \quad \mathbf{(1)}$$

$$\mathbf{TM = C_i * C_c * C_a * TF} \quad \mathbf{(2)}$$

$$\mathbf{TN = C_i * TF} \quad \mathbf{(3)}$$

Where,

TFR is the number of births a woman would have at the end of the reproductive years if she were to bear children at prevailing age-specific fertility rates while living throughout the reproductive period (Bongaarts 1987: 5).

Total marital fertility rate (TM), is the number of births a woman would have at the end of her reproductive year if she were to bear children at the prevailing age-specific marital fertility rates and remain married during the entire reproductive period (Bongaarts 1987:5).

Total natural marital fertility rate (TN), is observed under conditions in which contraception and abortions are eliminated (Bongaarts 1982).

Bongaarts (1982) noted that whilst TFR, TM and TN vary in many populations, total fecundity rates are virtually constant in all populations.

Total Natural Fecundity Rate (TF)

The index is estimated as:

$$TF = TFR / (C_m * C_i * C_c * C_a)$$

Where,

C_m , C_i , C_c , and C_a are indices of marriage, postpartum infecundability, contraception and induced abortion respectively. The indices can only take values between 0 and 1. Where there is no fertility-inhibiting effect of a given intermediate fertility variable, the corresponding index equals 1, and when the fertility inhibition is complete, the index equals 0 (Bongaarts 1982). It is important to note that since abortion is illegal in Zimbabwe and there is limited and unreliable information available, the index of abortion in this study will be 1 as the index is difficult to compute. Therefore the contribution of abortion to fertility will be nil.

These indices are estimated using the formula given below

The Index of Marriage

The index of marriage is calculated as:

$$C_m = \frac{\sum \{m(a) * g(a)\}}{\sum g(a)} \quad (4)$$

Where,

$m(a)$ = age specific proportions currently married.

$g(a)$ = age specific marital fertility rates.

or,

$$C_m = \text{TFR} / \text{TM}$$

Where,

TM = Total marital fertility rate

C_m assumes that all births occur within marriage.

The index of Contraception (C_c)

The index of contraception is calculated as:

$$C_c = 1 - 1.08 * u * e \quad (5)$$

Where,

u = average proportion of married women currently using contraception.

e = average contraceptive effectiveness.

The Index of Postpartum Infecundability

The index of postpartum infecundability is calculated as:

$$C_i = 20 / (18.5 + i) \quad (6)$$

Where,

i = average duration (in months) of infecundability from birth to the first postpartum ovulation (menses).

This study will calculate postpartum infedundability using this model since some of the data is not available in the ZDHS of 1988 to compute the index using the model suggested by Jolly and Gribble (1993). Since this study will compare the results obtained in the four different years it is important to compute an index using the same formula.

The Index of Sterility

$$I_p = (7.63 - 0.11s)/7.3 \quad (7)$$

Where,

s = is the percentage of ever-married women between ages 45-49 years who have ever been married but never had any children.

I_p operates under the assumption that by age 40 years nearly all would have given birth.

3.2.2. The Model introduced by Jolly and Gribble 1993

This section of the paper present the suggestions introduced by Jolly and Gribble (1993) to compute the indices.

The Index of Marriage

The index of marriage is calculated as:

$$C_m = \frac{\text{Total fertility rate (TFR)}}{\text{Total marital fertility rate (TMFR)}}$$

Where,

TFR = is the average total number of births a woman would have in her lifetime at current age-specific fertility rates.

TMFR = is the average total number of births a woman in union from 15 to 49 would have at current age-specific marital fertility rates (Jolly and Gribble 1993:103).

The TMFR assumes that all births occur in a marital union. However the assumption has some limitations since in most parts of Africa some births are occurring outside marriage (Chimere-Dan, 1999). Jolly and Gribble (1993) observed that the assumption introduced by Bongaarts will pose a lot of problems. Jolly and Gribble (1993) also realized that if non-marital births are excluded from the analysis the TFR will be undervalued while total marital fertility rate will be estimated correctly. However if these births are included in the equation, the TFR will be accurate (Jolly and Gribble 1993).

Jolly and Gribble (1996) maintained a consistent definition of other variables developed by Bongaarts, Jolly and Gribble (1993) and introduced two variables, M_o and C^l_m . M_o are births that occurs outside marriage while C^l_m are those births that occurs within marriage and C_m is the product obtained from the two indices. However C^l_m is a modified version of C_m which maintains the assumption that all the births occurred within marriage. The product of M_o and C^l_m is C_m (Jolly and Gribble 1993). These two indices are related since if women aged 15 to 49 years do not give birth outside marriage, M_o would be equal to 1.

Therefore births outside marriage are computed as:

$$M_o = \frac{\text{TFR}}{\text{TUFR}}$$

C^l_m is also calculated as follows:

$$C^l_m = \frac{\text{TUFR}}{\text{TMFR}}$$

Where,

Total union fertility rates (TUFMR) is obtained by calculating the sum of the age-specific union fertility rates (ASUFR). TMFR is the average total number of births a married woman aged 15 to 49 years would have at current age-specific marital fertility rates (Jolly and Gribble 1993:103). The TUFMR assumes that no divorce or separation will take place to women who are married. Mhloyi (1988) noted that in some African societies women tend to remarry after a short period of time.

The ZDHS in 1999 and 2005 has classified cohabitation as a marital union in Zimbabwe (CSO 2000). This was not the case in 1988 and 1994 since no information was collected on this variable. The ZDHS in 1999 and 2005 classifies married and cohabiting women in two different categories. This study will consider couples married and not cohabiting when computing TFMR since there is no information available on cohabiting women in 1988 and 1994. Since this study will compare the results obtained in the four different years from 1988 to 2005 it is important to compute an index using the same information. The study will utilize this model to compute the index of marriage since it considers births which have occurred outside marriage. The four DHS conducted in Zimbabwe have shown that some births are occurring outside marriage (CSO 1989; 1995; 2000; 2007).

The Index of Contraception

The index of contraception introduced by Bongaarts (1987; 1982) is the same index used by Jolly and Gribble (1993). However, the following standard use effectiveness levels introduced by Jolly and Gribble 1993 are used: female sterilization = 1.00, IUD = 0.95, Pill = 0.90, other methods = 0.50 and traditional methods = 0.50. These use effectiveness levels are used in this study since there are more recent than the use effectiveness levels in the Bongaarts model.

The Index of Postpartum Infecundibility

The index of Postpartum Infecundibility introduced by Bongaarts (1987; 1982) is the same index used by Jolly and Gribble (1993). i = mean number of months of postpartum infecundibility (estimated as the mean number of months of postpartum amenorrhea or abstinence, whichever is longer) for women in marriage. According to Jolly and Gribble (1993:105) i is the period of non-susceptibility, calculated as the number of mothers either amenorrheic or abstaining at the time of the survey (prevalence) divided by the average number of births per month over the last 36 months (incidence).

The Index of Primary Sterility

The index of sterility is estimated as:

$$C_p = (7.63 - 0.11s)/7.3$$

Where,

s = proportion of married women between the ages of 40 to 49 years who have never had a child on the assumption that all women must have had their first birth by 40 years. Although Bongaarts (1987) in his model used the percentage of childless women aged 45-49 years. Jolly and Gribble (1993) recommended the ten-year age group which will be used instead of the five year age group developed by Bongaarts. The study will use this model to compute the index of sterility since the ten-year age group will increase the percentage of women evaluated and decrease the error in calculating sterility.

3.2.3. Limitations of the Models used

This model does not examine the impact of HIV/AIDS on fertility. Some studies have shown that HIV/AIDS has influenced the fertility decline in Zimbabwe (Gregson et al. 1997; Terceira et al. 2003). Since the ZDHS for the years 1988, 1994 and 1999 did not include information on HIV/AIDS, it is not possible to analyze the impact of HIV/AIDS on fertility.

3.3. Sources and Nature of Data

This study draws information from quantitative data. The study utilizes individual-level data from four ZDHS: the 1988, 1994, 1999 and 2005. These surveys are conducted within the framework of the Zimbabwe National Household Survey Capability Programme (ZNHSCP). The sample design which forms the basis of the study is based on the Zimbabwe master sample which is obtained from the population census. The samples almost represent the national population of Zimbabwe. The surveys were conducted for the different years to provide updated estimates of current demographic and health data in Zimbabwe (CSO 2007).

The samples for the different years are developed by the Central Statistics Office (CSO) in partnership with the Institute for Resource Development (IRD) and Macro International. These surveys are large and have been conducted in most countries in the world since the mid-1980s. The surveys provide comprehensive information on fertility, child mortality levels and trends, fertility preference, knowledge, approval and use of contraceptives, marriage status, postpartum infecundability and sterility. In addition, these surveys also gather socio-economic and environmental information in the country (CSO 2007). The surveys can be used to compare demographic and health indicators amongst different countries. A section of the data collected from the 1988, 1994, 1999 and 2005 ZDHS permits an evaluation and computation of the impact of the proximate determinants on fertility.

In 1988 the sample was systematically drawn from the 1987 intercensal demographic survey. In 1994 and 1999 the samples were obtained from the 1992 population census while the 2005 sample was drawn from the 2002 population census. The Zimbabwe demographic and health surveys went through a two-stage sample design. In 1988 the census enumeration areas (EA) served as the first stage of the sampling technique. A total of 167 EAs were selected: 114 in the rural areas and 53 in the urban areas. The second sampling stage prepared a households listing from the selected EAs. A total of 4201 women from both rural and urban were interviewed.

In 1994, 1999 and 2005 the samples were stratified by land use and by province. In terms of land use the samples were grouped into rural and urban strata and were collected from ten provinces in the country. Harare and Bulawayo provinces were grouped into the urban strata while the other 8 provinces were grouped into the rural strata. In addition the sampling areas were grouped according to land use: communal, large scale farming, urban, semi urban, small scale farming and resettlement. In the first sampling stage of the sampling method in 1994 and 1999, the 395 EAs identified from the 1992 population census were used to systematically select 230 EAs in an equal probability. The second sampling stage prepared a household listing from the selected EAs. In 1994 and 1999 a total of 6,128 and 5,907 women were interviewed respectively. In the first sampling stage in 2005, 1200 EAs were systematically selected. In the second sampling stage random selection was used to obtain a household list. A total of 8,907 women from both rural and urban were interviewed. The surveys only interviewed women aged 15 to 49 years. This study will use data collected from women aged 15-49 years since the technique employed focuses on these age groups. This study however is only limited to married and single women.

Table 3.1 below shows that the survey response rates were not the same over the different years. The highest response rates were observed in 1994. In addition the lowest rate of 90 percent was observed in 2005. In general, the responses rate in the four surveys is over 90 percent.

Table 3.1. Survey responses rate in percentage from 1988 to 2005

Year	(%)
1988	94.0
1994	96.0
1998	95.2
2005	90.0

Source: CSO (1989); (1995); (2000) ;(2007)

3.3.1. Limitations of Data and Research Strategy

The ZDHS considers a percentage of the Zimbabwean population to represent the whole population. Maxwell (1998) notes that in general quantitative methods can be used to draw statistical inference that is, drawing empirical conclusions about the entire population based on a sample. This is a limitation since the sample interviewed may fail to represent the entire population. The data will certainly suffer from a sampling error. The improvement of the data quality between the 1988 and 2005 could bias the results when comparing the datasets for the different years. The 2005 survey included issues pertaining to HIV/AIDS which were not included in the other surveys. This situation will make it difficult to compare issues pertaining to HIV/AIDS in the other years. However, one would assume that HIV/AIDS has contributed significantly to fertility levels in the country.

There is a lack of reliable data on induced abortion since it is still illegal in Zimbabwe thus making data collection very difficult. This study will only focus on four of the five main proximate determinants of fertility identified by Bongaarts et al. (1984). The other limitation of the study is that it only focuses on females and no analysis is computed on males.

3.4. Summary

In conclusion this section of the paper presents a comprehensive discussion of the model introduced by Bongaarts (1987; 1982) and later modified by Jolly and Gribble (1993). The sources of data utilized in this study and the limitation are also presented in this chapter.

CHAPTER FOUR

Research Findings

4.1. Introduction

This chapter presents the findings obtained from the analysis of data from four Demographic and Health Surveys conducted in Zimbabwe. The first part of this chapter describes the background characteristics of the sample. The chapter further presents an examination of the impact of four proximate determinants of fertility: marriage, contraception, postpartum infecundability and sterility.

4.2. Description of the Sample

Table 4.1 presents a review of the characteristics of respondents in the four surveys. These socio-economic characteristics of the respondents assist in analyzing and explaining the findings of the study. Table 4.1 presents a summary of the age of respondent, place of residence, marital status, levels of education and employment status.

This study focuses on women aged 15 to 49 years. The sample utilized in this analysis consists of 4201 women in 1988, 6128 women in 1994, 5907 women in 1999 and 8907 women in 2005. Table 4.1 shows that the percentage distribution of the respondents in the different age groups is almost equal in all four Demographic and Health Surveys analyzed. In all four surveys the majority of women interviewed were aged 15 to 19 years. Women aged 15 to 19 years constituted 24.3 percent of women in 1988 and 23.9 percent in 2005. In all four surveys the percentage of women aged 40 to 49 years was low compared to other age groups. Women aged 40 to 44 years constituted 7.6 percent in 1988 and 8.1 percent in 2005. The majority of women interviewed in all four surveys were relatively young. Table 4.1 also shows that more than half of the respondents (66.5

percent in 1988, 71.5 percent in 1994, 69.4 percent in 1999 and 64 percent in 2005) reside in the rural areas. CSO (1989) noted that approximately 70 percent of the people in Zimbabwe live the rural areas. This reflects the current situation in Zimbabwe the majority of the population resides largely in the rural areas.

Table 4.1. Socio-economic characteristics of the sample from 1988 to 2005

Background Characteristics	1988		1994		1999		2005	
	N	%	N	%	N	%	N	%
Age								
15-19	1021	24.3	1486	24.2	1468	24.9	2130	23.9
20-24	840	20.0	1231	20.1	1232	20.9	1945	21.8
25-29	679	16.2	911	14.9	1011	17.1	1439	16.2
30-34	589	14.0	876	14.3	650	11.0	1212	13.6
35-39	464	11.0	666	10.9	672	11.4	843	9.5
40-44	318	7.6	542	8.8	492	8.3	719	8.1
45-49	290	6.9	416	6.8	382	6.5	619	6.9
Place of Residence								
Urban	1407	33.5	1745	28.5	1809	30.6	3203	36.0
Rural	2794	66.5	4383	71.5	4098	69.4	5704	64.0
Marital Status								
Never Married	1133	27.0	1663	27.1	1683	28.5	2452	27.5
Married	2643	62.9	3777	61.6	3130	53.0	4979	55.9
Widowed	105	2.5	208	3.4	249	4.2	660	7.4
Divorced	320	7.6	478	7.8	196	3.3	381	4.3
Living together	-	-	-	-	423	7.2	139	1.6
Not living together	-	-	-	-	-	-	296	3.3
Education levels								
None	566	13.5	712	11.6	437	7.4	380	4.3
Primary	2349	55.9	2961	48.3	2518	42.6	2971	33.4
Secondary	37	29.7	2377	38.8	2803	47.5	5297	59.5
Higher	37	0.9	78	1.3	149	2.5	259	2.9
Currently Working								
Yes	1410	33.6	3163	51.6	2826	47.8	3264	36.6
No	2788	66.4	2959	48.3	3081	52.2	5628	63.2

Sources: CSO (1989; 1995; 1999; 2007)

N.B total may not tally because of missing cases

The percentage of never married women increased very slightly over the past few years. Table 4.1 shows that the percentage of never married women increased very slightly from 27 percent in 1988 to 27.5 percent in 2005. The percentage of married women has been declining over the years. In the case of married women, the percentage declined from 62.9 percent in 1988 to 55.9 percent in 2005. Table 4.1 also shows that in Zimbabwe more than half of the women are married in all the four surveys. This situation shows that marriage is still important and valued in Zimbabwe. In addition table 4.1 shows that marriage is relatively high in Zimbabwe. The number of widowed women has also been increasing over the years while the percentage of divorced women has been decreasing over the years. The percentage of widowed women increased from 2.5 percent in 1988 to 7.4 percent in 2005. The percentage of divorced women decreased from 7.6 percent in 1988 to 4.3 percent in 2005.

Table 4.1 shows that there have been some improvements in the educational level. The percentage of women with no education has declined over the years. In 1988, 13.5 percent of women reported having no education and the percentage declined to 4.3 percent in 2005. In 1998 55.9 percent of women reported having only primary school education and the percentage declined to 33.4 percent in 2005. Educational levels appear to be improving. In 1988, 29.7 percent of women reported having secondary education and the percentage rose to 59.5 percent in 2005. In 1988, 0.9 percent of women reported having higher education and the percentage increased to 2.9 percent in 2005. Table 4.1 also shows that the employment status of women had not changed dramatically between 1988 and 2005. In 1988, only a third of women were working and in 2005, only 36.6 percent were working. However, it is worth noting that between 1994 and 1998 there was a large percentage of women who were currently employed. The percentage of women who were currently employed in 1994 was 51.6 percent and in 1999 it was 47.8 percent. This shows that more women were unemployed than employed in the surveys analyzed. CSO (1989) observed that approximately 75 percent of the economically active people in Zimbabwe are unemployed. This suggests that unemployment is a major problem in Zimbabwe.

4.3. Fertility Levels and Trends

Table 4.2 presents the age specific fertility rates and total fertility rates of women in Zimbabwe from 1988 to 2005. An examination of the current trends of the age specific fertility rate and TFR presents the demographic evolution in Zimbabwe from 1988 to 2005. Table 4.2 and Figure 4.1 show the number of births per thousand women from 1988 to 2005. According to Table 4.2, age specific fertility rates have been declining over the years in almost all age groups with the exception of the following groups: 15 to 19 years in 1999, 20 to 24 years, 30 to 34 years in 2005 and 45 to 49 years in 1999.

Table 4.2 shows that the highest level of age specific fertility rate is among women aged 20 to 24 years in all the four surveys except for age group 25 to 29 years in 1988. The age specific fertility rate for age group 20 to 24 years was 247 births in 1988, 210 births in 1994, 199 births in 1999 and 205 births per 1000 women in 2005. This shows that women of the age group 20 to 24 years were having more births than women of other age groups. Most women have their children between the ages of 20 and 34 years. After age 34 the fertility rate begins to decline. Table 4.2 further shows that women of the age group 20 to 29 years are having more births compared to women of age group 40 to 49 years. In addition some women still continue to give birth at age group 40 to 44 years and 45 to 49 years. Table 4.2 further shows that the TFR declined from 5.5 births to 3.8 births per women between 1988 and 2005. The TFR declined more rapidly between 1988 and 1994 from 5.5 to 4.3 births per women respectively. It can be noted that from 1988 to 2005 fertility declined by about 1.7 births.

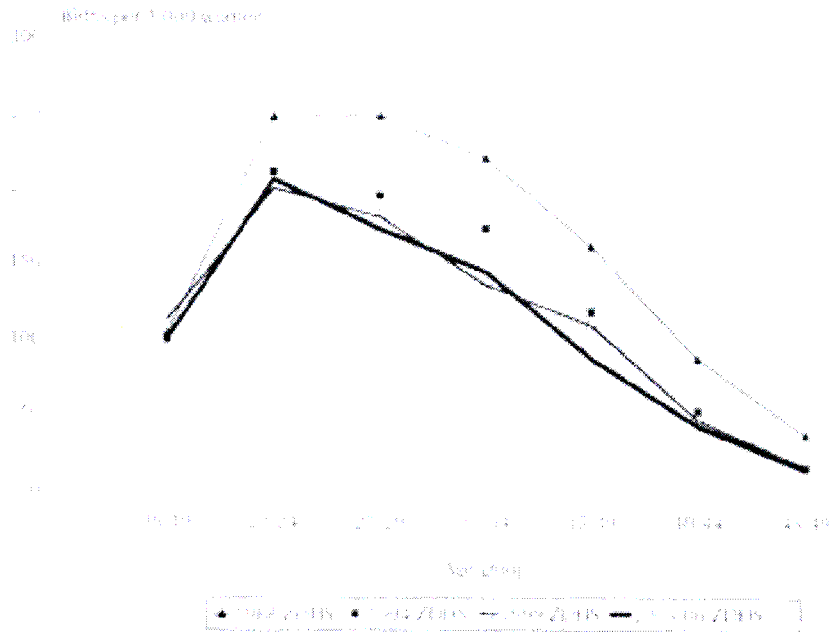
Table 4.2. Age-specific fertility rates and total fertility rates, Zimbabwe 1988-2005

Age Group	1988 ZDHS (1984-88)	1994 ZDHS (1991-94)	1999 ZDHS (1996-99)	2005 ZDHS (2004-2005-06)
15-19	103	99	112	99
20-24	247	210	199	205
25-29	247	194	180	172
30-34	219	172	135	144
35-39	160	117	108	86
40-44	86	52	46	42
45-49	36	14	15	13
TFR 15-49	5.5	4.3	4.0	3.8

Source: CS0 (2007)

Figure 4.1 shows fertility trends by age group of women from 1988 to 2005 in Zimbabwe. Figure 4.1 shows that the age specific fertility rates were low for the age group 15 to 19 years and reached a peak for the age group 20 to 24 years in all the four surveys. Figure 4.1 shows that in all the four surveys the fertility of women was lower for the age group 15 to 19 years and reached a peak at age group 20 to 24 years. The age specific fertility rate started to decline after age 25 in all the four surveys. However, Figure 4.1 shows that in 1988 for age groups 20 to 24 years and 25 to 29 years the age specific fertility rate was 247 births. This shows that the age specific fertility rate did not change as observed in other age groups.

Figure 4.1 Trends in current fertility rates, Zimbabwe 1988-2005



Source: CSO (2007)

4.4. Proximate Determinants of Fertility

This section of the paper explores the factors directly responsible for fertility decline in Zimbabwe. Davis and Blake (1956) referred to these factors as “intermediate fertility variables”. Bongaarts et al. (1984) later identified five main direct factors responsible for fertility reduction in sub-Saharan Africa. These variables will be analyzed in this section of the chapter to improve understanding of the factors that contributed to the fertility decline in Zimbabwe from 1988 to 2005. This paper will not present an analysis of abortion since there is limited data available in the country on abortion.

4.5. Marriage Patterns

This section of the chapter explores the impact of marriage on fertility. Since there is a strong relationship sexual initiation and fertility, this analysis explores the age at first

marriage, age at first birth, age at first intercourse and the proportion of women in a union. Mahy and Gupta (2002) support this position noting that high fertility levels in sub-Saharan Africa are influenced by the age at first birth, age at first union and age at first intercourse. This paper will investigate the impact of some of these variables on fertility in Zimbabwe.

Tables 4.3 present the percentage distribution of married women by age.

Table 4.3. Marital status by age groups in 1988		
1988	Never Married	Married
15-19	80.2	17.6
20-24	28.5	61.1
25-29	6.8	82.3
30-34	2.5	85.4
35-39	1.5	86.9
40-44	0.9	79.6
45-49	1.4	80.0
1994		
15-19	79.4	18.4
20-24	28.0	63.1
25-29	8.6	78.5
30-34	3.9	81.7
35-39	1.1	80.8
40-44	2.8	80.4
45-49	1.0	77.6
1999		
15-19	78.6	17.4
20-24	30.0	52.1
25-29	10.5	67.0
30-34	3.4	71.5
35-39	2.8	69.9
40-44	1.6	73.0
45-49	1.0	68.6
2005		
15-19	78.2	18.9
20-24	29.2	58.8
25-29	9.1	74.1
30-34	3.9	75.2
35-39	3.4	66.7
40-44	0.7	68.3
45-49	1.1	64.9

Tables 4.3 show that the percentage of never married women has declined from 1988 to 2005. In 1988 the percentage of never married women was 80.2 percent for the age group 15 to 19 years and it declined to 1.4 percent for women in the age group 45 to 49 years. The percentage of never married women in the age group 15 to 19 years was 80.2 percent in 1988, 79.4 percent in 1994, 78.6 percent in 1999 and 78.2 percent in 2005 and it declined to 1.4 percent in 1988, 1 percent in 1994 and 1999 and 1.1 percent in 2005 for women in the age group 45 to 49 years. Tables 4.3 show that the percentage of never married women has been declining with increasing age while the percentage of married women is increasing with age. Tables 4.3 show that marriage is relatively high among women aged 20 to 49 years since more than half of the women are married. However, the percentage of married women aged 45 to 49 years in the survey declined from 80 percent in 1988 to 64.9 percent in 2005.

4.5.1 Age at First Marriage

The age at first marriage is defined as the age at which the respondent began living with her first spouse (CSO 2007:86). In most societies marriage is viewed as the stage at which a woman is exposed to sexual activities and child bearing. Women who are married at an early age are exposed to child bearing for a longer period than women who get married later in life (CSO 2007). Some studies have shown that there is a strong correlation between age at first marriage and fertility (Mhloyi 1992; Guilkey and Jayne 1997; Blanc and Rutenberg, 1990). This section of the paper will explore the age at first marriage as one of the indicators for measuring marriage.

Table 4.4 indicates the age at first marriage and the percentage distribution of women never married by age group from 1988 to 2005.

Table 4.4. Age at first Marriage

Current Age	15	18	20	22	25	% Never Married
1988						
15-19	16.3	17.8	0	0	0	80.2
20-24	6.5	13.0	10.5	5.2	0	28.5
25-29	7.6	14.4	8.4	5.5	1.6	6.8
30-34	8.2	15.5	6.8	4.5	1.2	2.5
35-39	5.0	12.7	10.5	5.0	2.8	1.5
40-44	10.5	10.5	8.3	3.5	1.9	0.9
45-49	11.5	10.1	8.4	5.2	0.7	1.4
1994						
15-19	15.0	20.3	0	0	0	79.4
20-24	7.9	14.3	11.7	3.3	0	28.0
25-29	6.8	13.4	11.4	6.7	3.1	8.6
30-34	7.1	12.9	8.8	5.6	2.3	3.9
35-39	7.7	11.8	9.1	6.1	0.9	1.1
40-44	8.2	14.4	8.2	5.1	2.8	2.8
45-49	8.0	10.4	10.0	5.1	1.7	1.0
1999						
15-19	16.9	17.5	0	0	0	78.6
20-24	7.0	17.6	11.3	5.2	0	30.0
25-29	6.1	11.5	11.0	6.6	3.3	10.5
30-34	5.1	14.0	9.4	8.1	2.9	3.4
35-39	6.3	15.0	7.5	4.4	2.5	2.8
40-44	6.0	11.6	12.0	5.2	0.8	1.6
45-49	6.1	15.1	10.6	3.7	1.3	1.0
2005						
15-19	17.0	17.8	0	0	0	78.2
20-24	8.6	15.1	9.6	4.1	0	29.2
25-29	5.7	13.6	11.9	5.5	2.7	9.1
30-34	6.8	12.4	9.4	5.6	3.3	3.9
35-39	5.7	10.4	10.4	5.7	3.1	3.4
40-44	8.1	12.3	9.1	4.5	2.0	0.7
45-49	6.5	14.4	10.5	4.7	1.5	1.1

Table 4.4 shows that the age at first marriage has increased slightly over the years. For example for the age group 25 to 29 years the percentage married at age 20 was 8.4 percent in 1988, 11.4 percent in 1994, 11.3 percent in 1999 and 11.9 percent in 2005. The percentage of women married at age 15 increased slightly in all the four surveys analyzed. In 1988 and 2005 the percentage was 11.5 percent and 6.5 percent among women aged 44 to 49 years and increased to 16.3 percent and 17 percent among women aged 15 to 19 years.

The mean age at first marriage was 18.1 years in 1988, 18.5 years in 1994, 18.8 years in 1999 and 18.6 years in 2005. The mean age at first marriage suggests that the age at first marriage has increased slightly in Zimbabwe. Table 4.4 shows that many women in Zimbabwe still enter into marriage at an early age. As a result, the percentage of married women is still high in the country. These results show that there was a slight increase in the age at first marriage from 1988 to 2005.

4.5.2 Age at first Birth

Table 4.5 presents the distribution of women by age at first birth from 1988 to 2005.

Table 4.5. Age at first birth						
Current Age	15	18	20	22	25	% who have never given birth
1988						
15-19	12.7	24.1	0	0	0	83.7
20-24	4.2	15.9	12.5	6.7	0	28.8
25-29	4.4	14.1	13.5	6.2	1.0	7.2
30-34	5.6	11.6	11.8	5.3	2.3	3.7
35-39	3.5	12.6	13.0	5.3	2.2	2.2
40-44	9.4	8.7	10.3	6.8	2.3	2.5
45-49	3.9	7.9	7.5	8.9	0.7	3.4
1994						
15-19	11.9	18.2	0	0	0	84.1
20-24	6.9	18.2	13.6	5.0	0	29.5
25-29	4.7	13.0	11.4	7.1	3.0	7.5
30-34	5.1	13.4	13.2	6.1	1.9	3.4
35-39	4.6	14.7	12.1	6.3	3.1	1.8
40-44	5.7	13.4	12.3	6.6	2.1	2.2
45-49	4.9	13.1	9.5	6.1	3.4	1.2
1999						
15-19	10.6	24.3	0	0	0	82.6
20-24	4.6	19.0	13.7	4.2	0	28.7
25-29	5.3	13.5	12.7	8.1	3.2	6.6
30-34	4.0	12.2	11.4	6.9	2.2	4.0
35-39	5.1	16.6	12.2	5.8	2.2	3.3
40-44	6.0	14.3	12.3	6.4	1.7	2.2
45-49	3.2	15.0	10.4	5.6	2.7	2.1
2005						
15-19	8.8	24.5	0	0	0	84.5
20-24	4.6	19.3	14.9	4.9	0	31.4
25-29	3.6	15.2	12.9	6.5	3.0	8.7
30-34	4.2	11.8	13.6	6.9	4.2	3.0
35-39	4.9	11.3	10.6	8.2	3.3	2.6
40-44	3.7	17.2	12.3	6.6	2.7	2.4
45-49	4.7	11.8	15.3	6.1	1.8	2.7

Some studies conducted in many countries have shown that delay in first birth contributes significantly to fertility reduction (CSO 2007). Table 4.5 shows that the percentage of women giving birth at age 18 is much higher than at age 22 and 25 in all the four surveys. This shows that more women are giving birth at age 18 in all the four surveys. Table 4.5 further shows that as the age of women increase few births take place in all four surveys. For example in 2005 the percentage of women aged 35 to 39 years who gave birth at age 15 and 25 is 4.9 percent and 3.3 percent respectively.

The median age at first birth was 19 years from 1988 to 2005. This shows that the age at first birth has not changed since 1988. Table 4.5 further shows that in all the four surveys analyzed there are more women who are childless in the age group 15 to 19 years and 20 to 24 years. For example in 1988 and 2005, the percentage distribution of childless women in the age group 15 to 19 years was 83.7 percent and 84.5 percent respectively.

4.5.3 Age at first Sexual Intercourse

Table 4.6 presents the distribution of women by age at first sexual intercourse from 1988 to 2005.

Table 4.6. Age at first Sexual Intercourse						
Current Age	15	18	20	22	25	% never had sexual intercourse
1988						
15-19	5.9	3.9	0	0	0	67.7
20-24	12.2	12.9	7.5	1.7	0	14.9
25-29	15.5	15.7	5.3	1.5	0.4	2.5
30-34	13.8	16.0	7.5	2.4	0.3	0.3
35-39	13.1	14.4	7.8	3.0	0.9	0.2
40-44	16.4	10.7	8.5	1.6	0	0
45-49	14.5	10.3	7.6	2.8	1.4	0.7
1994						
15-19	5.8	4.2	0	0	0	67.6
20-24	9.0	14.8	6.5	2.3	0	14.6
25-29	11.7	15.3	8.1	3.3	1.9	1.9
30-34	10.3	13.9	9.7	2.3	0.7	0.6
35-39	10.7	12.3	8.3	2.0	0.8	0.2
40-44	8.9	13.1	7.2	3.7	0.7	0.2
45-49	11.1	10.8	5.5	4.1	0.2	0
1999						
15-19	5.5	4.4	0	0	0	65.3
20-24	5.8	16.6	7.5	2.2	0	13.8
25-29	7.0	13.9	10.9	3.5	1.8	2.0
30-34	7.6	13.1	9.9	3.4	0.9	0.9
35-39	11.3	12.8	7.3	2.5	0.4	0.3
40-44	10.2	13.2	7.1	2.2	1.0	0.2
45-49	10.2	12.1	9.7	1.3	1.6	0
2005						
15-19	5.4	4.4	0	0	0	69.4
20-24	7.6	14.8	7.5	2.8	0	16.7
25-29	8.7	13.0	9.4	5.0	1.7	3.3
30-34	10.5	12.1	8.5	3.6	2.5	0.7
35-39	8.4	13.8	8.8	3.6	2.3	0.7
40-44	10.1	15.6	7.4	3.1	1.1	0.1
45-49	11.8	11.3	9.0	3.1	0.6	0.2

The age at first intercourse is an important determinant of fertility since it presents the starting point of sexual activities (CSO 2007). Table 4.6 shows that more women were having sexual intercourse at ages 15 and 18 than at ages 22 and 25. This shows that in all the four surveys women were starting to have sexual intercourse at an early age. Table 4.7 shows that the percentage of women who started to engage in sexual activities at age 15 decreased in 1988, 1994 and 1999 and increased in 2005. For example for age group 20 to 24 the percentage decreased from 12.2 percent in 1988 to 9.0 percent in 1994 to 5.8 percent in 1999 and increased to 7.6 percent in 2005.

Table 4.6 shows that the percentage of women who never had intercourse decreased from 1988 to 1999 and then increased in 2005. For example, for age group 15 to 19 years the percentage of women reporting never having sexual intercourse decreased from 67.7 percent in 1988 to 67.6 percent in 1994 to 65.3 percent in 1999 and then increased to 69.4 percent in 2005. This shows that in 2005 there were more women in the age group 15 to 19 years reporting that they were delaying engaging in sexual activities. The median age at first sexual intercourse was 16 years in 1988 and increased to 17 years in 1994, 1999 and 2005. This suggests that in 1994, 1999 and 2005 more women were delaying to have sexual intercourse compared to 1988.

Table 4.7 presents the percentage distribution of 0 to 4 births of currently married and never married women from 1988 to 2005.

Table 4.7. Percentage distribution of marital status by children ever born from 1988 to 2005					
	Number of children ever born (0 to 4 births)				
	0	1	2	3	4
1988					
Never Married	88.2	9.1	1.9	0.2	0.3
Married	6.3	14.2	14.2	13.5	12.9
1994					
Never Married	84.7	11.5	2.3	0.8	0.2
Married	7.7	16.9	16.8	12.7	10.9
1999					
Never Married	82.8	12.9	2.8	0.8	0.6
Married	7.3	20.7	19.3	14.3	10.8
2005					
Never Married	88.2	8.9	1.8	0.6	0.3
Married	7.5	20.7	22.7	16.7	11.1

Table 4.7 shows that women are more likely to have children in marital than non-marital relationship. The percentage distribution of never married women without children is high in all the four ZDHS: 88.2 percent in 1988, 84.7 percent in 1994, 82.8 years in 1999 and 88.2 years in 2005. The percentage of never married women without children decreased from 1988 to 1999 and then increased in 2005. This shows that the majority of never married women do not have children. Table 4.7 shows that more births are occurring to married women than never married women in all the four surveys analyzed. In addition this further shows that more women still value marriage as the stage at which a birth should takes place. For example in 1988 the percentage married and never married with three children was 13.5 percent and 0.2 percent respectively while in 2005 it was 16.7 percent and 0.6 percent respectively.

Table 4.7 also shows that the number of births to married women has been increasing over the years. For example the percentage of births to married women reporting two children increased from 14.2 percent in 1988 to 33.6 percent in 1994 to 38.6 percent in 1999 and 45.4 percent in 2005. Table 4.7 further shows that as the number of births per woman increase the percentage distribution of both married and never married women decreases. For example in 1994 the percentage of women both married and never married with one child was 16.5 percent and 11.5 percent respectively. During the same years the percentage of both married and never married women with four children was 10.9 percent and 0.2 percent respectively. This suggests that more women are having few children in all the four surveys analyzed. Table 4.7 shows that the percentage of women who gave birth increased over the years. For example the percentage of married women who had two children was 14.2 percent in 1988, 16.8 percent in 1994, 19.3 percent in 1999 and 22.7 percent in 2005. Table 4.7 further shows that in Zimbabwe some births are occurring outside marriage although the percentage is low compared to births occurring within marriage.

4.6. Contraception

Contraception is another proximate determinant that has a direct impact on fertility. This section of the paper will explore knowledge and use of contraception in Zimbabwe from 1988 to 2005.

Table 4.8 and 4.9 presents the percentage distribution of women by knowledge and use of contraception.

Method	1988	1994	1999	2005
Knows no method	3.7	2.5	3.2	2.5
Knowledge of traditional methods	0.9	0.2	0.1	0.1
Knowledge of modern methods	95.4	97.2	96.6	97.3

Table 4.8 shows that knowledge of modern methods increased from 1988 to 2005. Knowledge of modern methods was almost universal in Zimbabwe. The percentage of women with no knowledge of any method and those with knowledge of traditional methods has been decreasing over the years. Overall, few women have knowledge of traditional methods of contraception.

Table 4.9. Current use of contraception by method type

Method	1988	1994	1999	2005
No Method	67.8	65.7	63.3	60.2
Traditional methods	5.0	2.6	1.7	0.9
Modern methods	27.2	30.4	34.5	38.6

Table 4.9 above shows that current use of traditional methods has declined over the years. The percentage using traditional methods declined from 5 percent in 1988 to 0.9 percent in 2005. The decrease in the use traditional methods of contraception may be associated with the family planning campaigns introduced and promoted by the government in the 1980s (Boohene and Dow 1987; Thomas and Muvandi 1994). Table 4.9 shows that from 1988 to 2005 the majority of women were not using modern methods of contraception. In 1988 and 2005 about 67.8 percent and 60.2 percent of the women were not using any method respectively. Although the percentage of women not using any method has declined over the years the percentage distribution is still high. Table 4.9 further shows that current use of modern methods has increased over the years. It was 27.2 percent in 1988 and increased to 38.6 percent in 2005. However, although the percentage of women using modern methods has increased over the years, the percentage is still low. Table 4.8 and 4.9, confirms that knowledge and use of contraception are not positively correlated. Although knowledge of modern contraception is universal, the percentage using modern

contraception is low in Zimbabwe. However knowledge does not necessary translate into use of a modern method of contraception.

After running some frequencies it became clear that the modern method of contraception commonly used by most women is the pill. The use of the pill increased from 23.5 percent in 1988 to 26.2 percent in 2005. The percentage of women using the injection has been increasing over the years. In 1988, 0.2 percent of women were using the injection and this rose to 7.4 percent of women in 2005. Interestingly the percentage of women using the condom increased from 1988 to 1994 and decreased from 1999 to 2005. In 1988 the percentage increased from 0.9 percent to 2.5 percent in 1994 and then declined from 2.4 percent in 1999 to 2.0 percent in 2005.

Table 4.10 shows the percentage distribution of contraception use by marital status.

Table 4.10. Percentage distribution of current use of contraceptives by marital status			
	No Method	Traditional Methods	Modern Methods
1988			
Never Married	93.0	1.4	5.6
Married	56.9	7.0	36.1
1994			
Never Married	92.3	0.4	7.2
Married	53.5	4.0	40.7
1999			
Never Married	91.6	0.2	8.1
Married	46.7	2.8	49.9
2005			
Never Married	94.1	0	5.8
Married	39.7	1.6	58.1

Table 4.10 shows that the percentage of married and never married women who are not using any method of contraception is high in all four surveys analyzed. However, married women were more likely than never married women to be using a method. For example

in 1999 the percentage distribution of married and never married women not using any method was 46.7 percent and 91.6 percent respectively. Table 4.10 shows that the use of traditional methods has declined in all the four surveys among married and never married women. The percentage declined from 7.0 percent among married women in 1988 to 4.0 percent in 1994 to 0.2 percent in 1999 and 1.6 percent in 2005. Table 4.10 further shows that more married women are using modern methods of contraception than never married women. The percentage of married women using modern methods increased from 36.1 percent in 1988 to 40.7 percent in 1994 to 49.9 percent in 1999 and 58.1 percent in 2005. The percentage of never married women using modern methods increased from 5.6 percent in 1988 to 7.2 percent in 1994 to 8.1 percent in 1999 and then decreased to 5.8 percent in 2005.

4.7. Postpartum Infecundibility

Studies conducted in different countries have observed that there is a positive correlation between the length and intensity of breastfeeding and period of postpartum amenorrhoea (Bongaarts and Potter 1983; Gutmann and Fliess 1993). Postpartum amenorrhoea refers to the interval between childbirth and the return of menstruation (CSO 2007:94). A woman who is amenorrhoeic or abstaining from sexual activities is not exposed to conception. Postpartum insusceptibility is the period at which a woman is not at risk of conception either because they are amenorrhoeic or abstaining from sexual intercourse (CSO 2007).

Table 4.11 present the median number of months of postpartum amenorrhoea, postpartum abstinence and postpartum insusceptibility from 1988 to 2005.

Table 4.11. Median duration (months) of postpartum variable

Year	Postpartum Amenorrhoea	Postpartum Abstaining	Postpartum insusceptibility
1988	12.6	4.3	13.6
1994	12.9	3.5	14.1
1998	12.4	3.2	15.6
2005	14.3	2.3	15.6

Table 4.11 reveals that in Zimbabwe the period of postpartum amenorrhoea is longer than the period of postpartum abstinence in all four surveys. For example in 1988 postpartum amenorrhoea was 12.6 months while postpartum abstinence was 4.3 months. In 2005 the period for amenorrhoea was 14.3 months and 2.3 months for abstinence. Table 4.11 shows that from 1988 to 2005 the period of amenorrhoea has been increasing. It was 12.6 months in 1988 and increased to 14.3 months in 2005. In addition the period of abstinence has been decreasing over the years. The period of abstinence declined from 4.3 months in 1988 to 2.3 months in 2005. Table 4.11 further shows that the period of insusceptibility or infecundability to pregnancy has increased over the years. The period of insusceptibility increased from 13.6 months in 1988 to 14 months in 1994 to 15.6 months in 1999 and 2005. Table 4.11 suggests that postpartum infecundability has contributed to fertility decline in Zimbabwe.

4.8. Sterility

Sterility is one of the main proximate determinants of fertility in Sub-Saharan Africa. Table 4.12 present the percentage of women aged 40-49 who were childless from 1988 to 2005.

Married Women	1988	1994	1999	2005
40-49	0.54	0.37	0.4	0.4

Table 4.12 shows that the percentage of women aged 40-49 who were sterile was 0.54 percent in 1988, 0.37 percent in 1994, and 0.4 percent in 1999 and 2005. Table 4.12 shows that the percentage of women who were sterile has decreased over the years. Bongaarts et al. (1984) noted that when the percentage of married women who are childless exceeds 3 percent then sterility is a problem in that community. The percentage of women who were sterile was low in Zimbabwe from 1988 to 2005. Table 4.12 suggests that sterility is not a problem in Zimbabwe.

4.9. The role of the four Proximate Determinants on the Fertility decline in Zimbabwe

This section of the paper presents a discussion of the findings obtained using the Bongaarts model and the modifications introduced by Jolly and Gribble (1993). The indices of marriage, contraceptive use, postpartum infecundability and sterility and the estimated and actual TFR are presented in Table 4.13. In examining the results obtained it should be noted that the fertility inhibiting effect is high when the value is close to 0 and is low when the value is close to 1.

Table 4.13 reveals the fertility inhibiting effects of the four proximate determinants of fertility in Zimbabwe.

Table 4.13. The effects of proximate determinants on fertility

Year	Fertility-inhibiting effect of:						Estimated TFR	Actual TRF
	Indices of marriage		Contraception		Postpartum infecundability	Sterility		
	M_0	C_m^1	C_m	C_c	C_i	I_p		
1988	0.91	0.87	0.79	0.59	0.64	1.04	4.5	5.5
1994	1.01	0.69	0.70	0.54	0.64	1.04	3.7	4.3
1999	1.04	0.75	0.78	0.49	0.63	1.04	3.7	4.0
2005	1.08	0.69	0.74	0.42	0.63	1.04	3.0	3.8

Table 4.13 shows that the estimated and actual TFRs have declined over the years. The actual TFR declined from 5.5 births in 1988 to 3.8 births in 2005. The estimated TFR declined from 4.5 births in 1988 to 3.0 births in 2005. It should be noted that in all the four ZDHS analyzed the actual TFR is much higher than the estimated TFR. In explaining the results obtained from this analysis, it should be noted that a greater inhibiting effect is observed when the value is low and a smaller inhibiting effect is observed when the value is high. Table 4.13 reveals the effects of births outside marriage. The model states that M_0 is equal to 1 when all birth occurs within marriage. In 1988 the effect of M_0 was 0.91 as shown in Table 4.13. This shows that in 1988 most births occurred within marriage and marriage patterns contributed significantly to the value of the TFR. The impact of M_0 was 1.01 in 1994, 1.04 in 1999 and 1.08 in 2005. The TFR increased by 0.01 births in 1994, 0.04 births in 1999 and 0.08 births in 2005 due to births that occurred outside marriage. The results obtained give the impression that there is an increase in premarital births in Zimbabwe.

Table 4.13 shows that C_m dropped from 0.79 in 1988 to 0.70 in 1994 and increased to 0.78 in 1999 and further declined to 0.74 in 2005. Table 4.13 also shows that C_m^1 was 0.87 in 1988 and it declined to 0.69 in 2005. The values of C_m (0.70, 0.78 and 0.74) was higher than the value of C_m^1 (0.69, 0.75 and 0.69) in 1994, 1999 and 2005 respectively. In 1988 the value of C_m was less than the value of C_m^1 . These results suggest that marriage has an impact on fertility in Zimbabwe. In addition the results reveal that considering the effect of births outside marriage is important in order to avoid the possibilities of underestimating the marriage patterns on fertility.

Table 4.13 shows that the index of contraception C_c contributed significantly to fertility levels in Zimbabwe in all the four ZDHS analyzed. The index has the lowest fertility inhibiting effect in all the four surveys analyzed. C_c dropped from 0.59 in 1988 to 0.54 in 1994 to 0.49 in 1999 and 0.42 in 2005. Table 4.13 shows that C_c is the most important index in explaining the fertility rate in all the four ZDHS analyzed although other proximate determinants influenced fertility in Zimbabwe. The index of contraception played a crucial role in fertility reduction in Zimbabwe in the mid-1980s ((Mhloyi 1992; Guilkey and Jayne 1997). Table 4.13 shows that in Zimbabwe the inhibitive effect of C_c has been increasing over the years.

A further examination of Table 4.13 shows that postpartum infecundability C_i is an important determinant of fertility in Zimbabwe. The index of C_i dropped from 0.64 in 1988 and 1994 to 0.63 in 1999 and 2005. The index has the second greatest inhibitive effect on fertility in all the four surveys analyzed.

Table 4.13 also reveals the inhibiting effect of I_p in Zimbabwe. Table 4.13 shows that between 1988 and 2005 the index of I_p was 1.04 and it remains unchanged. Since the model states that the values close to 1 has a low inhibiting effect on fertility the value obtained in the analysis of 1.04 suggests that pathological sterility did not contribute to fertility reduction in the years analyzed.

The proximate determinant with the greatest inhibiting effect is contraception followed by postpartum infecundability and then marriage patterns in all the four surveys analyzed. Table 4.13 also shows that there were no variations in proximate determinants in Zimbabwe from 1988 to 2005.

4.10. Relative contribution of Proximate Determinants

Table 4.14 examines the effect of each proximate determinant on fertility from 1988 to 2005. Table 4.14 shows the degree of importance of each proximate determinant from 1988 to 2005. It shows the percentage contribution of each proximate determinant to

fertility in each year. In addition the table shows the number of births reduced by each variable. The inhibiting effect of each variable is obtained from the differences between total fecundity and expected total fertility rate (Wang et al 1987). To obtain the inhibiting effect of each determinant, the total births are prorated by the proportion of the logarithm of each index to the sum of logarithms of all indexes (Wang et al. 1987:224). The total fecundity rate is 18.4 children in 1988, 17.8 children in 1994, 16.6 children in 1999 and 19.4 children in 2005.

Table 4.14. The effects of proximate determinants on fertility

Year	Total	Marriage		Contraception		Postpartum infecundability	
		births per woman	percentage	births per woman	percentage	births per woman	percentage
1988	100	2.1	13.9	4.8	31.2	3.9	25.5
1994	100	2.9	19.1	5.0	32.9	3.7	23.8
1999	100	2.0	13.2	5.8	38.0	3.8	24.6
2005	100	2.3	14.8	6.5	42.8	3.5	22.8

Table 4.14 shows that marriage reduced fertility by approximately 2.1 births in 1988, 2.9 births in 1994, 2 births in 1999 and 2.3 births in 2005. The index of marriage contributed more to fertility decline in 1994 and 2005 with a percentage of 19.1 percent and 14.8 percent respectively. This shows that marriage patterns have influenced fertility rates in Zimbabwe from 1988 to 2005.

The index of contraception played a significant role in reducing fertility rates in Zimbabwe from 1988 to 2005. Table 4.14 shows that contraception reduced fertility by 4.8 births in 1988, 5.0 births in 1994, 5.8 births in 1999 and 6.5 births in 2005. Table 4.14 showed that contraception reduced fertility by 31.2 percent in 1988, 32.9 percent in 1994, 38 percent in 1999 and 42.8 percent in 2005 respectively. The inhibiting effect of contraception is the greatest amongst all the other proximate determinants from 1988 to

2005. Table 4.14 shows that the impact of contraception on fertility increased over the years.

Table 4.14 further shows that in the absence of postpartum infecundability fertility in Zimbabwe would have increased by 3.9 births in 1988, 3.7 births in 1994, 3.8 births in 1999 and 3.5 births in 2005. The index of postpartum infecundability reduced fertility by 25.5 percent in 1988, 23.8 percent in 1994, 24.6 percent in 1999 and 22.8 percent in 2005. Tables 4.14 confirm that in Zimbabwe postpartum infecundability has the second highest inhibiting effect on fertility after contraception in all the four surveys analyzed.

Table 4.14 shows that in Zimbabwe fertility has been influenced by contraception use, postpartum infecundability and marriage patterns. Table 4.14 shows that contraception use was the leading variable influencing fertility levels in Zimbabwe from 1988 to 2005. The variable postpartum infecundability was the second leading inhibitive factor in Zimbabwe from 1988 to 2005. Marriage patterns are the third leading inhibitive factor in Zimbabwe from 1988 to 2005. Table 4.14 shows that there were no variations in the proximate determinants of fertility from 1988 to 2005.

4.11. Summary

This chapter has presented a comprehensive analysis of the four demographic and health survey in Zimbabwe. The main proximate determinants of fertility (marriage, contraception use, postpartum infecundability and sterility) are analyzed and their impact on fertility is also presented in this chapter. The analysis shows that contraception use has had the greatest inhibitive effect on fertility in Zimbabwe from 1988 to 2005. The index of postpartum infecundability has the second inhibitive effect followed by marriage patterns. In addition the findings showed that fertility rates decreased from 1988 to 2005. Interestingly, the results show that there are no variations on the effect of proximate determinants from 1988 to 2005.

CHAPTER FIVE

CONCLUSION AND RECOMMENDATIONS

5.1. Introduction

This chapter presents the main findings of the study. It starts by briefly discussing the results obtained from the study. Characteristics of the respondents, the main determinants of fertility and their impact on fertility number are discussed in this section of the paper. Furthermore, other factors responsible for fertility reduction are also discussed. The chapter closes with some recommendations based on the discussion and conclusion.

5.2. Discussion

Over the past few decades fertility levels have declined throughout the world. However, studies have shown that Africa still has relatively high fertility rates compared to other regions in the world (Thomas and Muvandi 1994). Botswana, Kenya, Swaziland, South Africa and Zimbabwe are some of the few countries in Africa with a low fertility rate (Rutenbeg and Diamond 1993; Cohen 1993; Africa Population Policy Research Centre 1998).

Bongaarts (1978) estimated total fecundity at 15.3 in any population. The indices analyzed in this study produced a total fecundity of 18.4 children in 1988, 17.8 children in 1994, 16.6 children in 1999 and 19.4 children in 2005. These results illustrates that a married woman, not using any contraception method and not breastfeeding or abstaining has the potential to have 18.4 children in 1988, 17.8 children in 1994, 16.6 in 1999 and 19.4 children in 2005. Three proximate determinants have played a significant part in reducing fertility from total fecundity to TFR in Zimbabwe: the proportion of married women, contraceptive use and postpartum infecundability. Guilkey and Jayne (1997) noted that postpartum infecundability, marriage and contraceptive use are responsible for fertility reduction in Zimbabwe. The estimated TFR declined from 4.5 births in 1988 to

3.7 births in 1994 and 1999 to 3.0 births in 2005. The actual TFR was 5.5 births in 1988, 4.3 births in 1994, 4.0 births in 1999 and 3.8 births in 2005. The results confirm that fertility rates have declined in Zimbabwe from 1988 to 2005. Guilkey and Jayne (1997) noted that the TFR observed in 1988 in Zimbabwe is relatively lower by sub-Saharan African standards where a rate of seven to eight children has been noted. In addition TFR is lower in Botswana (4.9 births) and South Africa (4.3 births) during the same period.

The unexplained differences observed between the actual and estimated fertility rate may be due to factors such as induced abortion and HIV/AIDS which were not analyzed in the study. Since abortion is illegal in Zimbabwe, there is no reliable data available to analyze this factor. Although this is the case some studies in Zimbabwe have confirmed that more women are practicing induced abortion (Tichagwa and Maramba 1998; Ministry of Health and Child Welfare 1995 cited in Lovenson et al. 1996). These studies show that induced abortion is another factor responsible for fertility reduction in Zimbabwe.

The results have confirmed that contraception is the strongest factor responsible for the fertility reduction from 1988 to 2005. Loco and Hertrich (1994) noted that the high rate of contraceptive use in Zimbabwe is responsible for fertility reduction. The results however confirm that the fertility transition in Zimbabwe has been triggered by the use of modern methods of contraception. A well organized and administered family planning programmes introduced by the government led to an increase in the knowledge and use of modern methods of contraception (Boohene and Dow 1987; Thomas and Muvandi 1994). Guilkey and Jayne (1997) observed that factors such as low rates of infant and child mortality, an increase in the levels of education, and a well organized family planning programme contributed significantly to the high rate of contraceptive use in Zimbabwe. In 1988, 95.4 percent of the women had knowledge of modern methods of contraception and this increased to 97.3 percent in 2005. This shows that knowledge of modern methods of contraception is universal in Zimbabwe. The results also show that the use of modern methods of contraception has increased from 27.2 percent in 1988 to 38.6 percent in 2005. Bongaarts et al. (1984) noted that knowledge of contraception is not positively related to use of contraception. This is shown in the results obtained in Zimbabwe were

knowledge of contraception is universal while the use of contraception is low. Guilkey and Jayne (1997) noted that apart from South Africa, Zimbabwe has a highest percentage of people using contraception in sub-Saharan Africa.

The results obtained are not in line with the notion of “natural fertility” observed in traditional societies (Henry 1961). In this society fertility is influenced mainly by marriage patterns and postpartum infecundability (Bongaarts and Potter 1983). As a society develops fertility is intentionally restricted by modern methods of contraception and induced abortions (Henry 1961). The results confirm that in the case of Zimbabwe contraception has been the major factor contributing to the fertility reduction since 1988. The period of “natural fertility” since 1988 was not observed in Zimbabwe. In addition the fertility transition took place as a result of the use of modern methods of contraception.

The results also show that the most commonly used method of contraception was the pill followed by the injection and condom from 1988 to 2005. The results showed that the percentage of women using the pill and injection increased from 1988 to 2005. The percentage of women using condoms increased only slightly from 0.9 percent in 1988 to 2.5 percent in 1994 and then declined to 2.4 percent in 1999 and 2.0 percent in 2005. The results confirm that the percentage of women using condoms decreased in 1999 and 2005. There is need for more studies to show the reasons for condom use reduction in Zimbabwe and its impact during this period.

The second factor responsible for the fertility decline in Zimbabwe from 1988 to 2005 is postpartum infecundability. The median duration of postpartum abstinence decreased from 4.3 months in 1988 to 2.3 months in 2005. This shows that women were abstaining for few months in 2005. The duration of postpartum amenorrhoea has increased over the years. The median duration of postpartum insusceptibility increased over the years from 13.6 months in 1988 to 15.6 months in 2005. The results show that in 1988 and 2005 postpartum infecundability reduced fertility by 3.9 births and 3.5 births respectively. This

shows that the fertility inhibiting effect of postpartum infecundability is declining in Zimbabwe.

Marriage patterns are the third factor responsible for fertility reduction from 1988 to 2005 in Zimbabwe. The results showed that the age at first marriage increased slightly over the years. Some studies suggest that the improvement in the levels of education has influenced women to delay marriage (Guilkey and Jayne 1997). The results also show that the percentage of married women is decreasing in Zimbabwe. Although this is the case, marriage is still very common in Zimbabwe (CSO 2007). The results also confirmed that the number of births occurring outside marriage is increasing over the years.

Saxena-Rozzet Jurdi (1998) conducted a study in Yemen using DHS data from 1992 and 1997. The results showed that postpartum infecundability is the leading cause of fertility reduction followed by marriage patterns, contraceptive use and induced abortion. The results showed that the TFR was 7.7 births in 1992 and decreased to 6.5 births per woman in 1997. A study conducted in Malawi using DHS data from 1992 to 2004 showed that postpartum infecundability is the leading cause of fertility reduction. This is followed by marriage patterns and contraceptive use. The results showed that TFR was 6.7 births in 1992, 6.4 births in 2000 and 6.0 births in 2004 (Palamuleni 2007).

Letamo and Letamo (2002) conducted a study in Botswana, Zimbabwe and Zambia using DHS data conducted in these countries. The results showed that proximate determinants are responsible for fertility reduction in these three countries. In Botswana the results from 1984 to 1996 were analyzed in the study. The results showed that in 1984 postpartum infecundability was the leading cause of fertility reduction followed by contraceptive use and marriage patterns. In 1988 marriage was the leading cause of fertility reduction followed by postpartum infecundability and contraception. In 1996 marriage was again the leading cause of fertility reduction followed by contraception and postpartum infecundability. The results showed that the TFR was 6.5 births in 1984, 5.0 births in 1988 and 4.2 births in 1996. In Zambia the results from 1992 and 1996 showed

that postpartum infecundability was the leading cause of fertility reduction followed by marriage patterns and contraception. The results showed that the TFR was 6.5 in 1992 and 6.1 in 1996.

A study conducted in Kenya using DHS data from 1989 to 2003 showed that the TFR was 6.6 births in 1989, 5.6 births in 1993, 4.7 births in 1998 and 4.9 births in 2003. The results showed that postpartum infecundability was the leading cause of fertility reduction followed by marriage then contraception and sterility (Ayanda and Hinde 2006). A study conducted in Ghana from 1988 to 1998 using DHS data showed that postpartum infecundability is the leading cause of fertility reduction followed by contraceptive use and marriage patterns. The results showed that the total fertility rate was 6.4 births in 1988, 5.5 births in 1993 and 4.6 births in 1998 (Chuks 2002). A study conducted in South Africa in 1998 using DHS data showed that marriage patterns followed by contraceptive use and postpartum infecundability influenced fertility rates in South Africa. Since there is no reliable data available on induced abortion, the impact of this index was not examined. In 1998 total fertility rate was 2.0 births per woman in South Africa (Palamuleni et al. 1998).

The studies conducted in Ghana, Kenya, Yemen, Zambia, Botswana and Malawi showed that postpartum infecundability is an important determinant responsible for fertility reduction in these countries (Chuks 2002; Ayanda and Hinde 2006; Saxena-Rozzet Jurdi 1998; Letamo and Letamo 2002; Palamuleni 2007). In South Africa the results showed that marriage patterns are the leading cause of fertility reduction followed by contraception (Palamuleni et al. 1998). The results confirmed that in countries where postpartum infecundability is the leading determinant, fertility rates are high. For example in 2004 Malawi had a TFR of 6.0 births, Yemen in 1997 had a TFR of 6.5 births and Zambia in 1996 had a TFR of 6.1 births per woman (Palamuleni 2007; Saxena-Rozzet Jurdi 1998; Letamo and Letamo 2002). These results show that postpartum infecundability has less impact on fertility rate than contraception. This also confirms that

contraception has the highest inhibitive effect on fertility than postpartum infecundability.

The results also showed that contraception reduced fertility by more births than postpartum infecundability. For example in Zambia TFR in 1992 and 1996 was 6.5 births and 6.1 births respectively while in Malawi the TFR was 6.7 births in 1992, 6.4 births in 2000, 6.0 births in 2004 respectively (Letamo and Letamo 2002; Palamuleni 2007). In the case of Zimbabwe the TFR was 5.5 births in 1988, 4.3 births in 1994, 4.0 births in 1999 and 3.8 births in 2005 (CSO 2007). These results confirm that contraception use reduces fertility more than postpartum infecundability. This conclusion is obtained from the studies presented above were countries with postpartum infecundability as the leading inhibitive factors reduced fertility by few births while countries with contraception use as the leading inhibitive factor reduced fertility by more births. South Africa and Zimbabwe have the highest rate of contraceptive use in sub-Saharan Africa (Guilkey and Jayne (1997). The results showed that South Africa had a TFR of 2.0 births in 1998. This shows that countries such as South Africa and Zimbabwe with high rates of contraceptive use have low fertility rates while countries such as Malawi, Yemen and Zambia where contraceptive use is low have high fertility rates. This suggests that contraception is an important determinant of fertility.

5.3. Conclusion

This study utilizes the model developed by Jolly and Gribble (1993) in order to obtain accurate estimates of the indices of fertility. The results have shown that from 1988 to 2005 fertility has declined by 1.7 births in Zimbabwe. Contraception is responsible for fertility reduction from 1988 to 2005. The impact of contraception on fertility increases over the years. The index of contraception is followed by postpartum infecundability and marriage patterns during the same period. This shows that there were no variations in proximate determinants of fertility in Zimbabwe from 1988 to 2005. The omission of the index of induced abortion and HIV/AIDS in the study is a major limitation. In the case of induced abortion it is most likely that total fecundity was lowered as a result. This

situation is possible since some studies conducted in the country have shown that induced abortion has increased over the years. However the omission of induced abortion in the analysis may have an impact on the accuracy of the inhibitive effect of proximate determinants on fertility from 1988 to 2005 in Zimbabwe.

The model utilized in this study does not consider the impact of HIV/AIDS on proximate determinants and fertility. According to CSO (2007), approximately 21 percent of the women in Zimbabwe were HIV positive in 2005. The HIV/AIDS prevalence rate is higher among women than men in Zimbabwe. In 2005 the HIV/AIDS prevalence rate was 21 percent and 15 percent amongst woman and man respectively (CSO 2007). Zimbabwe is one of the countries in sub-Saharan Africa with a high HIV/AIDS prevalence rate (WHO 2004; UNAIDS 2006). A study conducted in Manicaland has shown that using the results obtained, in the absence of HIV, the TFR would be 4.33 births instead of 3.96 births per women during the late 1980s to 1990s. In addition the results show that the TFR in Zimbabwe has declined by 24 percent as a result of HIV/AIDS during the same period (Terceira et al. 2003). This suggests that HIV/AIDS is an important determinant of fertility in Zimbabwe.

A study conducted in Zimbabwe showed that HIV/AIDS has influenced people to change their behavior in order to protect themselves from the epidemic. These behaviors have promoted fertility reduction in the country (Gregson et al. 1997). Guy (1999) supports this position, noting that HIV/AIDS influences fertility and proximate determinants in different ways. In the 1980s studies have shown that fertility reduction took place in the context of a high HIV/AIDS prevalence rate (Boerma et al. 2003). There is a need for research to examine further the effect of HIV/AIDS and induced abortion on fertility and proximate determinants in Zimbabwe.

5.4. Recommendations

The results showed that few women are using modern methods of contraception while knowledge of contraception is universal in Zimbabwe. There is need to build on existing

family planning programmes in Zimbabwe so as to increase the use of modern methods of contraception. In addition there is a need for government policies that increases the utilization of modern methods of contraception. The results confirm that the percentage of women using female condoms has decreased from 1999 to 2005. There is need for further promotion of condom use in the country since this method has a dual purpose of reducing fertility rates and protecting against HIV/AIDS. The results also confirmed that contraceptive use reduces fertility by more births than postpartum infecundability. There is need for campaigns in African countries where postpartum infecundability is the leading factor responsible for fertility reduction to promote knowledge and use of modern methods of contraception. In addition there is a need for strategies that promote the use of condoms especially in countries with high HIV/AIDS prevalence rates.

The results also showed that the age at first marriage has increased slightly from 1988 to 2005. There is a need for campaigns that will increase the age at first marriage so that women can delay marriage in Zimbabwe and other African countries. The strategies introduced should aim to improve the status of women. This can be achieved by empowering women by intensifying education opportunities. This situation will reduce early marriage and empower women to make decision on their fertility.

REFERENCES

- Adamchak D. J., and Mbizvo M. T., 1990. "Male Fertility and Contraceptive Attitudes and Behavior: The Role of Men in Family Planning in Zimbabwe, Final Report." New York: The Rockefeller Foundation.
- African Population Policy Research Centre (APPRC)., 1998. Fertility decline in Kenya Levels, Trends and differential. Nairobi: Africa Population Policy Research Centre and Population Council.
- Anrudh K. J., and Bongaarts J., 1981. Breastfeeding: Patterns, Correlates, and Fertility Effects. *Studies in Family Planning*, Vol. 12 (3) pp. 79-99.
- Anyara E. L., and Hinde A., 2006. Fertility transition in Kenya: a regional analysis of the proximate determinants. Southampton, UK, Southampton Statistical Sciences Research Institute, (S3RI Applications and Policy Working Papers, A06/03).
- Arnaldo C., 2002. Ethnicity and Marriage patterns in Mozambique. Paper presented at the 15th International Sociological Association World Congress of Sociology, Brisbane, 7-13 July.
- Asiimwe-Okiror G., Opio A.A., Musinguzi J., Madraa E., Tembo G., and Carael M., 1997. Change in Sexual Behavior and Decline in HIV Infection among young pregnant women in Urban Uganda. *AIDS*, Vol. 11 (14) pp. 1757-1763.
- Barnett B., Stein J., 1998. Women's Voices, Women's Lives: The Impact of Family Planning. A Synthesis of Findings from the Women's Studies Project. Research Triangle Park, NC: Family Health International.
- Bijlmakers L., Basset M., and Sanders D., 1998. Socio-economic Stress, Health and child nutritional status in Zimbabwe at a time of Economic Structural Adjustments: A three year logistical study No.105. Motala: Nordiska Afrikainstitutet.
- Blanc A.K., and Rutenberg N., 1990. "Assessment of the quality of data on age at first sexual intercourse, age at first marriage and age at first birth in the Demographic and Health Surveys" in Institute of Resource Development/Macro Systems Inc. An Assessment of DHS-1 Data Quality, pp. 41-79.
- Bledsoe C.H., and Cohen B., 1993. Social Dynamics of Adolescent Fertility in sub-Saharan Africa . Working Group on the Social Dynamics of Adolescent Fertility in sub-Saharan Africa, Committee on Population, National Research Council. Washington, D.C.: National Academy Press.
- Bledsoe C., 1990. Transformation in Sub Saharan Africa Marriage and Fertility, ANNALS, AAPSS: 510.

- Bloom E., and Reedy H., 1987. Age Patterns of women at marriage, Cohabitation and Age at first birth in India, *Demography*, Vol. 23 (4) pp. 509-523.
- Boohene E., and Dow T., 1987. Contraceptive Prevalence and Family Planning Program Effort in Zimbabwe. *International Family Planning Perspectives*, Vol. 13 (1) pp. 1-7.
- Boerma., Gregson T.J, Nyamukapa S., Urassa C.M., 2003. Understanding the Uneven Spread of HIV Within Africa: Comparative Study of Biologic, Behavioral, and Contextual Factors in Rural Populations in Tanzania and Zimbabwe. *Sexually Transmitted Diseases*, 30(10) pp.779-787.
- Bongaarts J., 1987. A Framework for analyzing the Proximate Determinants of Fertility. *Population and Development Review*, Vol. 4 (1) pp. 105-132.
- Bongaarts J., 1982. The Fertility-Inhibiting Effects of the intermediate Fertility variables. *Studies in Family Planning* Vol. 13 (6) pp. 179-189.
- Bongaarts J., Frank O., and Lesthaeghe R., 1984. The Proximate Determinants of Fertility in sub-Saharan Africa. *Population and Development Review*, Vol. 10 (3) pp. 511-537.
- Bongaarts J., and Potter G., 1983. *Fertility, Biology and Behavior: An Analysis of the Proximate Determinants*, New York: Academic Press.
- Caldwell J.C., and Caldwell P., 2001. Regional path of Fertility Transition. *Journal of Population Research*, Vol. 18 (2) pp. 91-117.
- Caldwell J., and Caldwell P., 1983. The Demographic evidence for the incidence and cause of abnormally low fertility in Tropical Africa, *World Health Statistics Quarterly*, Vol. 36 (1) pp. 2-34.
- Caldwell J. C., Orubuloye I. O., and Caldwell P., 1992. "Fertility Decline in Africa: A New Type of Transition". *Population and Development Review*, Vol. 18 pp. 211-242.
- Central Statistics Office., and Macro International Inc., 1989. Zimbabwe Demographic and Health Surveys 1988. Harare: Central Statistics Office.
- Central Statistics Office., and Macro International Inc., 1995. Zimbabwe Demographic and Health Surveys 1994. Calverton, Maryland: Central Statistics Office and Macro International.
- Central Statistics Office., and Macro International Inc., 2000. Zimbabwe Demographic and Health Surveys 1999. Maryland USA: Measure DHS+ Macro International Inc.

- Central Statistics Office., 2004. Botswana Demography and Tourism Statistics. <http://www.cso.gov.bw/cso/index.html>.accessed 01 March 2007
- Central Statistics Office., 2005. Tanzania Demographic and Health Survey 2004.Central Statistics Office.
- Central Statistics Office., 2001. Eritrea Demographic and Health Survey 2000.Central Statistics Office.
- Central Statistics Office., 1993. Botswana Demographic and Health Survey 1992.Central Statistics Office.
- Chimere-Dan O., 1999. Marriage and the Fertility Transition in South Africa. Paper presented at the Third African Population Conference: The African Population in the 21st Century. Durban.
- Chuks J., 2002. Ghana's Reproductive Revolution: Analysis of the Determinants of Fertility Transition. *African Population Studies*, Vol. 17 (1) pp. 47-49.
- Coale A., 1992. Age of entry into Marriage and the date of the initiation of voluntary birth control, *Demography*, Vol. 29 (3) pp. 333-341.
- Cohen B., 1993. Fertility Levels, Differentials and Trends .in Demographic change in sub-Saharan Africa, in Foote K.A., Hill K.A., and Martins L.G., eds. Washington D.C.: National Academy Press.
- Davis K., and Blake J., 1956. Social Structure and Fertility: An Analytic Framework. *Economic Development and Cultural Change*, Vol.4 (4) pp. 211- 235.
- Demographic and Health Surveys., 2007. Zimbabwe Service Availability Survey 2005/06, Harare: Central Statistics Office.
- Ergocmen B.A., and Eryurt M.L., 2003. Other Proximate Determinants of Fertility. <http://www.hips.hacettepe.edu.tr/tnsa2003/data/English/chapter07.pdf>.accessed 28 March 2007.
- Evert K., 1983. 'Contraception and Fertility in the Netherlands. *Family Planning Perspective*, Vol. 15 (1) pp. 19-25.
- Fortney J.A., and Kiragu K., 1995. Family Health International working papers maternal morbidity in Sub Saharan Africa, Washington D.C.: National Academy Press.
- Food and Agriculture Organization (FAO)., 2008. FAO Global Information and early warning system on Food and Agriculture Worlds food programmes special report. <http://www.fao.org/docrep/010/ai469e/ai469e00.htm>.accessed 29 July 2008.

- Food and Agriculture Organization of the United Nations (FAO)., 2004. FAO-Nutrition country profile Zimbabwe. Rome: Food and Agricultural Organization of the United Nations.
- Frank Odile.,and Bongaarts John., 1992. Behavioral and Biological Determinants of Fertility Transition in sub-Saharan Africa. *Statistics in Medicine*, Vol. 10 (2) pp. 161 - 175.
- Frank O.,and McNicollo., 1987. An interpretation of fertility and Population Policy in Kenya. *Population and Development Review*, Vol. 13 (2) pp. 209-243.
- Gaisie S K., 1995. Socio-economic Determinants of Fertility Decline in Botswana. Paper Presented at the 1991 Population and Housing Census Dissemination Seminar.Gaborone.
- Germain A.,and Kim T., 1998. Expanding access to safe abortion: Strategies for action International Women Health coalition.
- Glynn J.R., Buve A., Carael M., Kahindo M., Macauley I.B., Musonda R.M., Jungmann E., Tembo F.,and Zekeng L., 2000. Decreased fertility among HIV-1 infected women attending antenatal clinics in three African cities. *Journal of Acquired Immune Deficiency Syndromes*, Vol 25 (4) pp 345-352.
- Gould W.T., and Brown M.S., 1996. A Fertility Transition in sub-Saharan Africa? *International Journal of Population Geography*, Vol. 2 (1) pp. 1-22.
- Goldman N., Westoff F., and Paul E., 1987.Variations in Natural Fertility: The effect of Lactation and other Determinants. *Population Studies*, Vol. 4 (1) pp. 127-146.
- Government of Zimbabwe. 1996. Poverty Assessment study survey –Preliminary Report. Harare: Ministry of Public Service, Labour and Social Welfare, Social Development Fund.
- Government of Zimbabwe. 2007. Economic Indicators in Zimbabwe 2002. MLRRD. Harare.
- Gray R.H., Wawer M.J., Serwadda D., Sewankambo N., Li C., Wabwire-Mange F., Paxton L., Kiwanuka N., Kigozi G., Konde-Lule J., Quinn T.C., Gaydos C.A., and McNairn D., 1998. Population based study of fertility in women with HIV infection in Uganda. *Lancet*, Vol. 3 (51) pp 98 - 103.
- Gregson S., Zhuwau T., Anderson R. M., and Chandiwana S.K., 1997. HIV and fertility change in Rural Zimbabwe. *Health Transition Review*, Vol. 7 (2) pp. 89-112.

- Gregson S., Zhuwau T., Anderson R. M., and Chandiwana S.K., 1998. Is there evidence for behavior change in response to AIDS in rural Zimbabwe? *Social Science and Medicine*, Vol. 46 (3) pp. 321-330.
- Guilkey D., and Jayne S., 1997. Fertility Transition in Zimbabwe: Determinants of Contraceptive Use and Method Choice. *Population Studies*, Vol. 5 (1) pp.173-189.
- Guengant Jean-Pierre J., 2002. The Proximate Determinants during the Fertility Transition
<http://www.un.org/esa/population/publications/completingfertility/2RevisedGUENGANTpaper.PDF>.accessed 29 July 2008.
- Guengant Jean-Pierre J., and May J.F., 2001. Impact of the Proximate Determinants on the future course of Fertility in Sub-Saharan Africa.
<http://www.un.org/esa/population/publications/prospectsdecline/guengant.pdf>
 .accessed 28 July 2008.
- Gutmann M. P., Fliess K. H., 1993. "The Determinants of Early Fertility Decline in Texas", *Demography*, Vol. 30 (3) pp. 443-457.
- Guy S., 1999. Family Planning in the era of HIV/AIDS: *American Journal of Public Health*, Vol.89 (5) pp 780.
- Guz B., and Hobcraft.J., 1991 . Breastfeeding and Fertility: A comparative analysis. *Population Studies*, 45(1) pp. 91-108.
- Henry L., 1961. "Some Data on Natural Fertility." *Eugenics Quarterly*, Vol. 8 pp. 81-91.
- Hinde A., and Mturi A. J., 2000 .Recent Trends in Tanzania Fertility.*Population Studies*, Vol. 54 (2) pp 177-191.
- Ickis J., 1987. "Structural issues related to delivery systems." In Organizing for Effective Family Planning Programs. (eds.) in Robert J., Lapham.,and George B. Simmons., Washington, D.C.: National Academy Press.
- Islam N., and Islam M., 1993. Biological and Behavioral Determinants of Fertility in Bangladesh: 1975-1989'.*Asia-Pacific Population Journal*, Vol.8 (1) pp 3-18.
- Jolly C., and Gribble J., 1993. "The Proximate Determinants of Fertility," in Foote K.A., Hill K.H., Martin L.G., (eds.) Demographic Change in sub-Saharan Africa. Washington D.C.: National Academy Press.
- Johnson B., Ndhlovu S., Farr., and Chipato T., 2002. Reducing Unplanned Pregnancy and Abortion in Zimbabwe through Post abortion Contraception. *Studies in Family Planning*, Vol. 2 pp. 195-202.

- Kaufman C.E., 2000. Reproductive Control in Apartheid South Africa *Population Studies*, Vol. 54 (1) pp. 105-114.
- Kamali A., Carpenter L.M., Whitworth J.A.G., Pool R., Ruberantwari A., and Ojwiya A., 2000. Seven-year trends in HIV-1 infection rates and changes in sexual behaviour among adults in rural Uganda. *AIDS*, Vol. 14 (4) pp. 427-434.
- Kigadye R.M., Klokke A., Nicoll A., Nyamuryekunh'e K.M., Borgdorff M., Barongo L., Laukarm-Josten U., Lisekie F., Grosskurth H., and Kigadye F., 1993. "Sentinelsurveillance for HIV-1 among pregnant women in a Developing country: 3 years' experience and comparison with a population survey." *AIDS*, Vol.7 pp.849-855.
- Kirk D., and Pillet B., 1998. "Fertility in Sub-Saharan Africa in the 1980s and 1990s". *Studies in Family Planning*, Vol. 29 (1) pp.1-22.
- Knodel J.E., 1982. Child Mortality and Reproductive Behavior in German Village Populations in the Past: A Micro-level Analysis of the Replacement Effect. *Population Studies*, 36 (2) pp. 177-200.
- Lesthaeghe R., 1989."Production and Reproduction in Sub-Saharan Africa: An Overview of Organizing Principles." in *Reproduction and Social Organization in Sub-Saharan Africa*, edited by R. Lesthaeghe. Berkeley: University of California Press pp.13-59.
- Leroy V., Ladner J., Nyiraziraje M., De Clercq A., Buzubagira A., van de Perre P., Karita E., and Dabis F., 1998. Effect of HIV-1 infection on pregnancy outcome in women in Kigali, Rwanda, 1992 - 1994. *AIDS*, Vol 12 (6) pp. 643-650.
- Letamo G., and Letamo H.N., 2001. "The Role of Proximate Determinants in fertility Transition: A comparative study of Botswana, Zambia and Zimbabwe" *South African Journal of Demography*, Vol. 8(1) pp. 29-35.
- Letamo G., 1996. Contributions of the proximate determinants to fertility change in Botswana. *Journal of Biosocial Science*, Vol. 28 (3) pp. 325-338.
- Lewis J.J., Ronsmans C., Ezeh A., and Gregson S., 2004. The population impact of HIV on fertility in sub-Saharan Africa. *AIDS*, Vol. 18 (2) pp. 35-S43.
- Locoh T., and Hertrich V., 1994. The onset of the Fertility Transition in sub-Saharan Africa. Liege: International Union for scientific study on Population.
- Lovenson R., Edwards L., and Ndlovu-Hove P., 1996. Reproductive Health Rights in Zimbabwe. Training and Research Support Centre: Harare
- Lucas D., 1992. Fertility and Family Planning in Southern and Central Africa. *Studies in Family Planning*, Vol. 23 (2) pp. 145-158.

- Madziba E., 2008. Help Men understand Infertility.in The Herald.www.herald.co.zw.pp.3 accessed 03 January 2008.
- Makatjane T J., and Toebe.1999. Labour Migration and duration of Breastfeeding in Lesotho. *Review of the South African Studies*.Vol.3 (2) pp. 19-36.
- Matchaba-Hove R., 2006. HIV/AIDS in the Zimbabwe Defence Force: A civil society perspective.<http://www.google.co.za/search?hl=en&q=+HIV%2FAIDS+in+Zimbabwe+by+Matchaba-Hove+2006&btnG=Search&meta=> .accessed 30 July 2008.
- Maxwell D., 1998. Can Qualitative and Quantitative Methods serve complementary purposes for Policy Research? Evidence from Accra. Washington D.C: International Food Policy Research Institute.
- Mahy M., and Gupta N., 2002. Trends and Differentials in adolescent reproductive behavior in sub-Saharan Africa.DHS Analytical studies No.3 Calverton, Maryland: ORC Macro.
- MajelantleR. G., and Letamo G., 1999. Reproductive health problems of teenage childbearing in Botswana. National Council on Population and Development. Population Secre-tariat. Ministry of Finance and Development Planning.
- Mbizvo M. T., and Adamchak D. J., 1991."Family planning Knowledge, Attitudes, and Practices of men in Zimbabwe". *Studies in Family Planning*, Vol. 22(1) pp. 31-38.
- Mbamaonyekwu J.C., 2000. Signs of fertility transition in Nigeria. *African Population Studies*. Vol.15 (1) pp.23-42.
- Mhloyi M.M., 1988. "The Determinants of Fertility in Africa Under Modernization." Pp. 2.3.1-2.3.22 in *African Population Conference 1988, Dakar-Senegal*. Liège: Derouaux-Ordina.
- Mhloyi M., 1987. The proximate determinants and their socio-cultural determinants: the case of two rural settings in Zimbabwe. The cultural roots of African regimes: proceedings of the Ife conference, February 25-March 1, 1987. Ife, Nigeria: Obafemi Awolowo University, Department of Demography and Social Statistics.
- Mhloyi M.M., 1992. Fertility Levels and Trends in Zimbabwe.*Zambezia*, Vol. 19 (2) pp.79-97.
- Mhloyi M., 1987. The proximate determinants and their socio-cultural determinants: the case of two rural settings in Zimbabwe. The cultural roots of African regimes: proceedings of the Ife conference, February 25-March 1, 1987. Ife, Nigeria: Obafemi Awolowo University, Department of Demography and Social Statistics.

- Mturi A.J., Moerane W., 2001. Premarital Childbearing among Adolescents in Lesotho. *Journal of Southern African Studies*, Vol. 27 (2) pp. 259-275.
- Mostert P., Hofmeyr E., Oosthuizen. S., and van Zyl A., 1998. Demography, Pretoria: Human Science Research Council.
- Mturi A.J., and Hinde R.A, 1994. Fertility Decline in Tanzania. *Journal of Biosocial Science*, Vol. 26 (4) pp. 529-538.
- Mturi A., and Hlabana T., 1999. Fertility in Lesotho: Recent Trends and Proximate Determinants. *The African Population in the 21 century. African Population Studies 2* pp. 145-164.
- Mukiza-Gapere J., and Ntozi J.P.M., 1995. Impact of AIDS on Marriage Patterns, Customs and Practices in Uganda. *Health Transition Review*, Vol. 5 pp. 201-208.
- Muntro L., 2002. Zimbabwe's child Supplementary feeding Programme: A re-assessment using Household Surveys Data. *Disaster*, Vol. 26 (3) pp. 242-261.
- Ndlovu C., 2005. The termination of Pregnant Act. in Speak out .Womens Action Group. Issues number 63.
- Ni- Amoo Dodoo F., 2001.Fertility Preference and Contraceptive Use: A profitable nexus for understanding the prospects for Fertility Decline in Africa. <http://www.un.org/esa/population/publications/prospectsdecline/dodoo.pdf>.accessed 28 July 2008.
- Ntozi J., 2002 'The Impact of HIV/AIDS on Fertility in Sub-Saharan Africa." *African Population Studies*, Vol.17 (1) pp. 103-124.
- Orubuloye I.O., Caldwell P., and Caldwell J.C., 1992. African women's control over their sexuality in an era of AIDS. Health Transition working paper, Health Transition Center, Canberra: Australian National University.
- Palamuleni E., 2007. Determinants of Fertility Decline in Malawi: An analysis of the Proximate Determinants. <http://uaps2007.princeton.edu/download.aspx?submissionId=70052>.accessed 28 July 2008.
- Palamuleni M., Kalule-Sabiti I., Makiwane M., 1998. Fertility and Childbearing in South Africa <http://www.hsrb.ac.za/Document-2277.phtml>.accessed 28 July 2008.
- Potts D., and Marks S., 2001. Fertility in Southern Africa: The Quiet Revolution.*Journal of Southern African Studies*, Vol. 27 (2) pp. 189-205.

- Pritchett H., 1994. Desired Fertility and the impact of population policies. *Population and Development Review*, Vol.20 (1) pp. 1-55
- Ridduff R., and Parnell M., 1989. The varying connection between Marital Status and Childbearing in the United States. *Population and Redevelopment Review*, Vol. 13 (3) pp. 447-470.
- Ross J., Stove J., and Willards A., 1999. Profile for Family Planning and Reproductive Health Programs 116 countries. Washington D.C.: Future Group International.
- Rutenberg N.,and Diamond I., 1993. "Fertility in Botswana: The Recent Decline and Future Prospects." *Demography*, Vol. 30 (2) pp. 143-157.
- Ryder R.W., Batter V.L., Nsuami M., Badi N., Mundele L., Mutela B., Utshudi M.,and Heyward W.L., 1991. Fertility rates in 238 HIV-1 seropositive women in Zaire followed for 3 years postpartum. *AIDS*, Vol. 5 pp 1521-1527.
- Sanchez S., 1998. The relationship between Nuptiality and Fertility: A case on the Spanish Province of Navarre 1986-1991. *Population Studies*, Vol. 52 (1) pp. 103-115.
- Saxena-Rozzet J., 1998. Impact of Proximate Determinants on the Recent Fertility Transition in Yemen. www.escwa.un.org/popin/publications/new/prem.doc .accessed 28 July 2008.
- Sewankombo N.K., Wawer M.J., Gray R.H., Serwadda D., Li C., Stalling R.Y., Musgrave S.D., and Konde-Lule., 1994. Demographic impact of HIV infection in rural Rakai District, Uganda:results of a population-based cohort study, *AIDS* 8 pp.1707-1713.
- Sibanda A., Woubalem Z., Hogan D., Lindstrom P., David P., 2003. The Proximate Determinants of the Decline to Below-replacement Fertility in Addis Ababa, Ethiopia. *Studies in Family Planning*, Vol. 34 (1) pp 17- 29.
- Sibanda A., 1997. Fertility Transition in sub-Saharan Africa: Establishing the sources and Determinants of reproductive change in Zimbabwe and Kenya.PHD dissertation. University of Pennsylvania.
- Swartz. L., 1996. Fertility Transition in South Africa and its implications on the four Major Population groups. <http://www.un.org/esa/population/publications/completingfertility/RevisedSwartzpaper.PDF>.accessed 20 February 2008.
- South Africa Population Report., 2000. The State of South Africa Population report: Population, Poverty and Vulnerability, Pretoria: The National Population Unit.

- Tabutin D., and Schoumaker B., 2001. -Une analyse regionale des transitions de fcondit en Afrique sub-saharienne-, paper presented at the IUSSP XXIVth International Population Conference, Salvador de Bahia, Brazil.
- Terceira N., Gregson S., Zaba B., and Mason P., 2003. The contribution of HIV to fertility decline in rural Zimbabwe, 1985-2000. *Population Studies*, Vol. 57(2) pp. 149-164.
- Tichagwa W., and Maramba P., 1998. Beyond Inequalities Women in Zimbabwe. Women Resource Centre and Network: Harare.
- Thomas D., and Muvandi I., 1994. The Demographic Transition in Southern Africa: Another Look at the Evidence from Botswana and Zimbabwe, *Demography*, Vol. 31(2) pp. 185-207.
- Tuoane M., 1995. Socio-economic Status of Women and Fertility in Lesotho. Working paper in Demography. No 22, National University of Lesotho: Demography Unit Department of Statistics.
- Udjo E. O., 2001. Marital Patterns and Fertility in South Africa: The Evidence from the 1996 Population Census. Poster [P43.1] Displayed at the XXIVth IUSSP General Population Conference, Salvador, Brazil.
- United Nations., 2001. World Population Prospects. The 2000 Revision, Volume I, Comprehensive Tables. New York: UN
- UnitedNations.,2000.
www.un.org/esa/population/publications/abortions/doc/mozamb.accessed04February2003.
- United Nations., 2004. Report on the Global HIV/AIDS Epidemic. New York:UN.
- UNAIDS., 2005. Africa: Fact Sheet.<http://hdr.undp.org/statistics/data>.accessed 20 June 2007.
- UNAIDS 2006., and WHO ., 2004., AIDS Epidemic update: December 2000.UNAIDS and WHO, Geneva.
- UNAIDS., 2005. Evidence of HIV Decline in Zimbabwe: A comprehensive review of the Epidemiological data, (UNAIDS/05.26E),http://data.unaids.org/publications/irc-pub06/Zimbabwe_Epi_report_Nov05en.pdf.accessed 12 December 2005.
- UNAIDS., 2001., Report on the Global HIV/AIDS Epidemic. UNAIDS, Geneva.

- van de Walle F., Omideyi., 1988. The Cultural Roots of African fertility Regime, Dakar: African Population Conference.
- van de Walle E., and van de Walle F., 1988. "Birth spacing and Abstinence in Sub-Saharan Africa." *International Family Planning Perspectives*, Vol. 14(1) pp. 25-26.
- van de Walle E., and Foster A., 1990. Fertility Decline in Africa: Assessment and Prospects, World Bank, Washington D.C.
- Vimard P., Fassassi R., Talnan R., 2001, -Le dbut de la transition de la fcondit en Afrique sub-saharienne-: un bilan autour des exemples du Kenya, du Ghana et de la Cte dIvoire-, paper presented at the IUSSP XXIVth International Population Conference, Salvador de Bahia, Brazil, 20-22 August 2001.
- Way A. A., Cross A. R., and Kumar S., 1987. Family planning in Botswana, Kenya, and Zimbabwe. *International Family Planning Perspectives*, Vol. 13 pp. 7-11.
- Wang S., Chen Y., Chen C., Rochat R., Chow L., and Rider P., 1987 .'Proximate Determinants of Fertility and Policy implications in Beijing'. *Studies in Family Planning*, Vol. 18(4) pp 222-228.
- Warren C., Johnson J., Gule G., Hlope E., and Kraushaar D., 1992 .The Determinants of Fertility in Swaziland. *Population Studies*, Vol. 46 (1) pp5-17.
- Weeks J., 1999. Population: An Introduction to Concepts and Issues seventh edition, Toronto: Wadsworth.
- World Bank., 2000. Burundi Summary Gender Profile.
<http://www.worldbank.org/afr/gender/Burundi.pdf>, accessed 04 February 2003.
- World Bank., 2006. World Development Report. New York: Oxford University Press.
- World Health Organization, Maternal and New Born Health et al., 1998. Unsafe Abortion. Global and regional estimates of incidence and mortality due to Unsafe Abortion with a listing of available country data, Geneva, WHO, 109 p.
- Zaba B., and Gregson S., 1998.Measuring the impact of HIV on the fertility in Africa, *AIDS* 12 pp. 41-50.