LEVELS, TRENDS AND DIFFERENTIALS IN PRIMARY INFERTILITY IN KENYA
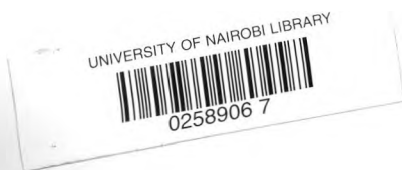
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DECLARATION

This project is my original work and has not been presented before for the award of a degree in any other university.

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DEDICATION

I proudly dedicate this work to my loving mother Selina for laying a foundation in my education.

ACKNOWLEDGEMENT

ABSTRACT

The study focused on the levels, trends and differentials of primary infertility in Kenya. Its three objectives were: to re-examine the levels of primary infertility in Kenya, to determine the trends of primary infertility and to establish differentials of primary infertility rate in Kenya.

The study utilized proxy data drawn from the Kenya 1989 and 1999 population censuses data on children ever born and was restricted to ever married women in order to ensure valid sample for the estimation of primary infertility. This is because in sub-Saharan Africa people place a high premium on children such that it is possible some cases of divorce or remarriage could be associated or due to infertility. Also, emphasis was given to ever married women towards the end of their fecund period (40-49) in order to ensure adequate exposure to childbearing.

The findings suggest that the levels of primary infertility in Kenya are moderate compared to other countries. From the 1989 census data, the magnitude of primary infertility in Kenya among ever-married women aged 40-49 was 2.63 percent. The 1989-99 decade experienced a slight increase and recorded 2.81 percent. The analysis further revealed that the magnitude of primary infertility in Kenya is higher when ever-married women aged 50+ are factored in the estimation of primary infertility. The findings show that primary infertility is evident in urban areas compared to rural Kenya and also in Coast, Nairobi and Nyanza provinces compared to other regions of Kenya. Central

province has the lowest rates over time. There was no clear relationship between education and primary infertility in Kenya.

Primary infertility has reproductive health and social implications and hence the study recommends improving access to quality infertility services at all levels and strengthening programs that are centered to meet the needs of specific regions with higher infertility rates rather than national only. Also, the study recommends enhancing training in the management and prevention of infertility at all the levels of health care.

Regarding further research, the study recommends that qualitative approaches and more variables should be employed in order to gather better insights on infertility and to develop a better understanding of the contribution of infertility to fertility. A study on the factors determining the higher prevalence rate of primary infertility in urban areas and regions like Coast, Nairobi and Nyanza provinces should be encouraged. Research on secondary infertility should be carried out since secondary infertility may exist in a much larger extend.

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CHAPTER ONE: INTRODUCTION

1.1 Background information

Population sizes do increase mainly because of fertility. Thus, infertility or involuntary infecundity is one of the proximate determinants of fertility (Bongaarts, 1978; Casterline et al, 1984). According to Family Health International (FHI, 2003) infertility affects both men and women and is caused by either of the couples. However, previous researches have demonstrated that the consequences of childlessness are far more severe for women than they are for men even when the woman is not the solid cause of the infertility problem in sub-Saharan Africa (International Institute for Population Sciences, 2008; Larsen et al, 2003).

Involuntary childlessness is common among couples of developing countries while voluntary childlessness in developed countries. From the mid-seventies, demographers and policy makers started paying attention to childlessness. This is especially in developed countries like the United States of America (USA), United Kingdom (UK), Canada, Brazil, etc. since these countries are experiencing zero population growth rate (Veevers, 1972; Pathak & Pandey, 1994). On the contrary, the subject of infertility has received casual attention in developing countries due to the preoccupation of these countries with the problems of rapid population growth. But, after the 1994 UN International Conference on Population and Development (ICPD), there was a shift in emphasis on reproductive health and the need for more knowledge about the levels and differentials of infertility.

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The main causes of infertility in Africa such as malnutrition, sexually transmitted diseases (STDs) and infections subsequent from childbirth and abortion are preventable yet there is still a significant composition of couples suffering from either primary or secondary infertility. As a result, prevention and treatment of infertility is now frequently listed as a reproductive health indicator of population programmes monitoring and evaluation (UNFPA, 1997, 1999; WHO, 1997, 2001; Larsen et al, 2003).

Management and treatment of infertility in sub-Saharan Africa is viewed to be a futile exercise due to inadequate health care facilities, highest poverty levels experienced in the region and the relatively high cost of treating infertility coupled with the notion that in most African societies, infertility is viewed to be a shameful condition hence not freely expressed in discussions of reproductive health implying that more efforts should focus on preventing infertility (Larsen, 1995; Bentley et al, 2000; FHI, 2003; Sekadde-Kigondu, Chikamata, Franken & Mati, 2005; United Nations Population Fund, 1993).

However, to evaluate the effectiveness of the preventive measures and treatment of infertility being undertaken, more knowledge need to be addressed about the prevalence and trends in infertility (Larsen, 1995; Larsen et al, 2003) as well as its linkages to the success of family planning programs especially in Kenya where fertility has stalled (KDHS, 2003). Previous studies have estimated primary infertility in Kenya at 2-3 percent (Odile, 1983, 1983b; Chepng'eno, Obare & Ezeh, 2005). Therefore, there is need to re-examine levels of primary infertility in Kenya over the years.

1.2 Problem statement

Primary infertility or involuntary infecundity remains a problem requiring attention because of the stigma and cultural trauma infertility victims are subjected to, both at the individual and societal levels. This group is so much in need of attention that when new methods for treatment and management of infecundity such as In-Vitro Fertilization (IVF) or (test tube babies) were introduced many rushed for them.

Most studies on infertility have focused mainly on its causes (WHO, 1987; Larsen et al, 2003; Mati et al, 1973) and ignored the levels (prevalence), and hence trends of primary infertility at the population level. For instance, between 1978 and 1985, the World Health Organization (WHO) conducted a study on diagnosis and treatment of infertility and the results showed that women who had at least reported a history of sexually transmitted infections (STIs) had higher rates of infertility than women who did not (Larsen, 1995; Menken et al, 1986; Mati et al, 1972). A study found out that the main preventable causes of infertility are STIs and precisely chlamydial infection and gonorrhoea (FHI, 2003; Caldwell & Caldwell, 2000).

While primary infertility remains an issue, establishing the levels, trends and differentials will shade the much needed light for information, education, policy and practice.

1.3 Key research questions

This study intended to answer the following key research questions:

1. What are the levels of primary infertility in Kenya using the parity progression ratio (PPR) method?

2. What are the trends of primary infertility in Kenya?

3. What are the differentials of primary infertility in Kenya?

1.4 Research objectives

The main objective of this study was to determine the levels, trends and differentials in primary infertility in Kenya.

The specific objectives were:

1. To re-examine the levels of primary infertility in Kenya using a different method.

2. To determine the trends of primary infertility in Kenya.

3. To find out the differentials of primary infertility in Kenya by region, education and place of residence.

1.5 Justification of the study

Infertility which is an aspect of the Reproductive Health and a proximate determinant of fertility has been ignored by researchers probably because of its obscurity as a result of the much higher fertility rates experienced in sub-Saharan Africa. Despite the fact that the proportion affected by infertility in Kenya is low (2.2 percent and 2.4 percent in 2003 and 1998 KDHS respectively), infertility is a human rights issue (ICPD, 1994) given the traumatic consequences experienced by the affected individuals. Unfortunately, studies on infertility have taken a medical dimension with the focus on its causes.

The study of infertility is significant given the fact that in many developing countries including Kenya, procreation is highly valued such that infertile couples have had devastating consequences at an individual as well as societal level (Bentley et al, 2000; Larsen et al, 2003; Sekadde-Kigondu et al, 2005; Caselli et al, 2006). For instance, Bhatti et al, (1999) found out that infertile women in Pakistan experienced social discrimination like restriction on participating in social events or celebrations and molestation by in-laws. Divorce as a result of childlessness is experienced in China and SouthWest Uganda (Larsen et al, 2003) and Tanzania (Favot et al, 1997).

Furthermore, Xu et al, (1994) found out that uneducated, rural infertile couples in China experienced psychological problems and / or coercion by in-laws due to infertility much more than their counterparts in urban and educated. According to FHI (2003) and Sekadde-Kigondu et al. (2005), infertile couples cannot inherit property and thus may lack financial support in old age. Also, some couples may be grieved and frustrated while others may even engage in extramarital relations, thus posing a greater risk of STIs and HIV/AIDS to them. At times, the infertile women are forced to allow their husband to remarry so as to carry on the family lineage.

According to FHI (2003), majority of family planning providers have paid more attention to helping clients avoid unintended pregnancies, often at the expense of neglecting involuntary infecundity. Hence the findings of this study will inform policy makers, family planning providers and reproductive health programs in reorientation of their future interventions based on the empirical evidence on the levels, trends and differentials in primary infertility in Kenya which is crucial in improving reproductive health in Kenya as well as preserving fertility.

1.6 Scope and limitation

This study focused on comparative analysis of the levels and trends in primary infertility in Kenya from the 1989 and 1999 population censuses. However, due to time and financial limitations, it was not possible to do a detailed analysis on differentials and hence only a few variables were selected.

Another limitation was that literature was scanty to allow for critical comparisons on this topic, probably because infertility is a phenomenon that should be observed overtime.

Also, better insights in infertility were to be gained if qualitative approaches were used to supplement the quantitative data from the censuses.

CHAPTER TWO: LITERATURE REVIEW

2.1 Introduction

Epidemiological studies and the WHO have defined infertility as the absence of conception after twelve months despite cohabitation and exposure to pregnancy and without contraceptive use (WHO, 1991). For example, Cheng et al, (1992), an epidemiologist conducted a study in Henan province of China whereby the measurements of primary infertility was inability to conceive after twelve months despite active sexual activity and not practising contraception. The results were that about 2 percent of the 11, 810 couples interviewed were infertile. Similarly, Tu et al, (2000) studied the level of primary infertility in China and defined primary infertility on the basis of failure to conceive after at least two years of non-contraception and active sexual intercourse. In order to avoid underestimation, Tu et al regarded primary infertility to include married women with first pregnancy after an interval of at least twenty-one months from the date of their first marriage. Subsequently, the total infertility rate was 1.9 percent.

Evidently, this definition draws sharp reactions particularly from demographers who argue that the time limit given is problematic because it is possible that some of these women would still conceive without any treatment at all and/ or perhaps fail to have a livebirth (Larsen 2003, 2000; Larsen et al, 2003; Collins et al, 1983). Hence, these women would still remain childless because sterility or infecundity (failure to reproduce children) is seen through infertility. Also, using the two-year definition to estimate infertility tends to overestimate primary infertility. It is further argued that throughout Chinese populations the average interval between marriage and the first birth has been

three or four years. Hence, it is incorrect for Tu et al (2000) to lump married women with duration of at least twenty-one months between marriage and the first birth as cases of primary infertility (Larsen et al. 2003; Wolf, 2001; Zhao, 1997).

Furthermore, demographers argue that it's difficult to collect complete data about conceptions in population based surveys hence most demographic analyses of infertility are based on secondary data such as Demographic and Health Surveys (DHS) and population censuses which contain complete birth histories but lack information on miscarriages and stillbirths. Therefore, to circumvent this problem of lack of data, and the fact that demographers are not merely interested in conceptions but also livebirths, demographers define infertility as the inability of a sexually active woman who is not using contraception to have a livebirth (Larsen, 2000; Menken and Larsen 1989, 1991; United Nations Population Fund, 1993).

Regarding the correct time limit in the measurements of infertility, Larsen and Menken recommend the use of 7 years of exposure to measure primary infertility and 5 years of exposure to measure secondary infertility. For instance, Larsen (2004) defines primary infertility as the inability of non-contracepting, sexually active woman within the reproductive age to have a livebirth after seven years of marriage. Therefore, primary infertility is measured by the proportion of childless women who entered their first marriage at least 7 years before date of interview (Larsen, 2000; 2003). Contraception seems not to affect estimates of primary infertility because in most cases, infertile women would not use contraceptives (Larsen, 2000).

Demographic studies that use secondary data to estimate infertility usually measure infertility in two main ways: infertility at the end of the reproductive life i.e. 40-

49 years old (International Institute for Population Sciences, 2008; Pathak & Pandey 1994; Bentley et al, 2000) or the absence of recent live births. The former method is commonly used in the estimation of primary infertility in sub-Saharan Africa because it gives the most precise estimates since it allows ample exposure to childbearing (Sekadde-Kigondu et al, 2005; Bentley et al, 2000; Pathak & Pandey, 1994).

2.2 Estimation of primary infertility

Demographers use parity progression ratio (PPR) to estimate both primary and secondary infertility (Pathak & Pandey, 1994; Henry, 1953). The solid function of the PPR is to estimate fertility and hence the complement of the parity progression ratio is equivalent to the risk of becoming sterile before and after the birth of an additional child.

Estimation of primary infertility by using the PPR model takes the following procedure.

$$PPR_i = \frac{W(i+1)}{W_{i+}}$$

Where W_{i+} is the number of ever married women with parity i and above and PPR_i is the probability that a woman of parity i will ever move to (i+1)-th parity.

Hence, the extend of infertility for the i-th parity is the complement of the PPR. For instance, let K_i be the extent of infertility for the i-th parity, then

$K_i = 1 - PPR_i$ where i = 0 (parity zero).

2.3 Infertility prevalence

Sexually transmitted infections (STIs) are important risk factors for both infertility and HIV/AIDS in Kenya and the entire sub-Saharan Africa (Mati, J.K. 1972;

Caldwell & Caldwell, 2000; Caldwell & Caldwell, 1992; Mayaud, 2001; Fleming & Wasserheit, 1999; Favot et al, 1997). This is evident from studies conducted by the WHO task force in the 1970s and 1980s on infertility, which revealed that STIs were the major causes of infertility in sub-Saharan Africa (Larsen, 1995; Larsen, 2000; Menken et al, 1986; Mati et al, 1973; Mati et al. 1972). Between 1973 and early 1990s, Tanzania had a comparatively higher primary infertility of about 10% than Kenya and Uganda. But it later dropped to about 2.5 percent (Larsen, 2003) and the explanation for the higher rates of primary infertility in Tanzania is the higher prevalence of STIs (Larsen, 2000; 2003).

Furthermore, Larsen (2003) and Favot et al (1997) found out that infertile women compared to fertile ones were more likely to be exposed to STIs because of their tendency to have more sexual partners. Evidently, this finding suggests that the same impetus employed in the management of STIs in order to reduce the prevalence and new incidences of HIV/AIDS, should be directed towards the eradication of infertility in Kenya.

Studies on infertility based on data from the World Fertility Survey (WFS) in the 1970s involving a number of developing countries including Kenya showed that infertility among married women aged 40-49 who were sexually active and non-contracepting for at least five years varied from 1.3 to 6.7 percent (Bentley et al, 2000; Larsen, 2000). However, Sherris and Fox (1983) argued that the WFS had not surveyed most of the sub-Saharan African countries with the highest levels of infertility.

According to Odile (1983), infertility is evident in the population of Nairobi and Coast provinces. Larsen (2003), on estimating the regional levels and trends in primary and secondary infertility in Tanzania, found out that primary infertility was not associated

with place of residence, age at first sex and marital status. However, other studies have shown that marital status is an important predictor of primary infertility. This is evident from various studies, which indicate that infertile women had more marital breakdowns as well as more lifetime sexual partners (Caselli, 2006; Larsen, 2003, 1997; Larsen et al, 2003; Bhatti et al, 1999; Favot et al, 1997). For instance, Larsen et al (2003) on studying the prevalence of primary infertility in China found out that divorced and remarried women experienced significantly higher odds of primary infertility compared to first-married women in Qinghai and Xinjiang. Also, this study asserted statistically that women who had had two or more partners were four times more likely to experience primary infertility than those who did not. Generally, the study found out that the total infertility rate for China was relatively low (1.3 percent).

Infertility seems to be more prevalent in urban compared to rural areas in sub-Saharan Africa. Larsen (2003) demonstrated that urban residents had significantly higher odds of secondary infertility than rural residents, depicting that preventive measures should be focused more on urban residents. Larsen and Raggers (2001), postulate that infertile women tend to migrate from rural to urban areas probably because in traditional societies as in rural areas compared to modern (urban), the pressure to have children is more (Caldwell, 1980). They further suggest that due to common sexual networking experienced in urban areas especially along the major highways as evidenced in Dar es Salaam City and the coast regions, probably there is increased risks of contracting STIs and consequently, infertility (Larsen, 2003).

There are findings that suggest that there is an association between age at first intercourse and infertility. For instance, Larsen (1995) on studying the trends of infertility

in Nigeria reported that the proportion infertile is 15 percent at ages 20-24 for women who had had intercourse before age 13 but only 4 percent for their controls who postponed sexual activity until after 19 years of age.

Moreover, Menken and Larsen (1989) found that the risk of childlessness increases with age because the older a woman is, the longer she has been exposed to risks of pelvic inflammatory disease (PID). For instance, it is 6 percent for women aged 20 to 24 years old, 9 percent for those aged 25 to 29, and 15 percent for women aged 30 to 34 and then rises much more sharply to 30 percent for women aged 35 to 39 and 64 percent for women aged 40 to 44 years. However, they also caution that women or couples who avoid these health problems or treat them adequately, face only moderate risks of infertility associated with aging.

2.4 Summary of literature review

Infertility has been given casual attention in developing countries like Kenya because of the preoccupation by researchers and policy makers on the problems of higher fertility. In addition, most of the available studies on infertility have centered on its causes and ignored the prevalence and trends which is important in establishing where there are differentials and changes with time in the reorientation of policies and programs.

Demographers define primary infertility as the proportion of ever- married women who are not using contraception but are childless even at the end of their fecund period (40-49 years old) (Bentley et al, 2000; Sekadde-Kigondu et al, 2005). Most researchers on infertility in sub-Saharan Africa acknowledge that this definition provides precise estimates on infertility because it ensures adequate exposure to childbearing.

Also, contraception seems not to affect estimates of primary infertility because in most cases, infertile women would not use contraceptives.

Recent studies on infertility indicate that it is feasible to estimate national levels of either primary or secondary infertility from population based surveys such as the Demographic and Health Surveys (DHS) as well as population censuses data. These studies indicate that despite the high fertility rates experienced in sub-Saharan Africa, infertility rates are equally higher compared to other parts of the world such that it is not only an individual's concern but also a public health problem. However, infertility in Kenya is estimated to be relatively low at 2.2 percent and 2.4 percent from the 2003 and 1998 KDHS data respectively. Despite the fact the proportion affected is low, infertility is a human rights issue (ICPD, 1994) which deserves attention as well as to preserve fertility. In these societies, childbearing is highly regarded such that infertility can lead to divorce, depression and violence.

However, these studies also indicate that there is a declining trend in the prevalence of both primary and secondary infertility in sub-Saharan Africa for these countries in the low fertility belt. The reason for the decline is not clearly established but it could be associated with the measures taken for prevention and treatment of STIs as a preventive measure for HIV/AIDS.

There are findings indicating that the major preventable causes of infertility in sub-Saharan Africa are STIs – chlamydia infection and gonorrhoea in particular. There are variations for instance by region, religion, place of residence and ethnicity in the levels of infertility suggesting differences in patterns of sexual behaviour which is crucial in determining the levels of infertility.

CHAPTER THREE: METHODOLOGY

3.1 Data source

This study utilized data drawn from Kenya's 1989 and 1999 population censuses data on parity.

3.2 Methods of data analysis

The analysis was restricted to ever-married women in order to ensure a valid sample for estimation of primary infertility and exposure to child bearing. It is cautioned that underestimation would occur if estimates of infertility were restricted to currently married women because it's possible that some cases of divorce or remarriage could be associated or due to infertility especially in the African setting where childlessness is seen as a misfortune.

The parity progression ratio (PPR) model was adopted in this paper because of its simplicity and has a more demographic angle.

$$PPR_i = \frac{W(i+1)}{W_{i+}}$$

Where W_{i+} is the number of ever married women with parity i and above and PPR_i is the probability that a woman of parity i will ever move to (i+1)-th parity. Suppose the extent of primary infertility for the i-th parity is K_i, then

$K_i = 1 - PPR_i$ Where i = 0 (parity zero)

Also, descriptive analyses such as graphs were used to illustrate the trends in primary infertility over time.

CHAPTER FOUR: LEVELS, TRENDS AND DIFFERENTIALS IN PRIMARY INFERTILIY

4.1 Introduction

This chapter presents the basic findings of the study of the levels, trends and differentials in primary infertility in Kenya.

4.2 Levels in primary infertility

Table 4.1 shows a summary of levels in primary infertility in Kenya. The level of primary infertility in Kenya for ever-married women aged 40-49 years in 1989 census was 2.6 percent and it increased slightly in 1999 to reach 2.8 percent. The proportions of childless women in 1999 were higher than the proportions in 1989 for all the age groups apart from the age group 50+. As expected from the literature review, primary infertility rate in Kenya estimated from children ever born data for ever married women between age 40 to 49 in Kenya is about 3 percent which is relatively low. However, the magnitude of primary infertility in Kenya is higher for the age group 50+ since it shows rising infertility of 3.9 and 3.6 in 1989 and 1999 censuses respectively.

Table 4.1 : Primary infertility in Kenya by 5 year age groups

Age Group	1989 Census	1999 Census
15-19	33.5	44.7
20-24	10.4	15.5
25-29	4.2	6.6
30-34	2.9	3.5
35-39	2.5	2.8
40-44	2.5	2.8
45-49	2.7	2.8
40-49	2.6	2.8
50+	3.9	3.6

Table 4.2 illustrates comparative prevalence rates in primary infertility among countries in sub-Saharan Africa. It is evident that variations exist in the prevalence of primary infertility with Central African Republic having the highest level of 8.5 percent while Rwanda and Burkina Faso have the lowest levels with 0.9 percent from the 1994, 1992 and 1998 DHS data respectively. Kenya and Namibia ranks in the middle with 2.4 percent from the 1998 and 1992 DHS data respectively.

Table 4.2: Percentage of childless women aged 40-49 years from DHS data
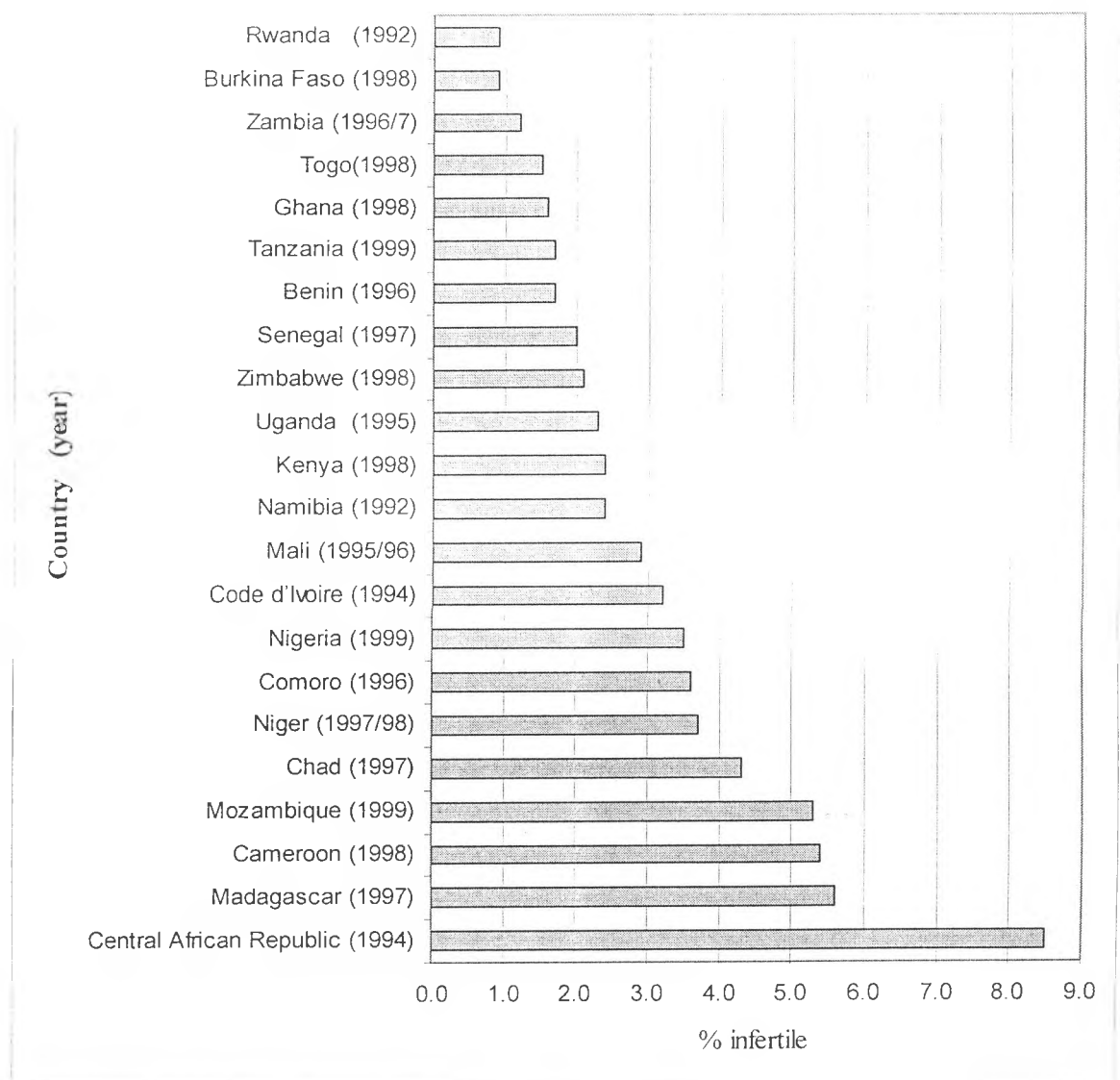
Source: Chepng'eno et al, (2005)

4.3 Trends in primary infertility in Kenya

Fig. 4.1 shows that there was a slight increase in primary infertility rate in Kenya overall for the year 1999 across all the age groups compared to 1989 population census. It can be noticed that primary infertility rates for the younger cohort aged 15-19 is in the range of 30-45 per cent. Such a high rate is mainly due to physiological immaturity of these women. Looking at the trends in primary infertility and the demographic situation in Kenya whereby for the past two decades fertility has been stalling, there seems to be no relationship.

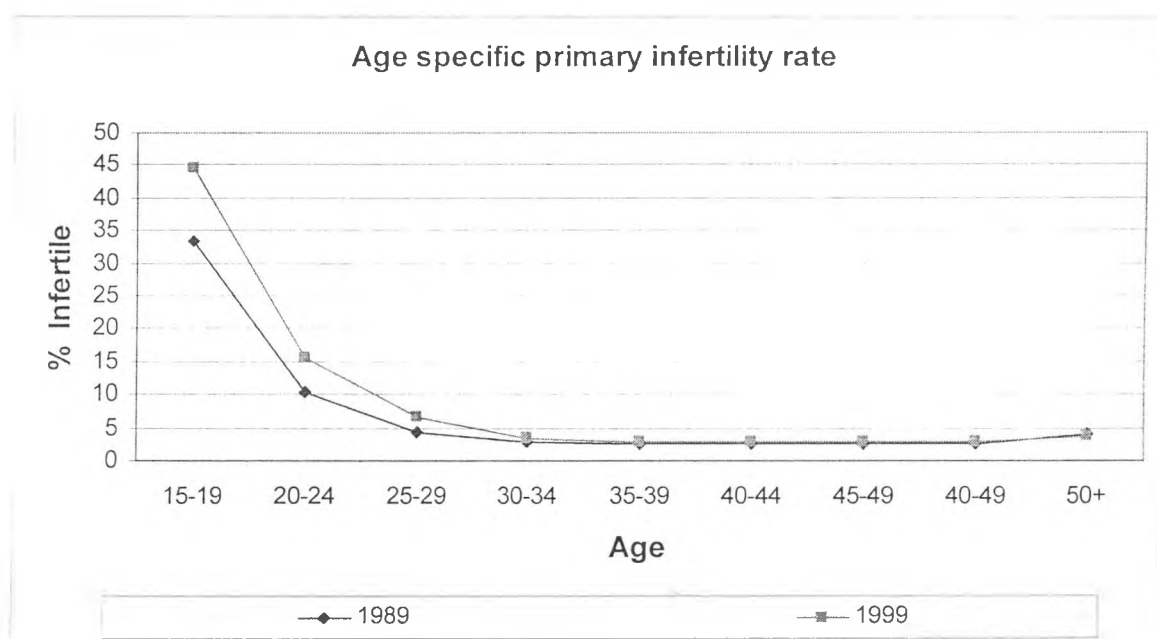**Fig. 4.1: Age Specific Primary Infertility Rates in Kenya**

Table 4.3 shows levels in childlessness for the urban population in Kenya for ever-married women aged 40-49 years in 1999 declined compared to 1989 while in the rural population there was an increase. Although, there was an overall increase in women who were childless from the 1999 population census as compared to 1989, the increase is

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attributed to the rural population. It is also evident that the percentage of childless women in urban population is higher as compared to the rural population in both 1989 and 1999 across all the age groups. Overall, percentage of childless women in both 1989 and 1999 is much higher in the urban population for the age group 50+.

Table 4.3: Trends in percent of childless women by place of residence, 1989 and 1999

Age Group	Urban		Rural	
	1989	1999	1989	1999
15-19	37.0	47.4	32.7	44.0
20-24	15.2	22.0	9.2	13.6
25-29	7.2	10.6	3.5	5.3
30-34	4.9	5.7	2.5	2.9
35-39	4.2	4.3	2.2	2.4
40-44	4.4	4.2	2.3	2.6
45-49	4.8	4.2	2.5	2.6
40-49	4.6	4.2	2.4	2.6
50+	6.5	5.9	3.8	3.4

4.4 Differentials in primary infertility in Kenya

The following discussion looks at differentials in primary infertility in Kenya by three variables namely: region, education and place of residence

4.4.1 Infertility by place of residence

As expected from the literature review, variations exist in the proportions of ever married women who are childless between the rural and urban populations as illustrated in Figure 4.2. Primary infertility in Kenya is more prevalent in urban compared to rural areas across all the age groups in both 1989 and 1999 population censuses. This implies that preventive measures should be focused more on urban population.

Figure 4.2: Primary infertility in Kenya by place of residence, 1989 and 1999
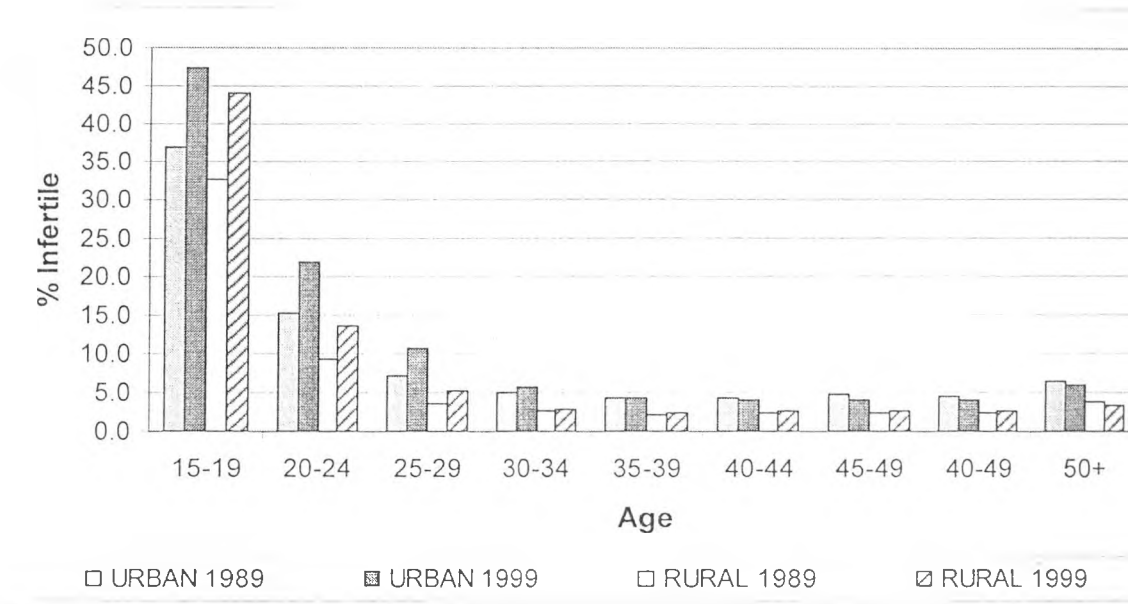
4.4.2 Infertility by education

In Table 4.4, ever-married women aged 40-49 years with higher level of education in 1989 had the highest percentage of childlessness at 5 percent. In the same year, the percentage of ever married women aged 50+ with higher level of education is also highest at 10.6 percent. This could be associated to postponement in childbearing by women with higher level of education. However, this result is also contradictory especially if childlessness is linked with causes such as STIs and malnutrition because highly educated women are more knowledgeable and can afford medical care and proper nutrition. This finding also suggests that ever married women in the age group 40-49 with no education tend to have higher proportions of childlessness after those with higher education. This concurs with the literature review because this group of women tends to

be ignorant of their reproductive health and therefore is more likely to suffer from infertility related problems.

Table 4.4: Proportion childless in Kenya by level of education, 1989

Level of Education	15-19	20-24	25-29	30-34	35-39	40-44	45-49	40-49	50+
None	34.6	09.7	04.4	03.2	02.8	02.9	03.0	02.9	04.2
Primary	32.2	08.8	03.5	02.6	02.1	01.8	01.8	01.8	02.2
Secondary	39.3	15.1	05.1	02.6	02.4	02.6	03.0	02.8	04.6
Higher	30.0	34.3	16.1	07.4	05.8	04.0	06.1	05.0	10.6

Table 4.5 indicates almost similar results to 1989 census whereby ever married women aged 40-49 with higher level of education have highest percentage of childlessness at 5.4 percent followed by ever married women with no education (3.3 percent). Compared to the 1989 population census data, there is a contradiction since women with secondary education had lower percentage in childlessness compared to those with primary level of education in 1999. There was a sharp reduction in 1999 in the proportion of childless women aged 50+ with higher level of education since it recorded 5.5 percent from 10.6 percent in 1989.

Table 4.5: Proportion childless in Kenya by level of education, 1999

Level of Education	15-19	20-24	25-29	30-34	35-39	40-44	45-49	40-49	50+
None	47.1	15.0	06.3	03.9	03.2	03.3	03.2	03.3	03.9
Primary	43.1	13.1	05.2	03.2	02.6	02.6	02.4	02.5	02.8
Secondary	53.4	23.2	08.7	03.5	02.2	02.0	02.1	02.0	04.0
Higher	36.0	24.5	18.7	09.1	06.4	05.7	05.1	05.4	05.5

4.4.3 Infertility by region

As expected from the literature review childlessness for ever married women aged 40-49 is evident in the population of Nairobi and Coast provinces as illustrated in Table 4.6. Coast province records the highest primary infertility rate of 5.1 percent which is more than twice that of Central province (2.1 percent) followed by Nairobi with 4.4 percent and then Nyanza province with 4.1 percent. However, the table also indicates that the levels of childlessness across all the provinces are much higher for the age bracket 50+ with Coast province having the highest level of 7.2 percent.

Table 4.6: Primary infertility in Kenya by province, 1989

Province	15-19	20-24	25-29	30-34	35-39	40-44	45-49	40-49	50+
Nairobi	37.7	16.6	08.1	05.5	04.4	04.0	04.7	04.4	06.0
Central	32.1	09.6	03.5	02.3	01.9	02.0	02.3	02.1	03.5
Coast	36.0	12.4	06.3	04.6	04.2	04.9	05.3	05.1	07.2
Eastern	32.5	09.4	03.2	02.2	01.9	02.2	02.4	02.3	03.8
North Eastern	55.2	17.3	05.4	03.0	02.0	02.2	02.3	02.2	03.7
Nyanza	29.4	09.1	03.8	03.2	03.2	03.8	04.5	04.1	05.1
Rift Valley	33.0	09.3	03.6	02.4	02.1	02.0	02.3	02.2	04.2
Western	30.0	09.3	03.9	02.9	02.6	02.5	02.5	02.5	03.1

Table 4.7 shows the regional differential in childlessness from the 1999 population census data. The 1989-99 decade indicates that childlessness for ever married women aged 40-49 was still evident in the populations of Nairobi and Coast provinces. However, there was a remarkable decrease in the proportions of childlessness in Coast province since it recorded 4.2 percent in 1999 from 5.1 percent in 1989. The findings also suggest that Nyanza province became the new giant in childlessness by recording 4.7 percent from 4.1 percent in 1989 which is a sharp increase in childlessness for the ever

married women in the age group 40-49 across the provinces. In addition, such results indicate that although the 1989-99 decade had recorded an overall increase in the national estimates on the levels of primary infertility in Kenya, variations existed with provinces like Coast, Central, Eastern, North Eastern, and Rift Valley depicting a declining trend while Nyanza and Western provinces showing an upward trend. Table 4.7 also shows that compared to 1989, primary infertility for ever married women aged 50+ exhibited a declining trend across all the age groups with Coast province showing a remarkable improvement.

Table 4.7: Primary infertility in Kenya by province, 1999

Province	15-19	20-24	25-29	30-34	35-39	40-44	45-49	40-49	50+
Nairobi	48.6	23.9	11.9	06.4	04.7	04.5	04.1	04.3	05.9
Central	49.6	16.1	06.2	02.8	01.9	01.9	01.7	01.8	02.6
Coast	45.2	17.3	09.0	05.4	04.3	04.0	04.3	04.2	05.9
Eastern	47.3	14.9	05.1	02.5	01.9	02.0	01.9	02.0	03.5
North Eastern	19.1	19.3	06.5	03.0	02.0	02.1	01.9	02.0	03.4
Nyanza	40.3	14.3	06.6	04.4	04.0	04.6	04.8	04.7	04.7
Rift Valley	45.5	13.8	05.2	02.6	01.9	01.8	01.7	01.8	02.9
Western	41.1	12.9	05.4	03.4	03.0	02.9	03.1	03.0	03.0

CHAPTER FIVE: SUMMARY AND RECOMMENDATIONS

5.1 Introduction

This chapter contains a summary of the findings and recommendations both for policy and further research.

5.2 Summary of findings

This study was nation-wide in scope having used the 1989 and 1999 population censuses data. It set out to estimate the levels of primary infertility in Kenya as well as determining the trends and differentials of primary infertility in Kenya. In stating the problem, the study underscored the fact that most studies on infertility have focused more on the causes at the expense of prevalence which is crucial in determining whether there has been changes overtime in the light of treatment and preventive measures taken to reduce infertility in Kenya.

Primary infertility in Kenya for women aged 40-49 years in 1989 census was estimated to be 2.6 percent which rose to 2.8 percent in 1999. Across all the age groups the proportions of childless women in 1999 were higher than those of 1989. As expected from the literature review, primary infertility rate in Kenya estimated from children ever born data for ever married women in Kenya is about 3 percent. However, the results also indicate that the magnitude of primary infertility in Kenya is higher than 3 percent when age group 50+ is factored in the estimation of primary infertility.

Trends in childlessness for the urban population in Kenya for ever-married women aged 40-49 years in 1999 experienced a decline compared to 1989 while in the rural population there was an increase. Consequently, the overall increase in women who were childless from the 1999 population census was associated with rural population.

Ever-married women aged 40-49 years with higher level of education in 1989 and 1999 had the highest percentage of childlessness of 5 percent and 5.4 percent respectively. However, the results also showed that these percentages are higher when women with age 50+ are included in the estimation of primary infertility. They were followed by women in the age group 40-49 with no education.

Primary infertility in Kenya is more prevalent in urban compared to rural areas across all the age groups in both 1989 and 1999.

When analyzed by region, Coast province recorded the highest primary infertility rate of 5.1 percent, followed by Nairobi with 4.4 percent and then Nyanza province with 4.1 percent in 1989. Central province recorded the lowest level of primary infertility at 2.1 percent. However, the findings also suggested the levels of childlessness in these provinces are much higher when the age group 50+ was factored in the estimation of primary infertility.

There were regional variations in childlessness from the 1999 population census data. There was a sharp decline in the proportions childless in Coast province since it recorded 4.2 percent from 5.1 percent in 1989. Nyanza province recorded an upsurge in childlessness for the ever married women in the age group 40-49 by recording 4.7 percent from 4.1 percent in 1989.

5.3 Recommendations

The following discussion presents recommendations both for policy and further research.

5.3.1 Recommendations for policy

1. From the study's findings, important issues touching on reproductive health have been unveiled that require urgent program action. The government continually needs to be on its feet since the problem of infertility has been inadequately addressed at both policy and service levels. From the findings, primary infertility in Kenya increased in the 1989-99 decade. Also, variations still exist in the prevalence of primary infertility in Kenya with urban areas as well as Coast, Nairobi, and Nyanza provinces having higher rates compared to other provinces. This situation confirms the need to target programmes in such a way that is region- specific rather than national. Therefore, inter-regional as well as intra-regional strategies should be put in place.

2. The government and private non-governmental organizations should improve access to quality infertility services at all levels for timely management of infertility and also to reduce the trauma that infertility victims undergo both at the individual and societal level.

3. The government and private non-governmental organizations should enhance training in the management and prevention of infertility at all the levels of health care.

5.3.2 Recommendations for further research

1. The government should encourage research to generate further knowledge on the magnitude of the infertility problem, the predisposing factors, and means to solve them.

2. From the findings of this study, it is evident that future qualitative approaches and more variables should be employed in order to gather better insights on infertility.

3. A study on determinants of infertility in Kenya should be carried out.

4. A study on the factors determining the higher prevalence rate of primary infertility in urban areas and regions like Coast, Nairobi and Nyanza provinces should be carried out.

5. Further research involving in-depth interviews is needed to develop a better understanding of the contribution of infertility to fertility.

6. Further research on secondary infertility should be done since secondary infertility may exist in a much larger extend.

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