" DETERMINANTS OF CONTRACEPTIVE USE IN KENYA"

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D E D I C A T I O N

To my mother Isabella Ipalinyanga and my wife Dr. Elizabeth Ichalutu.

D E C L A R A T I O N

This Thesis is my original work and has not been presented for a degree in any other University.

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This Thesis has been submitted for examination with our approval as the University Supervisors

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A B S T R A C T

With a low level of contraceptive use and poor understanding of the factors responsible for this situation, Kenya requires studies aimed at establishing the determinants of contraceptive use so that these factors can be used in formulating appropriate policies and programs to increase acceptance and use of contraceptives. This is necessary if a substantial reduction in fertility and hence population growth rate has to be achieved via this policy instrument.

This study aims at establishing how the various socio-economic, demographic and behavioural factors as well as the availability of contraceptive services relate to contraceptive use.

The Kenya fertility survey of 1977-78 serves as the basic source of the data for the analysis. This data is of high quality and is reasonably reliable.

Multiple regression analysis is used as the major technique of statistical analysis.

The analysis of the data revealed that the selected variables accounted for 21.5 per cent

variance in current use of contraception among exposed women. The corresponding F-statistic-value of 12.21 was significant at 0.01 level. This means that differentials in the levels of contraceptive use were apparent in the data.

Travel time (Travt), Child mortality experience (CMORT), the number of additional children desired (NACD) and breastfeeding (BREAST) were all found to be inversely related to contraceptive use with correlation coefficients of r= -0.3721, r= -0.0977,, r= -0.14386, and r= -0.21358 respectively.

Wife's education and her employment status, place of residence, husband's employment status and family size were all found to be positively related to contraceptive use. Their correlation coefficients with contraceptive use were r= 0.18259, r= 0.22366, r= 0.04114 and r= 0.02052 respectively.

In conclusion, therefore, all the hypotheses stipulated were confirmed.

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CHAPTER ONE

INTRODUCTION

1.0.1. BACKGROUND

Since the 1950's most developing countries have experienced rising annual population growth rates. While the developed countries such as Austria begun in the 1970's to experience zero population growth rates, the majority of developing countries have continued to maintain high rates of population growth (U.S. Bureau of the census 1980, United Nations (U.N.) 1980, 1983, Nortman 1978).

The rapid population growth experienced in most developing countries has been attributed to high and stable fertility combined with rapidly declining mortality - the decline that has been attributed largely to improvement in medical technology, disease control measures and increased availability of public health facilities (U.N. 1973, Som 1972, Jean 1981).

Although Boserup (1965) and Amin (1972) argue that population growth may promote socio-economic development, the high population growth

rates such as those experienced by the majority of developing countries tend to create development problems with possible retardation on socio-economic development.

Many countries are aware of the relationship between rapid population growth and socio-economic development and have, consequently, adopted policies and programmes aimed at reducing the population growth rates. The policies are often implemented through family planning programmes.

India was the first developing country to establish a national family planning programme in 1952. Since then many developing countries have established policies and programmes to lower fertility. By 1975, 34 developing countries had such policies and programmes and an additional 32 developing countries provided family planning services for non-demographic reasons, that is for health and humanitarian reasons (Mauldin 1975, Nortman 1978; Berelson et al., 1976).

Like many developing countries Kenya's population has been increasing rapidly since the second world war. In 1948 the population was 5.4 million people with an estimated annual

growth rate of 2.5 per cent. In 1962 the population of the country was 8.6 million people with an annual growth rate of 3.3 per cent, and by 1979, it had increased to about 15.3 million people with an estimated annual growth rate of 3.8 per cent (Kenya, Republic of, 1980 World Bank Report No. 3409 KE of April, 1983).

The rapid growth of the population of Kenya is due to steadily increasing fertility combined with rapidly declining mortality. Migration does not play an important role in influencing Kenya's population growth (Henin 1984).

The fertility rate gradually increased from a crude birth rate of 50 live births per a thousand population in 1962 to 53 live births per a thousand population in 1979 (Kenya, Republic of, 1984), whereas the total fertility rate defined as the sum of age - specific birth rates of women over their reproductive span as observed in a given time, increased from 6.8 children per woman in 1962 to 8.2 children per woman in 1977-78 (Henin 1984).

The Kenya Government recognised the need to create a balance between population growth

and economic development when National Development Plans were initiated during early 1960's. The Sessional Paper number 10 of 1965 which gave the overall strategy for development highlighted the concern about the rate of population growth and its impact on resources and the rate of economic development (Kenya, Republic of, (1965).

In 1966 the Kenya Government invited a Population Council Advisory Mission to study the demographic situation in Kenya and make recommendations. On the basis of the mission's report, the Government officially launched the National Family Planning programme in 1967. Family Planning was integrated with Maternal Child Health (MCH) and the Ministry of Health was given the responsibility of implementing the programme. The acceptance and use of Family Planning Services was wholly voluntary and individual's customs and values were to be fully respected even as emphasis was placed on reducing fertility (Kenya, Republic of, 1967).

This does not mean that Family Planning activities were not being promoted hitherto. In early 1950's the first efforts to form a family

planning organization began through the assistance of the Pathfinder Fund. In 1957 the Family Planning Association of Kenya (FPAK) was formed and in 1962 it was affiliated to the International Planned Parenthood Federation (IPPF).

As pointed out earlier the Kenya Family Planning programme was established primarily to bring about a reduction in fertility and hence population growth rates on a voluntary basis. For instance between 1974 and 1978 the Kenya Government aimed at reducing the population growth rate to 3.25 per cent per annum in 1978 from 3.5 per cent per annum in 1975. The long term targets were to reduce the population growth rate to 3.0 per cent per annum by 1980 and 2.8 per cent by the year 2000 (Kenya, Republic of, (1974).

The MCH component of the National Family Planning programme met with considerable success. It is estimated that it covered about 72 per cent of the pregnant women and 19 per cent of the children aged 0 - 5 years during 1975 - 1979 period. However, the Family Planning component of this programme performed rather poorly. The specific goal of reducing fertility and hence population growth rate was not attained by the

end of 1979. The 1979 census data indicated that instead of a decline in the population growth rate, a significant increase had occurred that raised the rate to about 3.8 per cent in 1979 (Kenya, Republic of, 1985).

In a bid to improve the performance of the Family Planning component of the Integrated MCH/Family Planning Programme, the Government established the National Council for Population and Development (NCPD) to co-ordinate the activities of Government Ministries and Non-governmental organizations involved in population and family planning activities, inter alia (Kenya, Republic of, 1985).

Several Non-Governmental Organizations (NGOs) have been involved in population and family planning activities. These organizations include the National Christian Council of Kenya (NCCK), Family Planning Association of Kenya (FPAK), Maendeleo Ya Wanawake Organization (MYWO), Protestant Churches Medical Association (PCMA), the Kenya Catholic Secretariat (KCS) and the Salvation Army (SA).

These organizations, like the Ministry of Health, provide family planning services on request.

1.0.2. PROBLEM STATEMENT

Although family planning activities have officially been promoted for about two decades, the level of contraceptive use in Kenya is low and the reasons why contraceptive use is low are poorly understood.

According to a contraceptive survey of 1974 only about 6 per cent of the respondents had visited a family planning clinic during 1973 and 1974 period (World Bank, 1980). In 1975 the Ministry of Health, The Family Planning Division, estimated that only 2.5 per cent of married women of reproductive ages were using contraceptives (World Bank, 1980 pg 176). The Kenya Fertility Survey of 1977 and 1978 indicates that about 9.3 per cent of the currently married, non-pregnant women who were at the risk of pregnancy were using contraceptives.

In 1978 the user rate for married women was estimated at 7 per cent by the MCH/FP programme. At the same time the user rate for the currently married women of reproductive ages was estimated at 5.2 per cent (Kimani, 1982).

1.0.3. OBJECTIVES OF THE STUDY

This study attempts to establish some of the determinants of contraceptive use in Kenya. More specifically this study attempts:

(a) To examine how the selected socio-economic and demographic variables relate to contraceptive use.

(b) To determine their absolute and relative effects upon contraceptive use.

(c) To make recommendations on the basis of findings.

1.0.4. STUDY JUSTIFICATION

Since the level of contraceptive use is low and the reasons for this apparently low receptivity to family planning poorly understood, Kenya would benefit from studies which are aimed at establishing the determinants of use of contraception so that these factors can be used in formulating appropriate policies and strategies to raise the level of contraceptive use, which is necessary if a substantial reduction in fertility and hence

population growth rate has to be realized via this policy instrument. This is the primary objective of this study.

This study also provides a basis upon which further research can be based. Furthermore this study attempts to present a micro-level test of ideas implied by a few recent demographic theoretical formulations and studies on contraceptive use some of which have been discussed in the next chapter.

1.0.5. SCOPE AND LIMITATIONS

This study focuses mainly on currently married non-pregnant women who believed themselves to be physiologically capable of having another child (i.e. exposed women) because these were the women who were exposed to the risk of pregnancy and for whom contraception was directly relevant.

This study is limited to current contraceptive use among the exposed women. Women who were sterilized for contraceptive purposes were also counted as current users and were included in the analysis as exposed women.

Their inclusion is based on the fact that they were current users and that sterilization is one of the contraceptive methods which are examined in this study.

There are a few limitations of using exposed women as a sub-population for this study. The first limitation arises from the inclusion of the contraceptively sterilized women as fertile and current users since some of them would have become sterile in the absence of sterilization method and therefore would not have counted themselves as fertile. At the same time some sterilized and sterile women may have reported themselves fertile when actually they were not. This appears to be the case with 49 women examined in this study who reported use of sterilization method.

Another limitation is the problem of under-reporting of pregnancy and difficulties in deciding whether or not one is physiologically capable of having another child.

The other limitation arises from the omission of the questions on coital frequency on the Kenya fertility survey questionnaire from which the data for this study were drawn. This

means that the group of exposed women includes women who were not exposed since some of them may have been abstaining from intercourse for non-contraceptive reasons such as decline in sex interest.

Inspite of these few limitations exposed women were chosen as the appropriate sub-population for this study on two grounds:

First this was the group of women for whom contraception was directly relevant since they were at the risk of pregnancy.

Second most recent studies on current use of contraception have used exposed women including contraceptively sterilized women as the denominator (Cleland et al 1981, lightbourne 1980, Elise 1984, Abdulah et al 1984).

These exposed women (4165) were drawn from the Kenya Fertility Survey Raw - data Tape. The Kenya fertility survey covered almost the whole country and the respondents were selected using a Multi-stage sampling technique (Kenya, C.B.S. 1980A).

The entire North-Eastern Province, the districts of Marsabit and Isiolo in the Eastern Province and districts of Samburu and Turkana in the Rift Valley Province were not covered due to the sparsity of the population they contained an estimated 5 per cent of the total population of the country in 1969 (Kenya, Republic of, 1980A)

1.0.6 ORGANIZATION OF THE STUDY

This thesis is presented in five chapters.

Chapter one covers the presentation of the background information, problem statement, the objectives of the study, the justification, scope and limitation of the study.

Chapter two covers the presentation of the relevant literature review, the theoretical framework, hypotheses and variable definitions.

Chapter three covers the source and quality of the data used and the methodology used to analyse the data.

Chapter four covers the presentation of the results.

Chapter five covers the summary of the findings conclusions and recommendations.

C H A P T E R T W O

2.0.0. LITERATURE REVIEW

In this chapter an attempt is made to discuss the relevant literature on the relationship between each of the selected explanatory variables and the current use of contraception.

2.0.1. WIFE'S EDUCATION AND CONTRACEPTIVE USE

Wife's education is one of the socio-economic variables which has been found to affect the use of contraception.

Mazur (1981) argued that contraceptive use increased with the increase in the level of the wife's education. He found the highest contraceptive use among the married women in Poland with secondary and higher education. About 75 per cent of them were contracepting, compared to 42 per cent and 56 per cent who were contracepting among women with less than elementary and elementary levels of education respectively.

Like Mazur (1981), Immerwahr (1981)

indicated a direct, definite and generally monotomic relationship between the years of wife's schooling and the use of contraception among women aged between 15 - 50 years and who were exposed to the risk of pregnancy in Sri Lanka.

Soeradji et al (1982) found that in Java - Bali region in Indonesia education was positively related to the use of contraception. They found that 31 per cent, 46 per cent and 38.8 per cent of exposed women with no education senior education and Academy/University education respectively were contracepting. However, they found that education explained only 0.8 per cent variance in the current use of contraception and they attributed this low contribution to the fact that most of the effect of education on contraceptive use was mediated through the other variables included in the regression model.

Abdulah et al (1984) in a comparative study on contraceptive use in the Commonwealth Carribean countries found a positive relationship between wife's education and contraceptive use. In Guyana for instance, they found that education explained 4.3 per cent and 1.0 per cent variance in current use of contraception among the exposed

Non-Indian and Indian women respectively.

In Trinidad and Tobago education explained 1.4 per cent variance in current use of contraception among exposed women. And in Jamaica, education accounted for about 1.8 per cent variance in current use of contraception among exposed women(Abdulah et al 1984).

Freedman et al (1959, 1969, 1981), using tabular and multiple classification analysis on contraceptive use among married women in the United States, Taiwan and Indonesia found that the wife's education was positively related to contraceptive use. They found that education accounted for only 0.7 per cent variance in current use of modern methods of contraception in Indonesia.

Caldwell (1968A) found that in Nigeria in 1964, the practice of contraception rose steeply with the education of wives; from 5 per cent of the uneducated women ever contracepting to 71 per cent of those with University and other post-secondary training.

Clelland et al (1979) found that in Thailand wife's education was directly related to the use

of contraception and that it explained 0.7 per cent variance in current use of modern methods of contraception among exposed women.

Sahtar (1984), Mamlouk (1982) and U.N. (1979, 1981) though using different statistical techniques found a direct relationship between the wife's education and the use of contraception.

A few studies have attempted to present the percentage distribution of the contraceptors according to the wife's level of education. For instance Ejiogu (1972) found that the majority of the acceptors of the family planning in Kenya between 1968 and 1972 consisted of women with no education (25 per cent) and those who had not completed primary education (49 per cent).

Furthermore the Ministry of Health Annual Report of 1977 indicated that the majority of the acceptors who entered the Family Planning Programme during 1977 had primary education (51 per cent) and almost a quarter (25 per cent) did not have any formal education. (Kenya: Republic of, 1977).

Oyediran et al (1976) observed that the majority of the clients in the Family Health Clinic in Lagos, Nigeria in 1969 and 1970 had either no formal education or only primary education.

However, they were not sure whether or not women who had better education and who were richer procured their contraceptive supplies and related services from private clinics and pharmacies.

Cochrane (1976), Kasarda et al (1976 and Janowitz (1976) argue that wife's education facilitates the acquisition of information on modern contraceptive devices and use.

Kasarda et al (1976) argue that extended schooling beyond primary levels exposes the young people to contraceptive information and materials not often available through familial or other channels.

They also argue that education can influence contraceptive use through its negative influence on family size. The essence of the argument is that education increases the

couple's aspiration for upward social mobility and wealth accumulation and changes the life style and consumption patterns which reduce the desire for large families. Also education influences couples to have few better educated, fed and clothed children rather than having many poorly fed, clothed and educated ones.

Education also influences the use of contraception through its negative effect on breastfeeding. Educated and working women tend to substitute contraception for breastfeeding as a means of fertility regulation. (Millman 1985, Suryak 1981).

In conclusion, many studies indicate a consistently positive relationship obtaining between wife's education and the use of contraception.

However, the wife's education has been shown to account for only a small percentage of the variance in the use of contraception.

2.0.2. WIFE'S EMPLOYMENT STATUS AND CONTRACEPTIVE USE

This is an important indicator of the wife's socio-economic status and we would expect an

increase in this variable to lead to a corresponding increase in the level of contraception, other variables held constant.

The studies done by the Population Division of the United Nations (UN 1979A, 1981) on contraceptive use, indicate that the wife's employment status has a consistently positive relationship with contraceptive use. However, these studies point out that the relationship between the two variables is often weak.

A study * which was done in Cali City in Western Colombia among a probability sample of 655 married women in a predominantly poor and working class section of the city indicated that women who were in employment were more likely to use contraception than their unemployed counterparts. The study found that 62.7 per cent of the employed women were ever-users while 51.7 per cent of the unemployed women were ever-users.

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* "COLOMBIAN WOMEN WHO WORK ARE MORE LIKELY TO USE CONTRACEPTION" INTERNATIONAL FAMILY PLANNING PERSPECTIVES VOLUME 5 NO. 4 1979 pp.165-166

Caldwell (1968B) found a positive relationship obtaining between wife's occupational status and contraceptive use in Ghana.

Mamlouk (1982) in a comparative study found a negligible difference in the levels of contraceptive use between the working and the non-working women in Costa Rica, Jordan and the Republic of South Korea. She found that in the Philippines and Panama, the use of contraception among working women was 14 per cent and 17 per cent respectively, higher than among non-working women. However, in Peru she found that women who were employed used contraception at the rate of 20 per cent lower than the unemployed women. She did not provide an explanation for this unexpected result.

Soeradji et al (1982) indicated that the wife's employment status has little effect on contraceptive use because it was found to explain only 1 per cent variance in use of efficient methods of contraception among exposed women in Java - Bali region in Indonesia. This was insignificant at 0.01 level.

Employment status may affect contraceptive use through a number of ways.

It may affect the use of contraception through its negative effect on family size. Working women contribute to household income and may not require the financial support from their children (Shultz 1969, Kangi 1978). This may consequently lead to the reduction of the need for children as insurance or for old-age support.

Poor people tend to depend very much on the financial support that their children give them especially during the old age and therefore their strong need for large family size. But as a couple becomes financially secure the desire for a large family size becomes unnecessary and the couple is likely to use contraceptives so as to achieve the desired family size.

The participation of the wife in paid employment which is strongly related to her level of education increases the opportunity cost of childbearing and rearing which leads to the trade off between the quantity and quality of children. The educated and employed couples prefer to have fewer children to whom they can give better food, clothing, education

and other basic needs of life than to have many children to whom they cannot adequately provide with food, education and other needs (Shultz 1969, Kangi 1978).

Also the participation of the wife in paid employment implies that she has to share the time available to her between employment and being a mother. Bottle feeding will be resorted to as a substitute for breastfeeding. And if a wife had been using breastfeeding as means of fertility regulation she may resort to contraception if she wants to avoid an unwanted pregnancy (Millman 1985).

Finally a working woman can easily obtain contraceptive services from either public or private clinics.

In summary many studies cited above indicated that the wife's employment status is positively related to contraceptive use. In this study the same association is presumed to exist between the wife's employment status and her contraceptive behaviour.

2.0.3. HUSBAND'S EMPLOYMENT STATUS AND CONTRACEPTIVE USE

This is another indicator of the wife's socio-economic status. On this criterian we would expect contraceptive use to be positively related to this variable.

Abdulah et al (1984) found that in Trinidad and Tobago contraceptive use was greatest among women whose husbands were professionals, administrators and clerks. The second highest use of contraception was among women whose husbands were salesmen and servicemen.

Although there were differentials in the level of contraception by type of occupation of husband, this variable was found to explain only 0.3 per cent and 0.2 per cent variance in the use of contraception among exposed Non-Indian and Indian women respectively in Trinidad and Tobago.

In Guyana husband's employment status was found to explain 1.2 per cent and 0.6 per cent variance in use of contraception among exposed Non-Indian and Indian women respectively,whereas in Jamaica it explained 2 per cent variance in

use of contraception (Abdulah et al 1984).

Soeradji et al (1982) found that in Java - Bali region in Indonesia husband's employment status explained about 1 per cent variance in use of contraception. This was insignificant at 0.01 level.

Freedman et al (1981), using a multiple classification analysis, found that the husband's employment status was positively related to the use of contraception and it explained 2.95 per cent variance in use of contraception among exposed women in Indonesia.

In Thailand husband's employment status explained 3.3 per cent variance in use of contraception among exposed women (Clelland et al 1979).

2.0.4. FAMILY SIZE AND CONTRACEPTIVE USE

This is one of the demographic variables which have been found to be positively associated with the use of contraception.

Caldwell (1968B) found that in Ghana in 1963 family size measured in terms of children

ever born by those surviving was found to be positively related to the willingness to use contraception among the women.

Palmore et al (1976, 1979) found that in Thailand women who had reached or exceeded their desired family sizes used contraception more than those women whose desired family sizes had not yet been attained.

Dierdre (1979) found that among the married Hungarian women . . those with 2 and more living children were the greatest users of contraception. He found that 85 per cent of them were contracepting, compared with 27 per cent and 69 per cent among those with no child and with one child respectively. This study demonstrates a positive relationship between family size and contraceptive use among the Hungarian women exposed to the risk of pregnancy.

However, the United Nations study on the use of contraceptive (U.N. 1979A) indicated that no pattern characterized the difference in contraceptive use with regard to family size.

The study, nevertheless, found that in the republic of Korea (data of 1965, 1971) and urban Morrocco, contraceptive use was more closely related to large than to small family size.

Freedman et al (1981) found that in Indonesia the use of modern methods of contraception increased from a low of about 23 per cent for women with 0-2 living children to 37 - 41 per cent for women with 3 or 4 and then to 44 per cent among women with 5 and more living children. They found that family size explained 3.9 per cent variance in use of modern contraceptive methods in Indonesia. It was the second most important explanatory variable after region of residence.

In contrast to the findings of the United Nation's studies (U.N. 1979A) on contraceptive use in the republic of Korea, Namlouk (1982) argued that in the Republic of Korea, Thailand, Colombia and the Dominican Republic, the use of contraception tended to decline rather than increase with increase in family size. She however, found an increasing tendency towards

contraception as the family size increased in Bangladesh and Fiji. She attributed the decline in contraceptive use with increase in parity to the more traditional attitudes among the higher parity old women since they were more likely to be less educated, less aware of the modern methods of contraception and had lower motivation to use contraception than the young women.

Soeradji et al (1984) found that in Java - Bali region in Indonesia the use of contraception increased from a low of 3.1 per cent among exposed women with no living child to 48.7 per cent among women with at least 5 living children and that family size explained 5.6 per cent variance in use of modern methods of contraception. It had the strongest influence because it explained 34.3 per cent of the 17.2 per cent variance that all the 12 explanatory variables included in the regression model explained.

Abdulah et al (1984) found that among the Non-Indian and Indian women in Guyana, family size explained 3.1 per cent and 6.9 per cent respectively variance in use of contraception. Among the Non-Indian exposed

Guyanan women, family size was second to the wife's level of education in predictive power, whereas among the Indian Guyana women it was the more powerful explanatory variables, explaining 60.5% of the 11.4 per cent variance in use of contraception that all the six explanatory variables included in the regression model explained.

In Trinidad and Tobago family size explained 1.9 per cent and 5.6 per cent variance in use of contraception among exposed Non-Indian and Indian women respectively. And in Jamaica, contraceptive use increased with family size upto 5 living children and then declined. It explained 3.0 per cent variance in use of contraception (Abdulah et al 1984).

In summary . many studies indicate a positive relationship existing between family size and contraceptive use. Although family size is positively related to contraceptive use, it accounts for a little variance in contraceptive use.

In this study a similar relationship between family size and contraceptive use is expected to exist.

2.0.5. TYPE OF PLACE OF CURRENT RESIDENCE AND CONTRACEPTIVE USE

Many studies on contraceptive use indicate that the type of place of current residence more often than not does affect the use of contraception.

For instance the Bangladesh Fertility survey of 1975 and 1976 found that among women exposed to the risk of pregnancy 28 per cent of them residing in the urban areas had used contraception at sometime compared to 12 per cent of the rural based women.

A survey *[1] conducted in a Brazilian state of Sao - Paulo found that urban women were more likely to contracept than their rural based counterparts. Contraceptive use was greatest in the interior city of Sao - Paulo, 66 per cent of the residents were contracepting and in Sao - Paulo city where 63 per cent of the exposed women were contracepting. In comparison only 59 per cent of women living in rural areas were contracepting.

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*[1] "FIRST SURVEY FINDS HIGH LEVEL OF METHOD USE IN A BRAZIL STATE OF SAO PAULO."

INTERNATIONAL FAMILY PLANNING PERSPECTIVES, VOLUME 5 NO. 3 DECEMBER 1978

Caldwell and Igun (1975) found that the type of place of residence influenced the use of contraception among women in Southern Nigeria. They found that 12 per cent, 7 per cent and zero per cent of the women residing in the capital, other urban areas and countryside respectively had ever used modern contraception.

In Philippines *[2] in 1981 urban women were found to/more likely to contracept than the rural based women. About 60 per cent of urban women and 42 per cent of rural women were found to be contracepting.

/be

In Egypt a national fertility survey conducted found that 52 per cent of the urban women and only 16 per cent of the rural women were contracepting (Awad et al 1983, pp 99).

Lightbourne (1980) in a comparative study involving nineteen developing countries found large urban - rural differentials in the levels of contraceptive use, with the urban exposed women being the greatest users of contraception.

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*[2] "WORLD FERTILITY SURVEY PHILIPPINES: MANY WOMEN AT RISK OF PREGNANCY USE NO CONTRACEPTIVE METHODS." INTERNATIONAL FAMILY PLANNING PERSECTIVES VOLUME 7 NO. 3, PLANNED PARENTHOOD WORLD POPULATION, NEW YORK.

Soeradji et al (1982) found that in Indonesia rural women were generally more likely to use contraception than their urban counterparts. In their study 34 per cent of the rural women were found to be contracepting. While 30 per cent of the urban women were found to be contraceptors. When they controlled for the effects of other variables, the difference in the level of contraceptive use among urban and rural women was about 11 per cent. This unexpected result is explained by the fact that the Indonesian Family Planning programme has concentrated its efforts in rural areas and has involved the local communities in the management of the programme (Indonesia, National Family Planning Co-ordinating Board 1984).

However, the type of place of residence explained 0.2 per cent variance in contraceptive use among exposed women in Java - Bali region in Indonesia (Soeradji et al 1982).

Abdulah et al (1984) found that in Guyana, Jamaica, Trinidad and Tobago, use of contraception was higher for urban women than in the rural areas. However, in Trinidad and Tobago the difference in the level of contraceptive use

between the urban and rural women was very small.

The place of residence influences contraception through many ways. For instance women residing in urban areas are more exposed to contraceptive information and have a greater access to contraceptive services than the rural women.

Urban life may also imply greater access to commercial infant foods resulting in curtailment of breastfeeding and substitution of contraception for breastfeeding, increased opportunities for outside activitity (e.g. work) that compete with breastfeeding and childbearing and rearing.

Urban life is also more permissive of non-traditional behaviours than the rural environments (Millman 1985).

2.0.6. THE NUMBER OF ADDITIONAL CHILDREN DESIRED AND CONTRACEPTIVE USE

This is one of the fertility preference variables which is presumed to be negatively association with the use of contraception.

Many studies especially in Asia indicate

that women who desire no more children have a higher rate of use of contraception than women who desire more children. For instance Freedman, et al (1981) found that in Indonesia exposed women who wanted no more children used contraception more than those women who wanted more children.

However, many studies have indicated that only a small percentage of exposed women who indicate that they do not want more children, use contraception. This large discrepancy in the stated wish for no more children and the actual use of contraception has led some investigators to question the validity and reliability of this motivational variable and pointed out the possibility of some respondent giving responses that are grossly biased towards smaller family sizes (U.N. 1979,A).

In this study a negative relationship between this variable and contraceptive use is presumed.

2.0.7. THE DURATION OF BREASTFEEDING AND CONTRACEPTIVE USE

Many authors have argued that in most parts

of the world particularly the developing countries, many couples adopt breastfeeding and abstinence as means of fertility regulation and for protecting the health of both the child and mother. With this long reliance in breastfeeding and abstinence, many women reject the modern methods of contraception (ECA, Africa 1979).

Zuryak (1981) analysed the relationship between breastfeeding and contraceptive use among 273 Lebanese women and found a significant negative association between the duration of breastfeeding and the probability that a woman will start contraception postpartum. Thus, the shorter the duration a woman breastfeeds, the more likely she is to start contraception postpartum, independent of other socio-economic characteristics. She used a multivariate probit linear regression analysis.

Bonghaarts et al (1981) using data from Fertility Surveys conducted in a number of developing countries namely Bangladesh, Indonesia, Sri Lanka, Jordan, Guyana, Colombia and Panama, found negative relationship between the duration of breastfeeding and contraception among exposed women in Indonesia, Guyana, Colombia,

Jordan and Panama.

However, they found a positive association between breastfeeding and contraceptive use among exposed women in Bangladesh. This is one case where both breastfeeding and contraception have been promoted as complementary rather than as substitutes.

Millman (1985) using data from a series of KAP (Knowledge, Attitudes, and Practice of Contraception) Surveys of 1967, 1973 and 1980 found that in Taiwan breastfeeding and contraception were negatively related. Her analysis found that the desire for fertility regulation was one reason for breastfeeding and argued that the availability of more reliable means of fertility regulation may have led some women to deliberately choose to breastfeed less than they might otherwise have done. Furthermore she argued that some women who may wean their children early or choose not to breastfeed for reasons unrelated to fertility regulation may be motivated to adopt modern method of contraception because of the relatively short period of postpartum ammenoreal resulting from their choice.

The measurement problems associated with this variable may introduce some biases in the regression result. In some K.A.P. Surveys there is a large proportion of women who indicate that they are still breastfeeding without indicating for how long they had breastfed prior to the survey.

2.0.8. ACCESS TO CONTRACEPTIVE SERVICES

Dow et al (1980, 1981) observed that proximity to a source of contraceptive service may have critical effect on the probability that a potential client will or will not actually become a contraceptor. In their study among Kenyan rural women, they found that women who had said that they were near to a source of contraceptive services were significantly more likely to have visited the facility than the women who lacked access, with 31.7 per cent of the former group and 18.2 per cent of the latter group indicating that they had been to such a facility. However, it should be pointed out that visiting a facility does not necessarily imply that the visitor will actually become a contraceptor.

Chen et al (1983) argued that other things being constant, accessibility to contraceptives has a strong positive effect on contraceptive use for two reasons.

First by improving the knowledge of the available contraceptives and second by removing a distance barrier to acceptance of contraception and continued use. Chen et al (1983) carried out their study among a sample of 1915 married women aged 15.- 44 interviewed in the Guatemala National Survey of 1979 and found out that contraceptive use decreased with increase in travel time.

Novak et al (1983) in a comparative study involving five developing countries namely, Costa Rica, Thailand, Colombia, Honduras and Nepal found that (except for Thailand) travel time to the source of contraceptive services was a very important determinant of contraceptive use.

Use of contraception was highest among the exposed women whose travel time was less than 15 minutes, decreased slightly for those whose travel was between 15 minutes and one hour and then declined at an increasing rate for those furthest away.

Tsui et al (1981), using data from World Fertility Survey of six countries namely, Bangladesh, India, Korea, Mexico, Malaysia and Thailand on contraceptive use among exposed women aged 20 - 44, found high levels of contraceptive use in communities with high levels of contraceptive availability.

Elise (1984) argues that the impact of accessibility on contraceptive use is rather small once a source is known. According to him knowledge of source is more important than the actual accessibility.

In this study accessibility of contraceptives is measured by travel time. Travel time has for a long time been used as a measure of accessibility of contraceptive services (Chen et al 1983).

2.0.9. CHILDHOOD MORTALITY AND CONTRACEPTIVE USE

There is scanty information on the relationship between childhood mortality and contraceptive use.

Although among the Yoruba women in Nigeria, mothers most likely to have used contraceptives had lost one child, use of

contraception was found to decrease with the increase in the number of child deaths (Caldwell et al 1976).

However, they argued that since the older women who had greater experience of child mortality were also less educated, it was difficult to distinguish an independent effect relating experience of child mortality to a decreasing willingness to use contraceptives.

The United Nation Study of 1979 indicates a negative relationship between child mortality and contraceptive use. Child mortality creates a desire to replace a child or to insure against future child mortality. Hence childhood mortality affects contraceptive use through the desire for more children to ensure that the desired number of children survive to adulthood.

However, Scrimshaw (1979) argues that high childhood mortality may signal a readiness to initiate vigorous family planning effort rather than the reverse. This observation questions the validity of the widely held opinion that in all countries whose childhood mortality is high parents will try to produce enough children to ensure against future child mortality

or will invariably try to replace dead children.

In this study childhood mortality measures the total experience of child mortality that a respondent may have suffered, measured in terms of the total number of children dead; and this variable is assumed to be inversely associated with contraceptive use.

In conclusion, it is apparently clear, from the literature review presented above, that very few studies have been carried out on contraceptive use in kenya. It, therefore, means that there is a wide gap in knowlegde on contraceptive use in Kenya. This study is aimed at filling this gap.

2.1.0 THEORETICAL FRAMEWORK

A number of theoretical formulations have been proposed to show how the various background socio-economic, demographic variables and family planning programme efforts may relate to contracptive use at the macro level.

King (1974) in a comparative study involving 19 developing countries attempted to show that contraceptive use is a function of socio-economic setting and the family planning programme efforts. He analysed the effects on contraceptive use of a variety of quantified indicators of family programme effort and socio-economic setting. The family planning programme indicator variables used were: the number of service facilities, personnel and physicians and also expenditure per 1000 married women of reproductive ages. The socio-economic setting variables were per capita gross national product (GNP) female school enrolment rate, urbanisation, newspaper circulation and population density. In this study the family planning programme indicator variables were

found to have a significant independent effect on use of contraceptives; they accounted for 22 per cent variance in the use of contraceptives whereas the socio-economic setting indicator variables accounted for 31 per cent of the variance. The combined effect of social setting plus family planning programme indicator variables was associated with 85 per cent of the variance in contraceptive use.

Berelson and Freedman, (1976) using the theoretical approach proposed by King in 1972 and data from 46 developing countries found that the combined effects of the socio-economic setting and family planning programme effort was associated with about 70 and 80 per cent variance in 1973 contraceptive use rates. However, they consolidated or fmaily planning efforts data into a family planning programme index. The socio-economic setting data was also consolidated into a social setting index. They used the scaling technique and the list of variables developed by Laphan, R.J. and Mauldin, W.P in 1972.

This macro level theoretical approach is suitable for analysing variations in contraceptive use in different geographical areas where family planning programme efforts, socio-economic conditions and contraceptive use rates differ. This approach can also be used to establish the inpact of socio-economic conditions (setting) and family planning programme efforts on fertility rate.

The Population Division of the department of international Economic and Social Affairs of the United Nations Organization has proposed a micro-level model that attempts to describe the manner in which the various socio-economic and behavioural factors influence contraceptive use (U.N. 1979A).

This model is an outgrowth of the micro-economic demographic theories of Easterlin (1975) and others. This model assumes that the currently married couples choose to use contraception on the basis of their desire for more children and their potential ability to regulate fertility.

The model assumes that the effects of the various socio-economic and demographic variables upon contraceptive use are mediated through these intervening variables determining the use of contraception.

It assumes that each of the background variables influences the costs and benefits that parents perceive to be attached to an additional child. It is presumed that the demand for children would fall and contraceptive use would increase with the women's age, family size and the number of living sons. The experience of child mortality is assumed to reduce contraceptive use by creating the desire - either to replace a child or to ensure against future child mortality.

With regard to socio-economic variables the model suggests that a high level of education and outside employment for the wife would result in more widespread contraceptive use both by raising the desire for no more children and enhansing the couple's potential ability to use contraceptives.

The model poses a few practical problems. For instance the base population includes all currently married women irrespective of their exposure status to the risk of conception and hence contraception. Some of the women may be suffering from fecundity impairments and some may be pregnant and as such are not in the immediate need of contraception. Their inclusion in analysis may

distort the results and therefore there is need to exclude all the women who are not currently exposed to the risk of pregnancy.

The model is silent on the measurement of contraceptive use and the couple's potential ability to use contraception. With regard to the couple's potential ability to use contraception, there are no direct measures of this variable. Its effect upon contraceptive use can only be deduced from the effects that the wife's education and employment status have on contraceptive use, net the effects of the desire for more children and other determinants of contraceptive use.

There is also need to specify how contraceptive use is to be measured because different measures are likely to yield different results.

This model contains an important implicit assumption that all parents perform a rigorous cost-benefit analysis before deciding whether or not to have an additional child. This is hardly the case in practice because parents do not have all the necessary information to enable them to perform a cost-benefit analysis.

It should also be pointed out that some parents may want another child but later. They may resort

to contraception simply to delay the pregnancy until when they deem it appropriate.

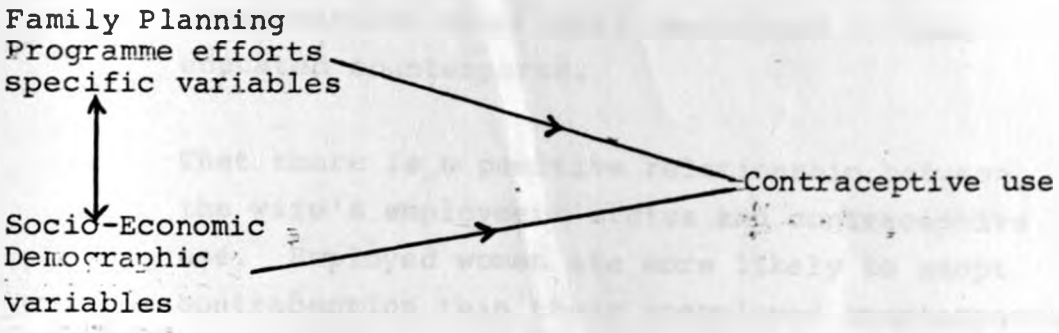
Hermalin et al (1982) proposed a basic theoretical model which states that deliberate fertility regulation is a function of motivation to control fertility and the cost of fertility regulation.

The motivation is assumed to be positively related to contraceptive use whereas the cost of regualtion of fertility is negatively related to contraceptive use. It is assumed that other individual and social factors may enter as determinants of the cost of fertility regulation and motivation but not have a direct effect on contraceptive use.

The cost of fertility regulation include monetary costs and the psychic costs. Examples of these costs monetary cost of contraceptive devices, travel as costs, involved in their procument, as well as travel and physiological costs associated with continued use. Psychic costs are the disapproval associated with contraceptive behaviour arising from familial or community disapproval of contraception.

This model also poses a few practical problems. For instance the model does not specify how key variables such as contraceptive use and psychic costs are to be measured nor does the model specify how the individual's background variable related to the motivation and the cost of fertility regulation.

The present study summarises the three theoretical formulations discussed above in are micro-level theoretical model as follows:-



2.1.1 RESEARCH HYPOTHESIS

From the two theoretical formulations discussed above and the review of relevant literature presented in this chapter a proposition was derived and it is upon this proposition that this study is pivoted. This research proposition states that contraceptive use is determined by socio-economic, demographic, behavioural factors as well as the availability and accessibility of contraceptive services.

2.1.2 STUDY HYPOTHESIS

Out of the general proposition, the following hypotheses were drawn and will be tested in this study.

1. That there is a positive relationship between the wife's education and contraceptive use. Better educated women are more likely to use contraception than their uneducated or less educated counterparts.

2. That there is a positive relationship between the wife's employment status and contraceptive use. Employed women are more likely to adopt contraception than their unemployed counterparts.

3. That there is a positive relationship between the husband's employment status and contraceptive use. Women whose husbands are employed are likely to adopt contraception than women whose husbands are unemployed.

4. That there is an inverse relationship between the experience of child mortality and contraceptive use. Women who have lost many children through death are less likely to adopt contraception than their counterparts who have lost no child through death.

5. Type of place of residence influences a woman's contraceptive behaviour. Urban women are more likely to use contraception than their rural counterparts.

6. Family size is positively related to contraceptive use. Women with many living children are more likely to use contraception than women with few or no living children.

7. Travel time to the nearest source of contraceptive services is inversely related to contraceptive use.

Women who desire many additional children are less likely to use contraception than their counterparts who desire no more additional children.

9. Breastfeeding is inversely related to contraceptive use. Contraceptive use declines with the duration of breastfeeding.

The variables mentioned in these hypotheses exhibit a wide variety of interrelationships among themselves. Zero order partial correlation coefficients will be computed and tabulated to show how these variables are interrelated.

2.1.3 VARIABLE DEFINITION

WIFE'S EDUCATION (WEDUC)

This variable is defined as the number of years spent at educational institution, acquiring formal education.

It will be measured in terms of the total number of years spent at the educational institution e.g. school, college, etc.

The information on this variable was solicited from respondents by asking them whether or not they ever attended school. And if so the highest level of school and highest standard form, year, completed at that level.

TRAVEL TIME (TRAVT) TO THE NEAREST SOURCE OF CONTRACEPTIVE SUPPLIES AND RELATED SERVICES

This variable refers to the respondents estimate of the time that she would take to reach the nearest source of contraceptive supplies and related services.

It is a measure of accessibility of contraceptive services.

DURATION OF BREASTFEEDING (BREAST)

This variable refers to the duration of breastfeeding during the open birth interval as at the time of the interview. It will be measured in terms of months of breastfeeding.

PLACE OF RESIDENCE (PLACE)

This variable refers to the respondent's usual place of residence. It ia a categorical variable; rural, other urban areas, and Mombasa-Nairobi. For the purpose of this study this variable is collapsed into only two categories, urban and rural areas. It will be entered into the analysis (regression) as a dummy variable represented urban, which takes value one if the respondent resides in an urban area, zero otherwise.

CONTRACEPTIVE USE (CONUS)

Contraception refers to the prevention of conception. The means or methods used to prevent or delay conception are called contraceptive methods or simply contraceptives.

In this study twelve such methods are examined. These are the pill,IUD,condom, other female scientific methods (e.g. jelly, cap, diaphragm, tablet, foam), injectables, male sterilization, female sterilization, abstinence, withdrawal, rhythm, douche and folk methods.

The data on contraceptive use was obtained by the the interviewer by ascertaining whether or not the respondent was currently using contraception. Exposed women were asked whether they or their husbands were currently doing anything to prevent pregnancy. Those respondents who said they or their husbands were using any method were further asked to indicate the method they were using.

Contraceptive use as defined here is a binary response variable which takes the value of one if the respondent is a current user, zero otherwise. In chapter 3 there is a further discussion on the measurement of contraceptive use in light of the preliminary results.

WIFE'S EMPLOYMENT STATUS (WOCC)

This variable is defined in terms of whether or not the respondent had any work (employment). The information on the variable was obtained by asking the respondent the kind of work she did. For the purpose of this study those who were classified as"did not work" will be considered as unemployed and those who "did work" are considered as employed. The self-employed were included among those who "did work".

This variable is treated as a dummy variable, taking the value of one if the respondent worked, zero otherwise.

HUSBAND'S EMPLOYMENT STATUS (HOCC)

This variable is defined in terms of whether or not the respondent's husband did any work. It will be treated in the same way as the wife's

employment status.

FAMILY SIZE

This variable refers to the number of the living children, irrespective of their age, sex, marital status and place of residence, that the respondent had as at the time of the interview. It will be measured in terms of the total number of living children of the respondent.
It is a continuous variable.

EXPERIENCE OF CHILDHOOD MORTATITY (CMORT)

This variable refers to the number of children that the respondent had lost through death as at the time of the interview. It will be computed as a difference between the number of children ever born (CEB) and those living. Although this variable measures the total number of children lost through death irrespective of their age at death, it does provide a fairly accurrate estimate of childhood mortality since there is a disproponately high concentration of mortality (deaths) between 0-5 years of life in Kenya (Mott 1982).

THE ADDITIONAL NUMBER OF CHILDREN DESIRED (NACD)

This will be measured in terms of the total number of additional children desired by the respondent. The information on this variable was sought by asking the respondent whether she wanted another child some time and if so how many more children.

CHAPTER THREE

3.0.0. METHODOLOGY

This chapter covers the sources of data, quality of the data and the statistical techniques for data analysis.

This study employs cross-tabulations and multiple regression analysis. A brief discussion on each of these techniques is presented in this chapter.

3.0.1. SOURCE OF DATA

The data used in this study are drawn from the Kenya Fertility Survey (KFS) which was conducted between 1977 and 1978 by the Central Bureau of Statistics (CBS) as part of Kenya's National Integrated Sample Survey Programme(NISSP) and programme of the World Fertility Survey (WFS) (Kenya, Republic of, 1980 A pp. 21).

The KFS covered 8100 women of reproductive ages drawn from nearly the whole country using a multi-stage sampling technique. The entire North-Eastern Province, the Districts of Isiolo

and Marsabit in the Eastern Province and the Districts of Samburu and Turkana in the Rift Valley Province were excluded from the survey due to the sparsity of the population (see appendix 2)

The KFS solicited for information on socio-economic, demographic characteristics of the respondents and their husband's background. In addition information on contraceptive knowledge and use was obtained (Kenya, Republic of, 1980A pp 25).

3.0.2. THE QUALITY OF KFS DATA

In designing the KFS sample and in the actual data collection, emphasis was laid upon obtaining high quality and reliable data. A number of measures were undertaken in a bid to achieve this goal. These included: the selection of the sample that was adequately representative and administratively manageable; using a multi-stage probability sampling technique, accurate mapping of the households, use of nine thoroughly pre-tested versions of the questionnaire and the use of high quality personnel (Kenya, Republic of, 1980 A, pp 26-34).

Inspite of the fact that a lot of complex statistical exercises were undertaken to ensure that the data collected was of high quality and reliable a few shortcomings of KFS data should be noted.

In the first place large discrepancies existed between the cluster population size and the 1969 population projection in most rural clusters and discrepancies also existed between the listed and the expected population in the rural clusters. In clusters where the listed population was below the expected some enlargement of the clusters was done by incorporating the adjacent chusters. And in clusters with higher listed population than the expected, some reduction of the clusters was done. There was also the general problem of under-coverage revealed by the comparison of the listed and the expected population of the selected clusters. It was found that the drawn sample fell short of the expected sample size by about 20 per cent. This was attributed to poor implementation. A recheck of the suspected clusters was carried out and corrective measures were undertaken (Kenya, Republic of, 1980 A pp 31).

With regard to the quality of age-data, a comparison of the KFS age data and the model population derived from the National Demographic Survey of 1977 revealed that there was:

(a) Under-reporting of the children aged 0-4 years, girls aged 15-19 years, women aged 30-34 years and 50-59 years.

(b) Over-reporting of the children aged 5-9 years, girls aged 10-14 years (Kenya Republic of, 1980 A pp 48-52).

Finally the KFS data on contraceptive use, does not give information concerning the duration of use, the efficacy with which the various methods were used and continuity of use. Nor does it contain information regarding the reasons for use or lack of it.

In conclusion, the KFS data is of high quality and is reasonably reliable.

3.0.3. CROSS-TABULATION ANALYSIS

Cross-tabulation analysis will be carried out to establish the distribution of the current contraceptors according to each category of each

of the selected variables.

The cross-tabulation analysis will be done because of its simplicity and appropriateness for comparative purposes. The results of cross-tabulation analysis will be utilized in the analytical interpretation of the findings of the regression analysis.

3.0.4. REGRESSION ANALYSIS

Regression analysis deals with the description of the nature of relationship between dependent and independent variable(s) and to estimate the value of the dependent variable when the values of the independent variables are known.

A simple linear regression equation of the current use of contraception may be expressed as

$$Y' = A + Bx + e$$

where Y' is the current use of contraception estimate, A is a constant, B is the regression coefficient, and e is the error or disturbance term.

The parameters A and B in the equation indicate the form of relation between the

dependent variable Y, the current use of contraception, and the independent varibale X. They do not indicate the accuracy of the estimate of Y'. However, B shows the average amount of change in contraception use per unit change in the independent variable X.

The associated parameter r, measures the degree of association between the variables. This parameter is of paramount importance and therefore found necessary to be used in this study.

In the above equation, it is assumed that variance in the current use of contraception is partly explained by the independent variable X, and partly by the disturbance or error term (e) arising from the uncontrolled variables or measurement error.

In practice, however, the dependent variable, such as the current use of contraception will be affected by a variety of variables rather than by just one. Therefore multiple regression analysis which can incorporate many variables is called for. This study covers many explanatory variables and therefore simple linear regression model is inadequate.

With multiple regression model more than one independent variable can be incorporated into equation. The inclusion of more variables into equation is important in two ways:

First it offers a fuller explanation of the dependent variable since social phenomena are not a product of a single cause but a multiple of causes (Grawoig et al 1971).

Second the effect of a particular independent variable is made more certain for the possibility of distorting influences from the other independent variables is removed (Lewis-Back, 1982).

Multiple regression is suitable for this study precisely because of its ability to disentangle the relative effect of each independent or explanatory variable and their total effect on the endogeneous variable.

The multiple regression model representing the current use of contraception may be given as:

$$Y'' = A + B_1X_1 + B_2X_2 + B_3X_3 + \text{----} B_kX_k + e$$

In this multiple regression model or equation:

Y" is the predicted estimate of the current use of contraceptives. A is a constant or

the intercept where as Bs are the

regression coefficients, X_s are the various explanatory variables, K is the last explanatory variable and e is the error term.

However, when X_s are very many it becomes very difficult to calculate these parameters (A, B_s, e) and the associated correlation coefficient (R). In this study there are nine (9) explanatory variables. The computer regression program of the statistical package for social science will be used to calculate the paremeters.

With the regression model it is possible to select a particular straight line that best describes the trend of the data by the use of the least square method which involves fitting a line through a set of points that minimizes the sum of the squares of the error (SSE) i.e. a line that minimizes the squares of differences between the observed and the predicted variables values of each observed values of an explanatory variable.

The accuracy of the regression line can be assessed through the standard error of estimate (SEE). This statistic is simply the standard deviation of actual values (Y) form the predicted (Y') values of the dependent variable. This statistic will be computed and presented (see table 4.10, appendix I).

The correlation coefficient, r, is always computed and presented together with other parameters of regression analysis. All correlation coefficients range between -1 and +1. If the value is closer to -1 or +1 it indicates that a high correlation exists, but if the value is very low, it shows that a low degree of correlation exists. And if the value is equal to zero indicates a complete absence of correlation.

If the value of correlation coefficient is squared (i.e. r^2 or R^2) it shows the proportion of variability in the independent variable that is explained by the variable or variables X^1, X^2 ....X_n (Goldberg 1969, Nie et al 1975).

The accuracy of the estimates of a regression model lies in the fulfilment of the assumptions upon which the regression analysis is based.

That there is a linear relationship between the explanatory variables and the dependent variables, no specification error, that the variance or error terms are heteroscadastic, that the error terms are normally distributed and that the dependent variable is continous and that the explanatory variables are not highly correlated.

In pactice, it is not always possible to satisfy all these assumptions. In our case for example, contraceptive use is bound to affect and at the same time be affected by some explanatory variables such as family size.

As pointed out in chapter one, contraceptive use is a binary variable i.e. a dichotomous response variable which takes the value of one if the respondent is a current user, zero otherwise. This definition of contraceptive use violates the basic assumptions of regression analysis. The violation of these assumptions may not be very serious when the responses on the dependent variables are evenly distributed.

However, the preliminary analysis of the data revealed that the distribution of the responses are extremely skewed with 90.2 per cent of exposed women giving zero (0) responses.

It has been pointed out that the linear scale of comparison is often not appropriate when the responses on a dichotomous dependent variables are extremely skewed (Clelland et al 1979).

Logit models may be used to overcome this limitation of the linear regression model.
The logit model defines the dichotomous

dependent variable (Y = 1, 0 otherwise) by the log odd (Hanushek et al 1979). The log odd is a ratio of the frequency of being in one group (e.g. of being current user Y = 1) to the frequency of not being in that group (e.g. of being in the group of non-users Y = 0). The log odds are used to measure the effect of the explanatory variables on the dependent variable.

In effect the logit model transforms the dependent variable from negative to positive infinity. Thus the logit models are unbounded with respect to the values of the dependent variable (Hanushek et al 1979).

However, due to the unavailability of the computer program for logit analysis, the use of the general multiple regression analysis was resorted to.

Furthermore the author was encouraged to use regression analysis by the fact most of the recent studies on contraceptive use employed regression analysis (Clelland et al 1979, Soeradji et al 1982, Abdulah et al 1984, Immerwahr 1981).

However, contraceptive use had to be made a continous variable by creating an index of contraceptive use. This was done by giving weights (scores) to the various contraceptive methods used as choice of method reflects both /motivation the users own /and perceived method effectiveness (Immerwahr 1981).

These weights, although crude, do reflect both the users motivation and perceived method use - effectiveness. These scores are also based on the empirical findings on the use - effectiveness of each contraceptive method (Rosenfield 1980, Oldershaw 1975, The Population Crisis Committee 1985). More specifically the ranking of methods that is adopted in this study corresponds to the ranking of contraceptive methods that was done by the Population Crisis Committee in 1985. The method with the highest use-effectiveness has the highest score and vice versa.

Method	Score
Male Sterilization	10
Female Sterilization	9
Injection (Injectables)	8
IUD	7
Pill	6

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Method	Score
Male Sterilization	10
Female Sterilization	9
Injection (Injectables)	8
IUD	7
Pill	6

Condom	5
Other Female Scientific methods (Diaphragm, Cap, Foam)	4
Abstinence	3
Rhythm	2
Folk methods withdrawal, douche	1

With regard to the specification error assumption, an attempt will be made to include as many relevant explanatory variables as possible and to exclude irrelevant explanatory variables. And as was pointed above the KFS data is fairly accurate and reliable and therefore no serious measurement errors are anticipated.

Explanatory variables which will be found to be highly correlated will be treated separately. An examination of the zero - order correlation table which always accompanies the regression result will be used to unveil variables which are highly correlated. This measure will be undertaken in order to avoid the problems of multi-collinearity which can bias the results.

Analysis of the residuals will also be done. The scatterplots of the predicted values

of contraceptive use against the residuals will be computed and used in the analysis. The overall patterns of the scatterplots indicate the violation or the absence of the violation of the assumptions underlying the regression analysis.

In the case of the violation of the heteroskedasticity assumption, the scatterplots may take any of the forms depicted below: (see figure 1).

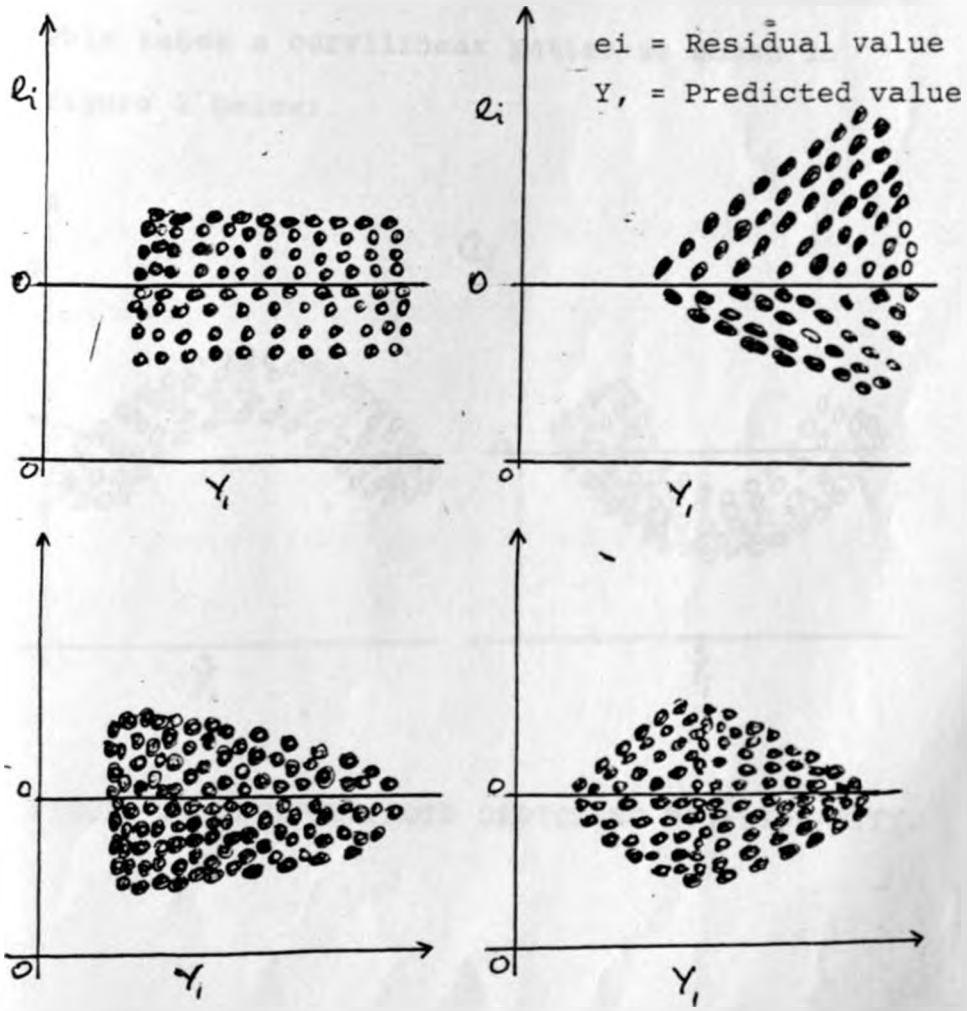


FIGURE 1: SCATTERPLOTS DEPICTING THE VIOLATION OF HETEROSKEDASTICITY ASSUMPTION.

Any abnormality depicted in the above scatterplots may be corrected through the transofrmation of either the explanatory variables (X) or the dependent variable (Y) or both. These data transformations may take the square of these, log of Y or its reciprocal.

Non-linearity is another abnormality that can easily be detected in the scatterplots. This takes a curvilinear patter as shown in figure 2 below:

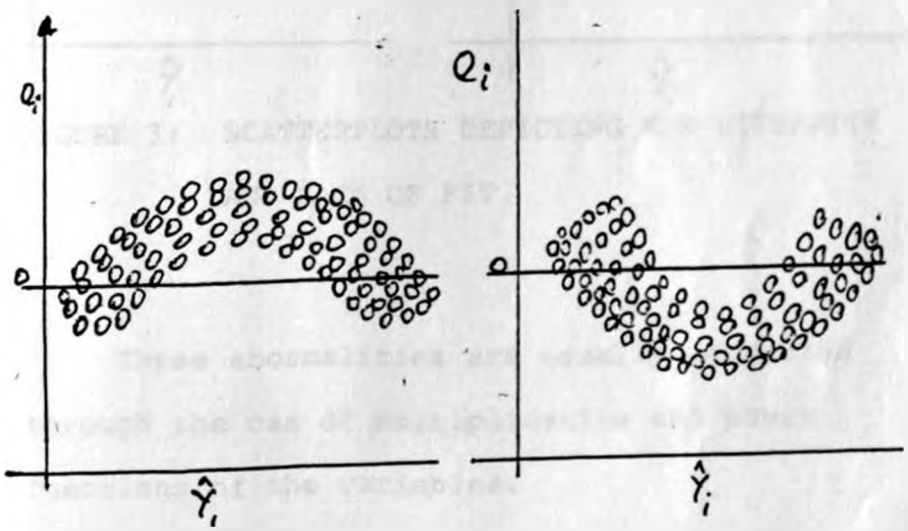


FIGURE 2: SCATTERPLOTS DEPICTING NON-LINEARITY.

In some circumstances non-linearity may exist alongside lack of fit. These abnormalities may be indicated by the scatterplot that takes either of the following patterns as shown in figure 3

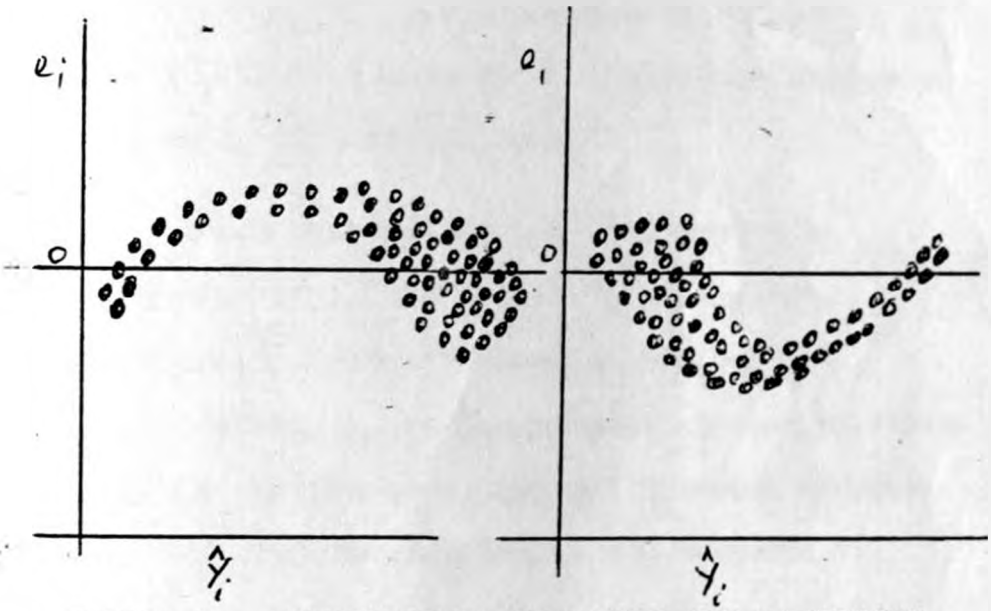


FIGURE 3: SCATTERPLOTS DEPICTING NON-LINEARITY AND LACK OF FIT.

These abormalities are usually corrected through the use of multiplicative and power functions of the variables.

CHAPTER FOUR

4.0.0. STATISTICAL ANALYSIS OF DATA

This chapter deals with the presentation and analytical interpretation of the results.

As was pointed out in chapter 3, this study employs simple percentage (cross-tabulations) and multiple regression analysis as tools of data analysis.

This chapter has been divided into sections A and B for analytical purposes. Section A covers the examination of the socio-economic and demographic characteristics of the current users among the women exposed to the risk of pregnancy. And section B deals with the multiple regression analysis results.

SECTION A

4.0.1. THE PERCENTAGE DISTRIBUTION OF THE CURRENT USERS ACCORDING TO THE WIFE'S LEVEL OF EDUCATION

Table 4.1 below illustrates the percentage distribution of the current users according to the wife's level of education.

The majority of the current users (52.55 per cent) had primary level of education. About 29 per cent of the current users had no

TABLE 4.1 THE PERCENTAGE DISTRIBUTION OF THE CURRENT USERS ACCORDING TO THE WIFE'S LEVEL OF EDUCATION

(A)	(B)	(C)	(D)	(E)
LEVEL OF WIFE'S EDUCATION	NO. OF CASES	NO. OF CURRENT USERS	CURRENT USERS AS PERCENTAGE OF NO. OF CASES	CURRENT USERS AS PERCENTAGE OF TOTAL USERS
No Education	2088	119	5.7	28.88
Primary Education	1771	216	12.2	52.42
Secondary Education	295	74	25.1	18.0
University Education	8	3	37.5	0.7
TOTAL	4165	412	9.87	100.0

education at all. Current users with at least secondary education constituted 18.7 per cent of the total current users.

The same table (column B) indicates that the majority of the women exposed to the risk of pregnancy had no education. About 50 per cent and 45 per cent of them had no education and primary education respectively and finally 7.2 per cent of than and at least secondary education.

Similar results have been found by a number of scholars. For instance Ejiogu (1972) found that the majority of the acceptors of family planning (Contraception) in Kenya between 1968 and 1972 consisted of women with no education (25 per cent) and those who had not completed primary education.

In 1977, it was indicated that the majority of the acceptors (users) who entered the Kenya Family Planning Programme during 1977 and primary education (51 per cent) and 25 per cent did not have any formal education (Kenya, Republic of, 1977).

Although the majority of the current users had primary education, the use of contraception increased from a low of 5.7 per cent among exposed women with no education to a high of 37.5 per cent among exposed women with University education: a difference of 31.7 per cent. It is evident from Table 4.1 column D, that the level of use of contraceptives increased with increase in the level of the wife's education.

Similar results have been found elsewhere.

For instance in Poland in 1981 Mazur (1981) found that 74.7 per cent of the currently married women with secondary education were current users. Whereas 41.7 per cent and 56.1 per cent were current users among the currently married women with less than elementary education respectively.

Like Mazur (1981) Soeradji et al (1982) found that in Java-Bali region in Indonesia education was positively related to contraceptive use with 31 per cent, 46 per cent, 38.8 per cent of exposed women with no education, senior (secondary) education and Academy/University education respectively being current users.

4.0.2. THE PERCENTAGE DISTRIBUTION OF THE CURRENT USERS ACCORDING TO THE WIFE'S EMPLOYMENT STATUS

TABLE 4.2: THE PERCENTAGE DISTRIBUTION OF THE CURRENT USERS ACCORDING TO THE WIFE'S EMPLOYMENT STATUS

A	B	C	D	E
WIFE'S EMPLOYMENT STATUS	NO. OF CASES	NO. OF CURRENT USERS	CURRENT USERS AS PERCENTAGE OF NO. OF CASES	CURRENT USERS AS PERCENTAGE OF TOTAL USERS
Unemployed	3623	294	8.1	71.5
Employed	542	118	21.6	28.5
	4165	412	9.8	100.0

The majority of the current users were unemployed women (71.5 per cent). About 28 per cent of the total current users were employed women. According to table 4.2, 3623 women or 87 per cent of all exposed women (4165) were unemployed and only 542 women or 13 per cent were employed women.

However, women who were employed were more likely to use contraception than their unemployed counterparts; use of contraception increased from a low of 8.1 per cent among unemployed women to 21.6 per cent among employed exposed women. This may be because the employed have greater access to contraceptive services as they can more easily obtain them from public or private clinics than the unemployed exposed women.

This may also be due to the need among the employed to have fewer children to whom they can give better food, clothing, education and other basic needs of life.

Similar results have been found in Panama and Philippines (Mamlouk 1982). However, in Peru women who were employed were found to use contraception at a lower rate than the unemployed women (Mamlouk 1982). She did not explain this unexpected results.

4.0.3. THE PERCENTAGE DISTRIBUTION OF CURRENT USERS ACCORDING TO THE HUSBAND'S EMPLOYMENT STATUS

TABLE 4.3: THE PERCENTAGE DISTRIBUTION OF CURRENT USERS ACCORDING TO THE HUSBAND'S EMPLOYMENT STATUS

A	B	C	D	E
HUSBAND'S EMPLOYMENT STATUS	NO. OF CASES	NO. OF CURRENT USERS	CURRENT USERS AS % OF NO. OF CASES	CURRENT USERS AS % OF TOTAL CURRENT USERS
Unemployed	137	5	3.7	1.20
Employed	4028	407	9.7	98.80
Total	4165	412	9.8	100.0

The majority of the current users (98.8 per cent) were exposed women with employed husbands. Only 1.2 per cent of the current users had unemployed husbands.

According to table 4.3 use of contraception increased with the husband's employment status from a low of 3.7 per cent among women with unemployed husbands to 9.7 per cent among women with employed husbands. Similar positive association between husband's employment status and the wife's contraceptive behaviour has been found to obtain in Indonesia (Freedman et al 1981, Soeradji et al 1982), Thailand and the Commonwealth

Carribbean countries (Clelland et al 1979 Abdulah et al 1984).

4.0.4. THE PERCENTAGE DISTRIBUTION OF CURRENT USERS ACCORDING TO THE NUMBER OF LIVING CHILDREN (FAMILY SIZE)

TABLE 4.4: THE PERCENTAGE DISTRIBUTION OF CURRENT USERS ACCORDING TO THE NUMBER OF LIVING CHILDREN (FAMILY SIZE)

A	B	C	D	E
NO. OF LIVING CHILDREN	NO. OF CASES	NO. OF CURRENT USERS	CURRENT USERS AS % OF NO. OF CASES..	CURRENT USERS AS % OF TOTAL USERS
0	347	5	1.4	1.2
1-3	1657	141	8.4	34.2
4-6	1404	168	12.0	40.8
7+	737	98	13.3	23.8
TOTAL	4165	412	9.8	100.0

Table 4.4 depicts that the majority of current users (41 per cent) had between 4 and 6 living children. The least number (1.2 per cent) of users of contraception were exposed women with no living child.

However, contraceptive use increased with increase in the number of living children.

According to table 4.4 contraceptive use increased from a low of 1.4 per cent among exposed women with no living child to 13.3 per cent among those with at least seven living children.

This finding is not unique. Several scholars have found similar results (Dierdre 1979, Freedman et al 1981, Soeradji et al 1984, Abdulah et al 1984).

This finding does not lend support to Mamlouk's (1982) observation that contraceptive use in the Republic of Korea, Thailand, Colombia and the Dominican republic tended to decline rather than to increase with increase in the number of living children.

4.0.5. THE PERCENTAGE DISTRIBUTION ON THE CURRENT USERS ACCORDING TO CHILDHOOD MORTALITY

TABLE 4.5: THE PERCENTAGE DISTRIBUTION OF THE CURRENT USERS ACCORDING TO CHILDHOOD MORTALITY

A	B	C	D	E
NO. OF CHILDREN DEAD	NUMBER OF CASES	NUMBER OF CURRENT USERS	CURRENT USERS AS PERCENTAGE OF TOTAL NO. OF CASES	CURRENT USERS AS PERCENTAGE OF TOTAL CURRENT USERS
0	2623	303	11.6	73.5
1	902	65	7.2	15.7
2	402	29	7.2	7.0
3+	238	16	6.3	3.8
Total	4165	412	9.8	100.0

The majority of the current users (73.7 per cent) were women with no child dead. And only 3.6 per cent of the current users were exposed women with at least three children dead.

The use of contraception decreased with increase in the number of child deaths experienced. According to table 4.5, use of contraception dropped from a high of 11.6 per cent among women with no child dead to 6.3 per cent among exposed women with at least three children dead.

4.0.6. THE PERCENTAGE DISTRIBUTION OF CURRENT USERS ACCORDING TO THE TYPE OF PLACE OF RESIDENCE

TABLE 4.6: THE PERCENTAGE DISTRIBUTION OF CURRENT USERS ACCORDING TO THE TYPE OF PLACE OF RESIDENCE

A	B	C	D	E
TYPE OF PLACE OF RESIDENCE	NUMBER OF CASES	NO. OF CURRENT USERS	CURRENT USERS AS % OF THE NO. OF CASES	CURRENT USERS AS % OF ALL CURRENT USERS
Rural Areas	3362	284	8.4	68.85
Other Urban Areas	322	44	13.7	10.71
Nairobi/ Mombasa	481	84	17.5	20.4

The majority of the current users (68.85 per cent) resided in the countryside (rural areas). About 11 per cent of the current users resided in urban areas other than Nairobi and Mombasa. And 20.4 per cent of all the current users resided in Nairobi and Mombasa.

According to table 4.6, the majority of the exposed women resided in the countryside and the least (322) resided in urban areas other than Nairobi and Mombasa.

Several researchers have found similar differentials in current contraceptive use by type of place of residence elsewhere (Knodel et al 1976, the Bangladesh Fertility Survey 1975-76, Light-bourne 1980, Awad et al 1983).

The existence of such differentials has been attributed to better educational facilities and opportunites obtaining in the urban areas or the tendency of the better educated women to migrate to urban areas; greater exposure to contraceptive information and access to contraceptive services.

Furthermore urban life may also imply greater access to commercial infant food, resulting in curtailment of breastfeeding and substitution of contraception; increased employment opportunities that compete with both breastfeeding and child rearing (Millman 1985). Urban life is also more supportive or permissive of non-traditional behaviours than the rural areas (Millman 1985).

However, in Indonesia rural women have been found to be generally more likely to use contraception than their urban counterparts (Soeradji et al 1982). This unexpected obversation has been attributed to the fact the

focus of the Indonesian family planning programme, for many years, has been the rural population (Soeradji, et al 1982, Indonesia: Family Planning co-ordinating Board, 1984).

4.0.7 THE PERCENTAGE DISTRIBUTION OF CURRENT USERS ACCORDING TO THE DURATION OF BREASTFEEDING

According to Table 4.7 below, the majority of the current users (39.4 per cent or 162 women) were women who had breastfed for not more than one year and the least number of users were those exposed women who had breastfed for at least 25 months. However, the majority of exposed women (52.4 per cent) indicated that they were still breastfeeding, of whom 8.5 per cent were contracepting.

The use of contraception was found to decline from a high of 31.0 per cent among exposed women who breastfed for not more than six months to 13.5 per cent among exposed women who had breastfed for at least 31 months.

NB: 2186 women indicated that they were still breastfeeding. And 6.4 per cent or 140 of them were contracepting. 141 exposed women had breastfed until their children died, of whom 8.5 per cent were contracepting. 239 exposed women indicated that breastfeeding was not applicable to them and none of them was contracepting. Finally, 301 exposed women did not breastfeed and only 28 per cent of them were contracepting.

TABLE 4.7: THE PERCENTAGE OF CURRENT USERS ACCORDING TO DURATION OF BREASTFEEDING

A	B	C	D	E
BREASTFEEDING DURATION	NO. OF CASES	NO. OF USRERS	USERS AS % OF NO. OF CASES	USERS AS % OF ALL EXPOSED WOMEN
0-6 months	203	63	31.0%	15.3%
7-12 months	569	99	17.4%	24.1%
13-18 months	254	40	15.7%	9.7%
19-24 months	212	46	21.7%	11.1%
25-30 months	15	3	20.0%	0.7%
31+ months	37	5	13.5%	1.2%

However, the exposed women who indicated that they had breastfed for 19 - 24 months were found to be more likely to use contraception than those who had breastfed for 7 to 18 months and for the group of exposed women who had breastfed for more than 24 months.

4.0.8 THE PERCENTAGE DISTRIBUTION OF THE CURRENT USERS ACCORDING TO THE NUMBER OF ADDITIONAL CHILDREN WANTED

Table 4.8 depicts that the greatest users of contraception (37.0 per cent) were exposed women who did not want any children. And only 2.9 per cent of the current users

wanted at least seven more children.

TABLE 4.8: THE PERCENTAGE DISTRIBUTION OF CURRENT USERS ACCORDING TO THE NO. OF ADDITIONAL CHILDREN DESIRED

A. NO. OF ADDITIONAL CHILDREN WANTED	B. NO. OF CASES	C. NO. OF USERS	D. USERS AS % OF NO. CASES	E. USERS AS % OF ALL USERS
0	698	153	21.8	37
1-3	1207	128	10.6	31.1
4-6	942	50	5.3	12.1
7+	282	31	11.0	75
Not Decided	957	50	5.2	12
Not stated	79	0	-	-
TOTAL	4165	412	9.8	100.0

Furthermore the use of contraception decreased with the number of additional children desired; the level of current use dropped from a high of 21.8 per cent of amount exposed women who wanted no more additional children to 4.2 per cent among those who wanted at least seven additional children.

However, it should be pointed out that a large number (546 women or 78.2 per cent) of the exposed women who indicated that they did not want any more children were not contracepting. This finding is not unique. A number of researchers have found a large number of non-users among exposed women who want no more children. (U.N. 1979 A).

4.0.9. THE PERCENTAGE DISTRIBUTION OF CURRENT USERS ACCORDING TO THE TRAVEL TIME TO THE NEAREST SOURCE OF CONTRACEPTIVE SERVICES

TABLE 4.9: THE PERCENTAGE OF CURRENT USERS ACCORDING TO THE TRAVEL TIME TO THE NEAREST SOURCE OF CONTRACEPTIVE SERVICES

A	B	C	D	E
TRAVEL TIME	NO. OF CASES	NO. OF USERS	USERS AS % OF NO. OF CASES	USERS AS % OF ALL EXPOSED WOMEN
Less than 15 Minutes	219	52	24.0%	12.7%
15-29 Minutes	404	79	19.6%	19.2%
30-59 Minutes	616	115	18.7%	28.0%
60 + Minutes	2926	165	5.7%	40.2%

According to table 4.9 above, the majority of the current users (40.2 per cent) indicated that they took at least 60 minutes to reach the nearest source of contraceptive services. And the least number of users (12.7 per cent or 52 women) were those who indicated that they took less than 15 minutes to reach the source.

The majority of exposed women (2926 women) indicated that they took at least one hour to reach the nearest source of contraceptive services; while a small number of 219 women indicated that they took less than 15 minutes to reach the source.

The use of contraception, however, decreased with travel time. The percentage of current users dropped from a high of 24.0 per cent among exposed women who indicated that they took less than fifteen minutes to reach the nearest source of contraceptive services to low of 5.7 per cent among those who indicated that they took at least sixty minutes to reach the nearest source of contraception services.

SECTION B

4.1.0. MULTIPLE REGRESSION RESULTS

Since the choice of order in which variables are entered into the regression model has an important bearing on the results and their subsequent interpretation, it was decided that forward stepwise inclusion of the variables was appropriate. In this case the variable which explains the greatest amount of variance in current contraceptive use will be entered first, and then the variable that explains the greatest amount of variance in conjunction with the first will be entered second and so on (Nie et al 1975 pp 345).

The level of significance of 0.01 was chosen and used in the regression analysis.

The continous variables were entered into the analysis in the usual way and the categorical variables such as employment status were included into the regression analysis by means of a set of a dichotomous dummy or indicator variable.

In a bid to diagnose the existence of multi-collinearity, zero-order partial correlation coefficients were computed and

tabulated (see table 4.10). These indicated that the variables selected for this study were not highly correlated. Thus no multi-collinearity existed.

RESULTS

The multiple regression analysis was based on 412 exposed women who were contraceptors as at the time of the interview.

According to the stepwise regression equation results, all the nine variables were significant at 0.01 level. Table 4.11 below shows the summary of the multiple regression equation results.

Travel time to the nearest source of contraceptive services proved to be the major variable determining the current use of contraception.

On being entered into the regression equation as the first variable, it was found to explain 13.8 per cent variance.

TABLE 4.10 ZERO-ORDER PARTIAL CORRELATION COEFFICIENTS BETWEEN CONTRACEPTIVE USE (CONUS) AND THE SELECTED INDEPENDENT VARIABLES

VARIABLE	CONUS	WEDUC	WOCC	HOCC	NLC	CMORT	PLACE	BREAST	TRAVT	NACD
WEDUC	0.2169	1.00								
WOCC	0.1826	0.5528	1.00							
HOCC	0.0411	0.0048	0.0131	1.00						
NLC	0.0205	-0.3411	-0.1473	0.0917	1.00					
CMORT	-0.0977	-0.2936	-0.1949	-0.0466	-0.0342	1.00				
PLACE	0.2206	0.5057	0.4030	0.0539	-0.2664	-0.1041	1.00			
BREAST	-0.2135	-0.0502	-0.2095	-0.0005	-0.2002	0.0509	-0.1254	1.00		
TRAVT	-0.3721	-0.2715	-0.1813	-0.0340	-0.0038	0.1018	-0.1789	0.1010	1.00	
NACD	-0.1439	-0.0299	-0.0246	0.0486	0.1184	-0.2920	-0.0162	-0.0066	0.0228	1.00

TABLE 4.1.1 COEFFICIENTS OF DETERMINATION (R^2) AND STANDARDIZED PARTIAL REGRESSION COEFFICIENTS (BETAS) FOR THE SELECTED EXPLANATORY VARIABLES AFFECTING CURRENT USE OF CONTRACEPTION AMONG WOMEN EXPOSED TO THE RISK OF PREGNANCY

VARIABLES	R	R^2	r	BETA
TRAVT: Travel Time to FP Services	0.3721	0.13845	-0.3721	-0.30882
BREAST: Duration of Breastfeeding	0.4112	0.16972	-0.2135	-0.14811
PLACE: Type of Place of Residence	0.4345	0.18877	0.2207	0.11960
NACD : No. of Add. Children Desired	0.4550	0.20704	-0.14396	-0.14178
WEDUC: Wife's Education	0.4582	0.20993	0.2169	0.0947
NLC: Family Size	0.4623	0.21375	0.0205	0.06593
CMORT: Children Mortality	0.4633	0.21461	-0.0977	-0.03007
HOCC: Husband's Employment Status	0.4636	0.21469	0.04114	0.00934
WOCC: Wife's Employment Status	0.4639	0.21475	0.1826	0.0092

No. of Cases = 412

Error (e) = 2.46

The inclusion of the duration of breastfeeding variable raised the amount of explained variance in current use of contraception to 16.97 per cent (F = 41.801, SL = 0.01). Hence the duration of breast-feeding was the second most important variable determining the use of contraception.

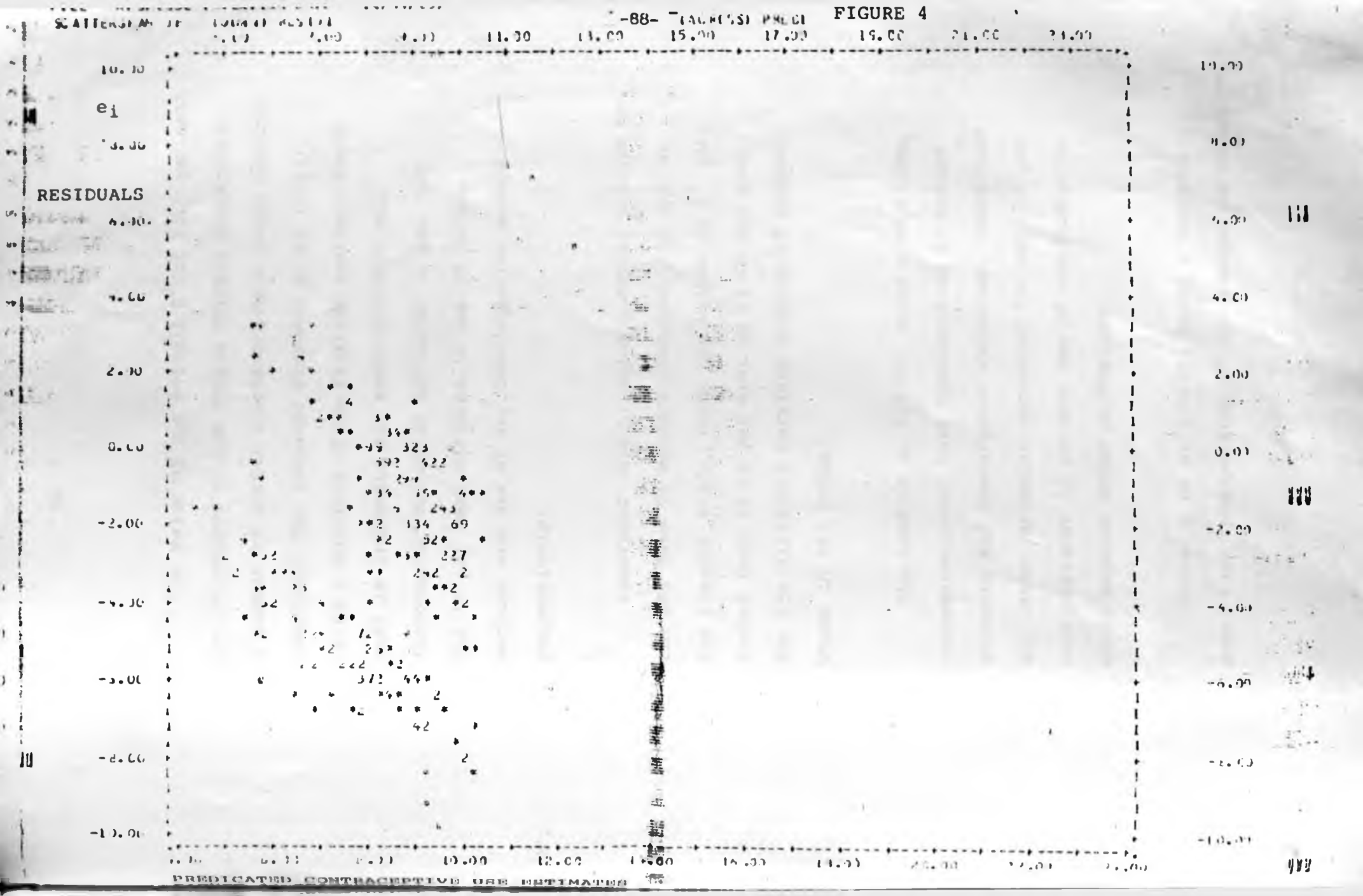
On entering the type of place of residence, represented by the urban category, the amount of explained variance was raised to 18.88 per cent (F = 31.64 SL= 0.01)

The inclusion of the number of additional children desired, raised the amount of explained variance to 20.7 per cent (F = 26.566, SL = 0.01).

And the inclusion of the rest of the variables raised the value of the overall R^2 to 21.5 (F = 12.215, SL = 0.01).

An analysis of the residuals was carried out in an attempt to diagnose any abnormalities in the data with regard to the assumptions underlying the regression model. A plot of the p residuals against the predicted variable (r) i.e. contraceptive use (scores) was computed and no clear pattern was indicated. (See figure 4. computer sheet).

FIGURE 4



The value of the overall R^2 of 21.5 per cent is not unique in the social science researches. A number of social scientists have found similar results. For instance Freedman et al (1981), using a multiple classification analysis found that in Indonesia six socio-economic and demographic variables explained 15 per cent and 18 per cent variance in use of modern methods and use of any contraceptive method respectively.

Immerwahr (1981), using a method similar to the one used to measure contraceptive use in the present study, found the values of R^2 that ranged from 10.24 per cent to 19.02 per cent for the different marriage cohorts of exposed women in Sri Lanka.

Clelland et al (1979), using a multiple regression model that incorporated 23 socio-economic and demographic variables, found that all these variables accounted for only 15 per cent variance in current use of contraception among exposed women in Thailand.

Soeradji et al (1982), using a regression model that incorporated 10 socio-economic variables

found that all these variables accounted for only 17.2 per cent variance in current use of contraception among exposed women in Java-Bali region in Indonesia.

However, it should be noted that the regression model may have been subject to specification error arising partly from the omission of certain variables and partly from measurement problems.

With regard to the ommitted variables, some of the variables which the author suspects to be strongly related to the use of contraception were absent in the study because they were not incorporated in the Kenya Fertility Survey questionnaire. These variables include the perceived and actual monetary, physiological and psychic costs of contraception.

As for the measurement problem, some of the variables were not clearly defined in the Kenya Fertility Survey questionnaire nor were some of them properly coded in the Kenya Fertility Survey Raw-data-Tape. For instance, employment (work) was not clearly defined as it referred to the most recent work done after getting married. This applied to both the wife's and husband's employment status.

Furthermore in the Kenya Fertility

Survey - Raw-data Tape the classification of occupation does not (except for the agricultural category) indicate whether or not the respondent or the respondent's husband worked for pay, salary or was self employed.

In the following paragraphs an attempt is made to investigate the relationship between each of the selected explanatory variables and contraceptive use.

4.1.1. THE RELATIONSHIP BETWEEN TRAVEL TIME TO THE SOURCE OF CONTRACEPTIVE SERVICES AND CONTRACEPTIVE USE

As was hypothesized travel time to the nearest source of contraceptive services was found to be inversely related to contraceptive use. The correlation coefficient between the two variables was found to be r= - 0.3721.

Travel time was found to be the major determinant of the use of contraception. It explained the greatest amount of variance (13.8 per cent) in current use of contraception.

The mean travelling time was found to be 68, 40 and 30 minutes for the rural, urban

and Nairobi - Mombasa residents.

Therefore this information confirms our hypothesis regarding the relationship between travel time to the nearest source of contraceptive services and contraceptive use.

A number of past studies have shown similar association between travel time to the nearest source of contraceptive services and use of contraceptives (Chen et al 1983), Novak et al (1983), Tsui et al (1981).

4.1.2. THE RELATIONSHIP BETWEEN THE DURATION OF BREASTFEEDING AND CONTRACEPTIVE USE

The relationship between the duration of breastfeeding and use of contraception was found to be inversely. The correlation coefficient between the two variables was found to be r=-0.2135. Duration of breastfeeding explained 3.2 per cent variance in current use of contraception among the exposed women.

The mean duration of breastfeeding for women in the rural areas was found to be 14 months while those in urban areas breastfed for average of

10 months.

The inverse relationship between the two variables have been found to obtain elsewhere (Millman 1985, Zuryak 1981, Bonghaarts et al 1981).

The inverse relationship between breastfeeding and contraception means that women are substituting contraception for breastfeeding as a means of fertility regulation. This is particularly the case with urban educated working women who have little time to breastfeed their children, resulting in increased use of commercial infant food and substitution of contraception for breastfeeding.

And among other women especially rural dwellers this inverse relationship between breastfeeding and contraception may be partly due to the belief that breastfeeding is a contraceptive method since it delays the return of ovulation after birth as it postpones the return of menstruation.

The inverse relationship between the duration of breastfeeding and contraceptive use

confirms the hypothesis that duration of breastfeeding is inversely related to contraceptive use.

4.1.3. THE RELATIONSHIP BETWEEN THE TYPE OF PLACE OF RESIDENCE AND CONTRACEPTIVE USE

A positive relationship was found to obtain between the type of current residence represented by the urban category and contraceptive use. The correlation coefficient between the two variables was found to be r= 0.2206 and type of place of residence explained 1.91 per cent variance in current use of contraception.

The low association between the two variables may be due to the high concentration of the exposed women in rural areas. Table 4.6 in section A of this chapter indicated that 3362 women or 69 per cent of the current users resided in the rural areas. Similar results have been found in Indonesia (Soeradji et al 1982).

This information confirms the hypothesis that the type of place of residence affects contraceptive use; with the urban women being more likely to use contraception than their

rural counterparts.

These differentials in contraceptive use may be due to the fact that women residing in urban areas are more exposed to contraceptive information and have greater access to contraceptive services than the rural women. The women residing in the rural areas take on average 68 minutes to reach the nearest source of contraceptive supplies and/or advice while those living in urban and Nairobi - Mombasa take, on average 40 and 30 minutes respectively.

Urban women have greater access to commercial infant foods resulting in curtailment of breast-feeding and substitution of contraception for breastfeeding. Urban women have also greater opportunities for outside activities (eg: employment (work) that compete with breastfeeding and child bearing and rearing. Urban women breastfeed their children for an average of 10 months while women in the rural areas breastfeed for about 14 months.

4.1.4. THE RELATIONSHIP BETWEEN THE NUMBER OF ADDITIONAL CHILDREN WANTED AND CONTRACEPTIVE USE

An inverse association was found to obtain between the number of additional children wanted

and the current use of contraception. The correlation coefficient between the number of additional children and contraceptive use was found to be r= - 0.1439 and this variable was found to explain 1.83 per cent variance in current use of contraception. This low association and hence effect may be due to the fact that the majority (37 per cent) of the current users desired between 0 and 3 additional children.

This information together with the information presented in table 4.8 of section A of this chapter confirms the hypothesis that the number of additional children desired is inversely related to use contraception.

However, it must be pointed out that in Kenya contraception is most likely to be used as a spacing mechanism than for stopping bearing children. This observation is based on two factors. First, the use of contraception begins early in the life cycle, when the intension is to space birth (see table 4.4). Second, about 8 per cent of exposed women who wanted at least one additional child were contracepting (see table 4.8).

4.1.5. THE RELATIONSHIP BETWEEN THE WIFE'S EDUCATION AND CONTRACEPTIVE USE

As was hypothesized the wife's education was found to be positively related to contraceptive use. The correlation coefficient between the two variables was found to be r= 0.2169 wife's education explained 0.3 per cent variance in current use of contraception.

This low association between the two variables may be due to the high concentration of the current users in the lower education strata; 81.5 per cent of the current users had between 0 and 8 years of schooling (i.e. in the no education and primary education strata).

This information with the information presented in table 4.0.1. of section A of this chapter, confirms the hypothesis that the wife's education is positively related to contraceptive use.

The low association between the wife's education and the use of contraception has been found elsewhere (Soeradji et al (1982), Abdulah et al 1984 Freedman et al 1981,

Clelland et al 1979).

4.1.6. THE RELATIONSHIP BETWEEN THE CHILDHOOD MORTALITY AND CONTRACEPTIVE USE

An inverse relationship was found to obtain between the childhood mortality experience and the use of contraception. The correlation coefficient between the two variables was found to be r= -0.0977 and childhood mortality explains 0.09 per cent variance in current use of contraception.

The low association between the two variables may be due to the contaminating effect arising from the measuring error. This variable measures the total childhood mortality experience rather than childhood mortality experience during the open birth interval.

However, this information confirms the hypothesis that childhood mortality experience is inversely related to contraceptive use.

The inverse relationship between the two variables may be due to the desire among exposed women with high childhood mortality experience to have enough children to replace the

dead children or/and to ensure against future child mortality.

The above finding on the relationship between childhood and use of contraception does not lend support to Scrimshaw's argument that high childhood mortality may signal the readiness to initiate vigorous family planning effort rather than the opposite (Scrimshaw 1979).

4.1.7. THE RELATIONSHIP BETWEEN THE WIFE'S EMPLOYMENT STATUS AND CONTRACEPTIVE USE

The wife's employment status was found to be positively related to contraceptive use ($r = 0.1826$) and it explained 0.01 per cent variance in current use of contraception.

This low association may be partly due to the high concentration of women (72 per cent) in the unemployed category. And partly due to the measurement problems referred to earlier in section A of this chapter. This information together with the information presented in table 4.2 of section A of this chapter confirms the hypothesis that wife's employment status is positively related to

contraceptive use.

In Chapter Two, a citation was made of a study done by Mamlouk in 1982 which indicated that in Peru women who worked used contraceptives at the rate of 20 per cent lower than those women who did not work. The findings from this study are not in conformity with that finding.

This may be due to the fact that the Kenya working women have greater motivation to use contraceptives, than the non-working women, while in Peru the non-working women have greater motivation use contraceptives than the working women.

4.1.8 THE RELATIONSHIP BETWEEN THE HUSBAND'S EMPLOYMENT STATUS AND CONTRACEPTIVE USE

Husband's employment status, a variable which the author thought would feature as one of the major determinants of contraceptive use, was found to be weakly associated with the current use of contraception. The correlation coefficient between the two variables was found to be r = 0.0411 and it explained 0.01 per cent variance in current use of contraception. It was the last variable to be entered into the multiple regression equation.

This means that there is little linear dependence of contraceptive use upon the husband's employment status. Like the wife's employment status variable, this variable had measurement problems and perhaps these measurement problems were responsible for this low association between the husband's employment status and contraceptive use.

However, this information does confirm the hypothesis that a positive relationship exists between the husband's employment status and contraceptive use.

4.1.9. THE RELATIONSHIP BETWEEN FAMILY SIZE AND CONTRACEPTIVE USE

Family size was found to be positively related to contraceptive use. The correlation coefficient was found to be r= 0.0205 and it (family size) explained about 0.5 per cent variance in current use of contraception.

The low association between family size and contraceptive use may be due to the fact that the majority of the current users (70per cent) had between one and six living children. According to table 4.4 of section A

of this chapter only 23 per cent of the current users had at least seven living children.

As the number of living children increases, the cost of rearing them (children) increases. Also as the number of the living children increases, some families attain their desired family sizes, hence increased use of contraception for stopping child bearing.

This information does confirm the hypothesis that family size is positively related to contraceptive use.

C H A P T E R F I V E

5.0.0. SUMMARY, CONCLUSION AND RECOMMENDATIONS

This chapter deals with the summary of the findings, conclusion and recommendations.

In a bid to avoid unnecessary repetitions a summary of the findings is presented with reference to the hypotheses stipulated in chapter one.

5.0.1. A SUMMARY OF THE FINDINGS

The stepwise (Multiple) regression analysis indicated that the selected nine explanatory variables explained 21.5 per cent variance in current use of contraception and that they were statistically significant at 0.01 level.

The overall value of R^2 of 21.5 per cent is not unique in social sciences. Similar results have been found elsewhere (Clelland et al 1979, Soeradji et al 1982, Immerwahr 1981, Freedman et al 1981, Abdulah et al 1984).

In the following paragraphs an attempt is made to present together the results of the crosstabulations and the regression analysis.

Although the majority (81.31 per cent) of the users were exposed women with no education or primary education, education was found to be positively related to contraceptive use. The level of contraceptive use increased from a low of 5.7 per cent among exposed women with no education to a high of 37.5 per cent among exposed women with University education.

Furthermore the regression analysis results indicated a positive relationship (r= 0.2169) between the wife's education and the use of contraception and that education explained 0.3 per cent variance in the current use of contraception.

This information confirms the hypothesis that the wife's education is positively related to contraceptive use.

As was hypothesized the wife's employment status was found to be positively related to contraceptive use. The level of contraceptive use rose from a low of 8.1 per cent among the

unemployed exposed women to a high of 21.6 per cent among the employed exposed women.

However, the majority (71.5 per cent) of the current users were unemployed.

The regression analysis results further confirmed the existence of a positive relationship between the wife's employment status and contraceptive use. The correlation coefficient between the two variables was found to be r= 0.1826 and that the wife's employment status explained 0.01 per cent variance in current use of contraception. The low association may be partly due to the high concentration of women (72 per cent) in the unemployment category. And may also be due to the measurement problems referred to earlier.

The majority (98.8 per cent) of the current users were found to be women with employed husbands. Contraceptive use was found to be positively related to the husband's employment status. The level of contraceptive use rose from a low of 3.7 per cent among women with unemployed husbands to a high of 9.7 per cent among women with employed husbands.

Furthermore the regression analysis indicated a positive relationship (r= 0.04114) between the husband's employment status and the contraceptive use and that the husband employment status explained 0.01 per cent variance in current use of contraception.-

As was hypothesized family size was found to be positively related to contraceptive use. The level of contraceptive use rose from a low of 1.4 per cent among women with no living children to a high of 13.3 per cent among women with at least seven living children. However, the majority (70 per cent) of the contraceptors had between one and six living children.

Furthermore the regression analysis results indicated that a positive relationship existed between family size and contraceptive use. The correlation coefficient was found to be r= 0.0205 and family size was found to explain 0.5 per cent variance in current contraceptive use. The low association between these two variables may be due to the fact that the majority of the contraceptors had between one and six living children and that only 23 per cent of the current users had at least seven children.

Urban women were found to be more likely to use contraception than their rural counters. The level of contraceptive use from a low of 8.4 per cent among the rural women to 13.7 per cent among women residing in urban areas other than Nairobi and Mombasa to a high of 17.5 per cent among Nairobi and Mombasa women.

In addition, the regression analysis results indicated a positive relationship existed between the type of place of current residence and contraceptive use. The correlation coefficient was found to be r = 0.2207 and the type of place of residence was found to explain 1.91 per cent variance in current use of contraception.

As was hypothesized, the number of additional children desired was found to be inversely related to contraceptive use. The level of contraceptive use dropped from a high of 21.8 per cent among exposed women who desired no more children to a low or 4.2 per cent among exposed women who desired no more children to a low or 4.2 per cent among women who desired at least seven

additional children. Furthermore the greatest users (68.1 per cent) desired not more than three additional children.

However, a large number (78.2 per cent) of women who indicated that they did not want any more children were not contracepting. Unfortunately, they were not asked for reasons for not contracepting.

An inverse association was found to exist between child mortality and contraceptive use. The level of contraceptive use dropped from a high of 11.6 per cent among women with no child dead to a low of 6.3 per cent among women with at least three children dead. Furthermore the majority (73.7 per cent of the contraceptors had no child dead and only 3.6 per cent of the contraceptors current users had at least three children dead.

The regression analysis results further confirmed the inverse relationship between child mortality and contraceptive use. The correlation coefficient between the two variables was found to be $r=-0.0977$ and child mortality explained 0.09 per cent variance in current

contraceptive use.

As was hypothesized travel time to the nearest source of contraceptive services was found to be inversely related to contraceptive use. The level of contraceptive use dropped from a high of 24.0 per cent among exposed women who took less than fifteen minutes to reach the nearest source of contraceptive services to a low of 5.7 per cent among those who indicated that they took at least sixty minutes to the nearest source of contraceptive services.

The regression analysis further confirmed the inverse relationship between travel time and contraceptive use. The correlation coefficient between the two variables was found to be $r = -0.3721$. Travel time explained the greatest amount of variance (13.8 per cent) in current use of contraceptives.

The relationship between the duration of breastfeeding and the use of contraceptives was found to be inverse. The correlation coefficient between the two variables was found to be $r = -0.2135$. Duration of breastfeeding explained 3.2% variance in current use of contraceptives among the exposed women.

5.2 CONCLUSION

All the explanatory variables selected for this study were found to account for only 21.5 per cent variance in current use of contraception among the sub-population of exposed women including the contraceptively sterilized women drawn from the entire country.

All the hypotheses stipulated in chapter one have been confirmed.

Travel time to the nearest source of contraceptive services was found to be the most important determinant of contraception as it explained 13.8 per cent variance in current use of contraception.

The second important determinant was found to be the duration of breastfeeding. It explained 3.2 per cent variance. The third important determinant was found to be the type of place of current residence. It explained 1.92 per cent variance in the current use of contraception and the least important determinant was found to be of

husband's and wife's employment status variables for each explained 0.01 per cent variance in current use of contraception.

As was pointed out in Chapter 4 that the low overall, R^2, value found in this study is not unique. Similar results have been found in Thailand, Indonesia, Sri Lanka, Commonwealth Carribean countries and Pennisular Malaysia (Immerwahr 1981, Soeradji et al 1982, Freeman et al 1981, Abdulah et al 1984).

The cross-tabulation and multiple regression analysis were used as methods of data analysis. The cross-tabulation was used basically because of its simplicity and appropriateness for comparative purposes whereas regression analysis was used due to its capability to disentangle both absolute and relative effects of the exgenous variables upon a dependent variable. A logit model would have been more appropriate for this kind of study but due to the unavailability of logit computer program they were not utilized.

However, in order to make use of the linear multiple regression analysis an index of contraceptive use based on the empirical findings on

the use - effectiveness of each contraceptive method had to be constructed. This was done basically to create a continous dependent variable.

Finally it should be pointed out that the regression model used may have suffered from the specification error arising from both the missing variables and the measurement errors especially of the wife's and husband's employment status variables.

5.3. RECOMMENDATIONS

In order to raise the level of contraceptive use in the country, the following measures have been suggested:

Contraceptive service should be made more accessible to the majority of potential and actual users so as to reduce the perceived and actual opportunity cost of obtaining contraceptives and the related services.

Since the cost required to expand the currently clinic based contraceptive delivery system is prohibitively expensive, non-clinical delivery systems such as community based

contraceptive distribution (CBD) and commercial distribution systems can reduce considerably the service delivery costs. They can also alleviate some of the constraints confronting potential and actual users of contraception under the current clinic based distribution system (e.g. barriers such as distance, various forms of costs, administrative bottlenecks e.g. long waiting lines).

These service delivery systems can be used for distributing contraceptives such as orals, condoms, foaming tablets with referrals to clinics for IUD, injectables, sterilization and other surgical contraception.

Since child mortality is inversely related to contraceptive use a considerable reduction in child mortality is bound to bring about an increase in the level of contraceptive use. Therefore concerted efforts should be made to reduce infant and child mortality throughout the country.

Breastfeeding mothers should be encouraged to use appropriate contraceptives. This is basically to compliment the "contraceptive effects" of breastfeeding. This study has

revealed that contraception and breastfeeding are used as substitute means of fertility regulation.

Population education should be introduced in the formal education curriculum to create favourable attitudes toward family planning and responsible parenthood. At the same time efforts should be made to improve the educational levels of the majority of the women. Currently the majority of the women are concentrated in the lower educational strata and this partly explains why the wife's education explained relatively little variance in current use of contraception.

Concerted efforts should be made to improve the socio-economic status of women especially their participation in paid employment. Their active participation in paid employment is likely to create radical changes in their life styles, consumption patterns and reproductive behaviour, thereby creating favourable attitudes towards family planning and contraceptive use.

Although type of place of current residence was found to be positively related to

contraceptive use, it is not advisable to advocate for increased urbanization as a policy for increasing the level of contraceptive use. Increased urbanisation will accelerate rural-urban migration and thereby worsening the urban unemployment and provision of basic services and facilities in urban areas and retards socio-economic development in the areas of origin.

Concerted efforts should be made to make contraceptive services available throughout the country. And the people, especially those residing in the rural areas, should be informed and educated on the socio-economic implications of high population growth rate to the welfare of an individual family and the nation as a whole.

Last but not least, the general standards of living for the majority of the population should be raised as these conditions are conducive to increased contraceptive use and reduced fertility.

As regards further research, a similar study should be carried out at various levels of the society. In future research undertaking, efforts should be made to incorporate perceived and

actual socio-psychological and health costs of contraception and family planning programme specific variables such as the communication styles, and the effectiveness of the personnel, etc.

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APPENDIX I

A SUMMARY OF STEPWISE MULTIPLE REGRESSION EQUATION RESULTS

VARIABLE	R	R^2	B	BETA	F	VARIABLES NOT IN EQUATION	BETA IN	PARTIAL	TOLERANCE
STEP I									
TAVT	0.37208	0.13845	0.00029	-0.37208	65.884				
						NLC	0.02195	0.02364	0.99999
STANDARD ERR (e)=2.529						BREAST	-0.17775	-0.19052	0.98978
STANDARD ERROR B = 0.00004						NACD	-0.13543	-0.14587	0.99948
						WEDUC	0.12516	0.12977	0.92629
						HOCC	0.02854	0.03073	0.99885
						WOCC	0.11904	0.12612	0.96713
						PLACE	0.15914	0.16870	0.96796
						CMORT	-0.06047	-0.06481	0.98963
STEP 2				.e=2 .486					
BREAST	0.41197	0.16972			41.8				
VARIABLES IN EQUATION		(ST.E.B)	B	(BETA)	(F)	NLC	-0.01428	-0.01535	0.95935
						NACD	-0.13703	-015034	0.99940
TRAVT		0.00004	0.00028	0.35412	61.144	WEDUC	0.13703	-0.15034	0.92577
BREAST		0.00291	0.01142	-0.17775	15.404	HOCC	0.02906	0.03187	0.99884
						WOCC	0.08723	0.09233	0.93020
						PLACE	0.14115	0.15149	0.95634
						CMORT	-0.05327	-0.05810	0.98796

NB:
ST.E.B = STANDARD ERROR B

STEP 3	(R)	(R^2)		F
PLACE	0.43448	0.18877	e=2.460	31.65

VARIABLES IN EQUATION

	(ST.E.B)	(B)	(BETA)	(F)
TRAVT	0.00004	-0.00026	-0.33041	52.8
BREAST	0.00290	-0.01044	-0.16244	12.9
PLACE	0.26784	0.82913	0.14115	9.583

VARIABLES NOT IN EQUATION

VARIABLES	BETA IN	PARTIAL	TOLERANCE
NLC	0.03078	0.03193	0.87294
NACD	-0.13520	-0.15005	0.99922
WEDUC	0.06722	0.06287	0.70960
HOCC	0.02231	0.02472	0.99642
WOCC	0.03959	0.03937	0.80221
CMORT	-0.04192	-0.04610	0.98102

STEP 4	(R)	(R^2)	e=2.435	F
NACD	0.45501	0.20704		26.56

VARIABLES IN EQUATION

	(ST.E.B)	(B)	(BETA	(F)
TRAVT	0.0004	-0.00026	-0.32751	52.923
BREAST	0.00287	-0.00964	-0.16386	13.475
PLACE	0.26516	0.81830	0.13930	9.523
NACD	0.00350	-0.01070	-0.13520	9.375

NLC	0.04894	0.05097	0.86025
WEDUC	0.06387	0.06041	0.70928
HOCC	0.01595	0.01786	0.99419
WOCC	0.03667	0.03688	0.80191
CMORT	-0.04642	-0.05161	0.97998

STEP 5	(R)	(R^2)	e=2.434	(F)
WEDUC	0.45818	0.20993		21.57

VARIABLES IN EQUATION

	(ST.E.B)	(B)	(BETA)	(F)
TRAVT	0.00004	-0.000253	-0.31545	46.886
BREAST	0.00287	-0.01064	-0.16567	13.776
PLACE	0.30266	0.63996	0.10895	4.471
NACD	0.00349	-0.010615	-0.13407	9.226
WEDUC	0.03505	0.04274	0.06387	1.487

NLC	0.06904	0.06949	0.80040
HOCC	0.01778	0.01993	0.99308
WOCC	0.01265	0.01144	0.64604
CMORT	-0.03416	-0.03661	0.90742

STEP 6	(R)	(R^2)			
NLC	0.46233	0.21375		e=2.43116	18.35

VARIABLES IN EQUATION

(VARIABLE	(R)	(ST.E.B.)	(B)	(BETA)	(F)
TRAVT		0.00004	-0.000249	-0.30968	44.937
BREAST		0.00295	-0.00964	-0.15008	10.668
PLACE		0.30587	0.7052505	0.12006	5.319
NACD		0.00352	0.011203	-0.14150	10.154
WEDUC		0.03629	0.056163	0.0839	2.395
NLC		0.05681	0.07965	0.06904	1.965

VARIABLES NOT IN EQUATION

VARIABLES	BETA IN	PARTIAL	TOLERANCE
HOCC	0.01069	0.01193	0.97956
WOCC	0.01069	0.00968	0.64562
CMORT	-0.03085	-0.03309	0.90492

STEP 7	0.46326	0.21461		e=2.4328	
CMORT					

VARIABLES IN EQUATION

	(ST.E.B.)	(B)	(BETA)	(F)
TRAVT	0.00004	-0.000248	-0.30910	44.690
BREAST	0.00295	-0.00958	-0.14922	10.523
PLACE	0.30647	0.715644	0.12183	5.453
NACD	0.00352	-0.0112809	-0.14248	10.270
WEDUC	0.03779	0-049226	0.07356	1.697
NLC	0.05693	0.07765	0.06732	1.861
CMORT	0.14453	-0.096186	-0.03085	0.443

HOCC	0.00933	0.01040	0.97743
WOCC	0.00918	0.00832	0.64449

STEP 8	(R)	(R^2)	B	e=2.435	(F)
HOCC	0.46335	0.21469			13.770

VARIABLES NOT IN EQUATION

VARIABLES	(BETA IN)	(PARTIAL)	TOLERANCE
WOCC	0.00921	0.00834	0.64449

VARIABLES IN EQUATION

(VARIABLES)		(B)	(BETA)	(F)
TRAVT	0.00004	-0.000248	-0.30891	44.511
BREAST	0.00296	-0.00961	-0.14959	10.535
PLACE	0.30779	0.71054	0.12097	5.330
NACD	0.00353	-0.011274	-0.14189	10.120
WEDUC	0.03783	0.04934	0.07373	1.701
NLC	0.05737	0.07630	0.06613	1.768
CMORT	0.14487	-0.09478	-0.03039	0.428
HOCC	0.72179	0.15077	0.00933	0.044

STEP 9			e=2.438	
WOCC	0.46341	0.21475		12.215

VARIABLES IN EQUATION

	(ST.E.B.)	(B)	(BETA)	(F)
TRAVT	0.00004	-0.000248	-0.30882	44.376
BREAST	0.00302	-0.009514	-0.14811	9.938
PLACE	0.31189	0.702549	0.11960	5.074
NACD	0.00354	-0.011224	-0.14178	10.077
WEDUC	0.04155	0.046484	0.06947	1.251
NLC	0.05740	0.0760617	0.06593	1.752
CMORT	0.14516	-0.093762	-0.03007	0.417
HOCC	0.72267	0.1510332	0.00934	0.044
WOCC	0.33189	0.055496	0.00921	0.028

PENDIX
GURE 1

A MAP OF THE REPUBLIC OF KENYA
SHOWING AREAS COVERED BY KFS