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KNOWLEDGE, AVAILABILITY AND USE OF CONTRACEPTIVES
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BY

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A thesis submitted in partial fulfillment
of the requirements for the degree of
Master of Arts (Population Studies)
in the University of Nairobi.

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DECLARATION

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

Mungai

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This thesis has been submitted for examination with our approval as the university supervisors.

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4/11/86

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ABSTRACT

KNOWLEDGE, AVAILABILITY AND USE OF CONTRACEPTIVES IN KENYA.

This thesis examines the effects of socio-economic, demographic and social setting factors on availability, accessibility and use of contraceptives by currently married fecund non-pregnant women aged 15-49 years in Kenya.

It utilizes path analysis and multiple regression to test a series of recursive models that are hypothesized to explain the variation in the dependent variable in question.

The findings indicate that there are differentials in knowledge of a family planning outlet for those women who are currently using inefficient methods of contraception. This knowledge is shown to be highly depressed by the time a woman reports it would take her to reach a family planning outlet.

The study demonstrates the strong positive effect of knowledge of a family planning outlet on current use of efficient methods of contraceptives. It also shows the strong negative effect of travel time to source on knowledge of a family planning outlet and its negative effect on current use of contraceptives.

The study shows that the perceptions of non-users of efficient methods are realistic as they bear close affinity to findings of those currently using efficient contraceptive methods.

The study concludes that the interrelationship between the background factors, availability, accessibility and use of contraceptives bears close resemblance to other findings of similar studies carried out in other developing countries. It also concludes that the mode of transport, education and number of living children are important factors for policy use to influence knowledge of a family planning outlet and use of efficient methods of contraceptives.

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LIST OF ABBREVIATIONS

Abbreviation	Full Name
E A	Enumerated Area.
FPAK	Family Planning Association of Kenya.
KCBS	Kenya Central Bureau of Statistics.
KCPS	Kenya Contraceptive Prevalence Survey.
NASSEP	National Sample Survey and Evaluation Programme.
NCPD	National Council for Population and Development.
OLS	Ordinary Least Squares.
PSU	Primary Sampling Unit.
PSO	Provincial Statistical Officer.
SDP	Service Delivery Points.
SPSS	Statistical Package for Social Scientist.
WHS	Westinghouse Health System
WFS	World Fertility Survey

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CHAPTER ONE

GENERAL INTRODUCTION

1.1 Introduction

Kenya's annual rate of population increase is estimated to lie between 3.9 and 4.1 per cent, one of the highest growth rates in the world (Ominde, 1983 p.3; Population Newsletter 1985, p.8).

At the first census in 1948, the population of Kenya stood at 5.4 million with an estimated annual growth rate of 2.3 per cent. It was then doubling in just under 30 years. Fourteen years later, in 1962, it had increased to 8.6 million and the annual rate of growth was 3 per cent. The doubling time had been reduced to 23 years. By the time the next census came around in 1969, the doubling time for a population of 10.9 million had been reduced to 21 years. The most recent census of 1979, recorded a total population of 15.3 million which was estimated to have a growth rate of 3.85 per cent per annum, implying a doubling time of just under 20 years (Ominde, 1984, p.53).

As a result of this trend of population growth, the total fertility rate, defined as the average number of children that a woman who has completed her reproductive life has given birth to, rose from 6.8 in 1962 to 7.2 in 1969 and 8.1 in 1979 suggesting a rise in fertility of about 18 per cent (Henin, 1979, p.7). The major reasons for this fertility gain are the decline in the incidence of childlessness of Kenyan

women between the ages of 15-49 and also foetal loss as a result of improvement in nutrition and health status.

During the last thirty years, while the crude birth rate has shown an upward trend, the crude death rate has maintained a downward trend and was estimated to stand at 14 deaths per thousand population in 1979. Of particular interest is the infant mortality rate which stands at 87 per thousand live births, making Kenya one of the eight countries out of 52 in Africa to have an infant mortality rate below 100 per thousand live births (Nyonyintono, 1985 p.2).

The decline in infant mortality has been consistent for all age groups of the mother. In 1962, the proportion of children dying of mothers aged 15 to 19 was 0.146 and it was as low as .101 by 1977/78. The decline in infant mortality for mothers aged 25 to 29 was 0.205 and 0.144 for 1962 and 1977/78 respectively (Kenya Fertility Survey Report, 1980 p.104).

These two phenomena of declining mortality and rising fertility are manifested in rapid population growth which puts pressure on all areas of social and economic development.

One of the areas where population pressure is felt acutely is in agricultural land. In Kenya, about 3/4 of the total population is concentrated in approximately 1/8 of the land area and more than 80 per cent of the population is rural (Ominde, 1983, p.5). From the 1969 census data, it has been shown that 65 per cent of the total population lived at a density of over 100 persons per square kilometre, 43 per cent

at a density of over 200 persons per square kilometre and 21 per cent at over 400 persons per square kilometre (Ominde, 1983, p.5).

These figures show increasing pressure on land which is manifested in land fragmentation, land degradation through soil erosion, rural to rural migration, leading to settlements in marginal lands (Ominde, 3 p. 10), all of which have contributed to lower agricultural output.

Related to the land problem is the increasing dependency burden. Data from the 1962 census estimated that 46 per cent of the Kenyan population was under the age of 15. The dependency ratio was 106 dependants to every 100 in the gainfully employed population. The revised projection of the percentage population under age 15, from the National Demographic Survey 1977, indicates that the dependency ratio by 1979 was 112. This rose to 122 by 1984 and is expected to reach 128 by the 1988 (Ominde, 1984 p.53). At the family level this young population will place more demands on mothers who will be caring for more children spaced closer together and most of the family resources will be invested in the care of the youth.

At the national level this population reduces the country's capacity to save and invest as a greater proportion of nation's output tends to be devoted to the consumption needs of a youthful population, especially in the provision of education and health facilities, while each year larger numbers

than ever before enter both the reproductive age as well as the working age bracket, but the employment targets tend to emphasize production that is hardly related to the projection of the labour force.

The need to manage the rapid population growth was felt early in Kenya and different strategies have been developed towards this end. Family planning activities started as early as 1952 under voluntary non-governmental organizations which culminated into the formation of the Family Planning Association of Kenya (FPAK) in 1961 [KCPS Report, Kenya (1984), p.1] which has since been providing supplies and services to those who need them at a minimum cost.

In 1968, the Government of Kenya launched the National Family Planning Programme through the Ministry of Health which was directly linked to the Maternal and Child Welfare Programme.

Other strategies that have been taken are the provision of basic education through which the norms of a small family can be inculcated into the youth, and the establishment of the National Council for Population and Development (NCPD) in 1982.

The Population Studies and Research Institute of the University of Nairobi has done a lot of valuable research in many areas related to population and development especially in the areas of mortality and fertility where the determinants and differentials of these two dynamics have been explored but the

study of contraception has mainly been used as a determinant of fertility differentials and interesting findings have been reached. Kimani (1982, p.165) for instance found that the levels of contraceptive use in Kenya in 1979 were insufficient to achieve a demographic goal of 3.0 per cent annual growth rate.

Other forth-coming works by Ikamari and Ojakaa have looked at determinants of contraceptive use and causes of discontinuation. A lot of research in the area of contraception still remains to be done. The present study explores just one gap in the knowledge of contraceptive use in Kenya since family planning activities started more than three decades ago and the National Family Planning Programme has been in existence for almost twenty years, it is of vital importance to investigate factors that come into play in the contraceptive scenario in Kenya.

1.2 Statement Of The Problem

Kenya attained independence in 1963. In 1968 it launched an official family planning programme. It should however be noted that the Family Planning Association of Kenya started its operation in 1961. Indeed, by 1968, the FPAK operated over 40 clinics and by 1978, there were over 505 clinics jointly run by the FPAK and the government, with the later running 2/3 of these clinics. By the end of 1984, there were 651 family planning clinics including service delivery points, but excluding private doctors. These clinics were distributed as follows: 12 per cent in Nairobi and Mombasa, 19 per cent in Central, 7 per cent in Coast province, while Eastern and Nyanza provinces had a share of 15 per cent each and Western, Rift Valley and North Eastern provinces had 10, 20 and 1 per cent respectively [KCPS Report, Kenya (1984), p.103]. It is under this organized family planning effort that certain realities about the contraceptive scenario have been made possible through the analysis of Kenya Fertility Survey (KFS) data of 1977/78 and of the Kenya Contraceptive Prevalence Survey (KCPS) data of 1984.

One of the realities is that the intervening years between the two surveys seem not to have improved even the basic knowledge of contraceptive methods. In the KFS, 88 per cent of the sample said they knew at least one family planning method, while in 1984, the KCPS showed that this figure had dropped to 81 per cent. The percentage who knew at least one

modern method in 1978 was 84 per cent as compared to 79.7 per cent in 1984. At the same time, the percentage of currently married fecund women who desired to have no more children had almost doubled standing at 32 per cent in 1984 as compared to only 17 per cent in 1978 [KCPS Report, Kenya (1984), p.55].

This discrepancy needs investigation.

In contrast, contraception adoption has remained slow and contraception prevalence low. Analysis of the Kenya Fertility Survey data of 1977/78 showed that 29 and 32 per cent of all women and married women respectively, had ever used a method of contraception, while 7 and 9 per cent of all women and currently married fecund non-pregnant women were currently using a method of contraception respectively [KFS Report, (1980 p.133)].

By 1984, when the Kenya Contraceptive Prevalence Survey was done, the picture had hardly changed. The same percentage of all women had ever used a method while 33 per cent of ever married women had ever used a method. Current use had changed slightly with 17 per cent of currently married women and currently married fecund, non-pregnant women currently using a method of family planning in 1984, 8.1 and 6.9 per cent were using a modern and traditional method respectively. [KCPS Report, (1984) p.55].

It seems as if there are discrepancies between desire to have no more children, adoption of contraception and use and since existing literature shows that a woman's socio-economic and demographic characteristics have an effect on her knowledge

of both contraceptive methods and on where she can go to get supplies and service (Tsui, 1980; Rodriguez, 1978; Pebley and Brackett, 1983), analysis of this might in part explain the above discrepancy and give some insight both to the policy-makers and to family planning programme managers.

Another reality that forms part of the problem of this study is the fact that in the KCPS sample about 24 per cent of currently married fecund women were in danger of either unplanned or unwanted pregnancies while about 76 per cent of the non-users said they approved of family planning. It is of interest to note, however, that where travel time to source is concerned, only 26 per cent reported travel time of less than 30 minutes, 22 per cent said the journey took them between 30 and 59 minutes and 48 per cent reported travel time of more than one hour. Of particular interest are the rural contraceptive users where only 36 per cent could reach the source within the hour. The rest used over one hour to reach source [KCPS Report, (1984), p.105]. The relationship between travel time to source and contraceptive use is also a component of this study.

For the policy-makers and family planning programme managers, the linkages between the individuals socio-economic and demographic characteristics, her knowledge of both contraceptive method and outlet that supplies information and services and how travel time to the outlet interplays with this knowledge in the decision to adopt contraception, would be of great value.

1.3 Objectives Of The Study:

From the above statement of the problem, the objectives of the study can be stated briefly as:-

(1) The contraceptive prevalence in Kenya stands at 15 per cent. One of the reasons for this might be inaccessibility and unavailability of contraceptive methods. The present study will attempt to assess, at the micro-level, factors that affect availability and accessibility of contraceptive methods.

(2) It has been shown that a woman's socio-economic and demographic characteristics affect the decision to adopt contraception and this decision is also linked to how available and accessible contraceptive methods are. These linkages need to be shown in the Kenyan contraceptive scenario.

(3) Factors that impact upon population change are important in population policy development. It is one of the objectives of this study to assess the importance of the factors that come into play in the use and non-use of contraceptives as this would be valuable information both for population policy development and for the management of family planning programmes.

1.4 Problem Justification.

There have been many attempts to understand factors which impact upon fertility and on family planning use. Most of these attempts have concentrated on an examination of

differential levels of fertility or contraceptive use by various socio-economic background variables. They have largely ignored the question of whether or not couples have access to family planning.

Analysis of the KFS data showed that by 1978 only 20 per cent of family planning users lived near an outlet, despite the fact that the national family planning programme had been in existence for over ten years and the FPAK for much longer. The average land area per clinic was 1,127 square kilometres for all Kenya (Brackett, 1980 p. 6). The KCPS report of 1984 indicates that only 36 per cent of rural users could reach their source within the hour. Examination of factors that come into play in the availability and accessibility of contraceptives should shed some light on some of these problems.

It is already an established fact that women of certain levels of socio-economic status are more likely to use contraceptives. Women who have high levels of education, residing in urban areas and working outside the home tend to use contraceptives more than women with no education, residing in rural areas and not working for a wage. The former tend to use modern methods more, but in recent comparative studies it has been shown that where family planning effort is strong then these differentials tend to be depressed (Cornelius and Novak, 1983, pp.302-317). How availability, accessibility and

1.5 Scope and Limitation.

Studies of contraception in developing countries are faced with two major limitations:-

- 1) Availability and reliability of data.
- 2) Appropriate methods of analysis.

In Kenya, there are several sources from which contraception data can be drawn :-

- (a) Government hospitals and clinics.
- (b) Non-governmental organizations involved in family planning activities.
- (c) Private doctors.
- (d) Kenya Central Bureau of Statistics, mainly from sample surveys. Advantages and limitations of these sources will be discussed in some detail in chapter two.

The present study used the Kenya Bureau of Statistics' most recent demographic survey, namely, the Kenya Contraceptive Prevalence Survey. This was found to be the most appropriate source of secondary data. This data is limited in that it was collected with different objectives in mind and not those of this study. As a result, certain manipulations had to be done to make the data as reliable and as suitable as possible. This is shown and explained in the operational definitions later in this chapter.

The second limitation is in the method of analysis. The methods that have so far been developed in studies of contraception have mainly concentrated on measuring the impact of family planning programmes on fertility levels. Methods such as Couple-Year Protection, Simulation, Standardized Approach and Multivariate Areal Analysis have all been used with some success but these methods cannot show the inter-relationship between socio-economic, demographic and programme effort factors.

Studies attempting to explain these interrelationships have mainly used different variations of regression analysis, such as Multiple Classification Analysis, Log Linear Analysis, Multiple Regression and Path Analysis, (Novak and Cornelius 1983; Entwisle et al, 1982; Mauldin and Lapham, 1985 respectively). These have mainly been comparative studies using either World Fertility Survey data or Contraceptive Prevalence Survey data.

It was after evaluating the above method in relation to the available data that the decision was made to use multiple regression and path analysis together with correlation coefficients.

1.6 Literature Review.

The present day concern for excess fertility in the developing countries evolved in the 1950's and 1960's when it became clear that rapid population growth was seriously hampering development and eroding the already meagre standards of living. The situation in the developing countries prior to the introduction of large national family planning programmes is partially revealed by Knowledge, Attitude and Practice (KAP) Surveys of this period.

Though most of the respondents in these surveys indicated that they did not want more children, knowledge of family planning methods, both modern and traditional, was low (Mauldin, 1965 p. 10). Contraceptives were sometimes available but the availability tended to be limited to the elite who had access to private practice (Brackett, 1980, p.2).

As far as some governments were concerned, leaders were not used to talking about family planning and they did not want to pursue a policy that might have both religious and political repercussions. There was also lack of conviction that excess fertility was a problem.

Since the 1960's, however, there has been a substantial increase in the number of countries that have organized to provide family planning supplies and services and those involved in family planning administration have long

had interest in measuring the effect of increased family planning availability on contraceptive use.

Early attempts to establish this relationship depended primarily on aggregate indications of levels of programme activity, contraceptive use and fertility change (Mauldin and Berelson, 1978 pp. 90-147). While these studies have been an eye-opener, individual level data are required to properly address the issue of the relative influence of socio-economic and family planning availability variables on contraceptives use (Cornelius and Novak, 1983, pp.302-317).

In one school of thought, widespread control of conception is seen mainly as a social response to socio-economic conditions and institutions rather than a response of the individual to these conditions, institutions and to changes in them. Where this is true, there is little focus upon the relevance of personal and family circumstances and experience for individual behaviour to the control of conception. This is in keeping with the theory of Demographic Transition which implies that individuals do not necessarily control births in response to their personal circumstances but that the practice becomes widespread when aggregate mortality declines and social and economic conditions are favourable for the adoption of the small family norm.*

"Family planning is unlikely to be widely adopted in any country until there has been enough social and economic

development to lessen the dependence on local and familial institutions and make smaller families more rewarding than larger families" (Freedman, 1965, pp.417-429).

Other scholars have argued that control of conception is an individual's response as the society goes through the demographic transition, that is, people adopt contraception in order to achieve certain goals or to accommodate certain tastes and preferences. The main element of this argument is that the desire for protection against conception grows out of recognition of hazards and disutilities associated by individuals either with pregnancy itself or with an increase in family size.

Caldwell (1980, pp.225-256) argues that in developing countries widespread control is only possible through provision of mass education which would make it possible for the direction of wealth flow to change from that of the young to the old, to that of the old to the young.

The above interrelatedness between social norms and choice is acknowledged in the postulated conditions for control of conception that have been advanced in a restatement of the demographic transition theory by Coale. He argues that people will control conception where there is acceptance of calculated choice as a valid element in marital fertility as well as when individuals perceive advantages from reduced fertility and when they possess knowledge of effective techniques of fertility control (Coale, 1974, p.65).

A prominent view is that because there exists latent demand in any given fertility population, only knowledge and means of control are needed to ensure the spread of fertility limitation methods, and that people would be motivated to limit fertility once the value of doing so was communicated to them (Mauldin and Berelson, 1978 pp. 89-148). In other words, a population could be prevailed upon to control conception without supporting changes in society. It has, however, been shown that other things being equal, the stronger the family planning effort, the sharper the birthrate decline. The corollary being that people are more likely to practice contraception in areas where there is a strong family planning programme. At the same time, the incidence of fertility control has been shown to be even greater when a strong family planning programme is introduced into a favourable socio-economic setting (Mauldin and Berelson, 1978, pp. 102-148).

Given the above arguments, it has been found that most of the studies on determinants of contraceptive use in developing countries have focused on factors influencing whether or not couples at risk of pregnancy want to limit their fertility. They have not looked at the fact that once a couple decide to limit childbearing or to space births, contraceptive use may be hampered by a lack of family planning information; services or supplies (Pebley and Brakett, 1982 pp 84-92).

Knowledge of both an efficient method of contraception and of a family planning outlet are central where assessment of an existing programme is called for and where factors that relate to these programme elements determine use or non-use of contraception.

One of the major problems that have beset researchers of contraception is how to measure these important variables. The average measure of knowledge of a contraceptive method can range from simple awareness of the name of a method to a rough measure of functional knowledge such as a woman's report that she knows how to use a method (U.N. Manual ix, 1979 p.27-111) which is seen as a pre-requisite to knowledge of a family planning outlet.

Knowledge of a source of contraceptives is not as extensive as knowledge of at least one method of contraception. It has been shown that women who know of a method and where this method can be obtained from are more likely to be using contraceptives than those who only know of a method but not its sources. When more women know of methods but not the sources, there could be bottlenecks at the supply stage (Jones, 1984, pp.24-25).

In a recent multivariate comparative study, it was shown that knowledge of a family planning source appears to approach knowledge of at least one method only when both are almost universal. In Columbia for instance, nearly 90 per cent of married women knew of at least one method and 92.5 per cent knew both of a method and a source of supply.

Conversely, in Honduras, although 93 per cent knew of at least one method, only 77 per cent knew of a family planning source (Cornelius and Novak, 1983 pp. 302-317). In Kenya in 1978, about 84 per cent of the women knew at least one modern method of contraception but only 42 per cent knew where they could go to obtain that method (Pebley and Brackett, 1982 pp.84-92).

Where knowledge of a source is low, then there are differentials in contraceptive use. In Nepal, in 1981, about 48 per cent of married women had never heard of any modern contraceptive method and an additional 17.4 per cent did not know of any family planning service outlet. Of the remaining 36.6 per cent, only one in every five was currently using modern contraceptives, (Cornelius and Novak, 1983 p.309).

Knowledge of a source is related to availability as well as accessibility of contraceptives. In recent surveys the term "availability" has been defined narrowly to consist of two elements;

- (1) Knowledge of a specific source or services to which a user might go.
- (2) Proximity to a source in terms of travel time, mode of transport and convenience.

These two elements can be said to consist of geographic, cognitive, economic and administrative aspects of availability.

Existing literature has shown that the individual's motivation to regulate fertility is determined by demand and supply of children but also that family planning effort plays

The concepts of demand and supply have obviously been a vital role to lessen the differentials that exist between women of different socio-economic and demographic characteristics. This will be examined more deeply in the following section.

1.7 Theoretical Framework.

The psychological models that describe innovative decision-making assume a progressively greater competence in a specific sequence of actions such as seeking information, accepting it and adopting the behaviour as a result and then practising it. A supportive environment assures ready access to the information as well as to the means for carrying out the behaviour and this is the objective of a national family planning programme policy.

Family planning programmes are carried out within a variety of social, economic and cultural contexts, the effects of which coincide with other influences on contraceptive use and fertility.

Fertility control has been viewed in relation to demand and supply of children since it is these two concepts that determine motivation for fertility control. At the same time, social, cultural and economic factors affect fertility through the influence of demand and supply on the motivation to accept and use fertility regulation. Moreover, these social, cultural and economic conditions affect family planning programme activities (Lapham and Mauldin, 1985 pp. 117-137; Mauldin and Berelson, 1978 pp. 89-148).

The concepts of demand and supply have obviously been borrowed from economic theory. Supply is related to natural natural fertility which is defined as:-

"the number of children a couple would have if they made no deliberate attempt at limitation ... supply depends on the number of births and their survival". (Bulatao and Lee, 1983 p.757).

Although the terms are derived from economic theory the supply of children does not change in response to demand since responsiveness depends on fertility regulation. Demand is used to mean the number of children desired by the couple.

In fertility models such as Easterlin's Framework for Fertility Analysis, it is argued that the demand for children and the potential output of children jointly determine the motivation for fertility regulation. The contention is that if potential output falls short of demand, then there is no desire to limit fertility but if the potential output exceeds demand or "excess supply" exists, then parents would be motivated to regulate their fertility (Easterlins, 1978, pp.57-133).

It is important to keep in mind the proponent of the Demographic Transition Theory that family planning is only likely to be widely adopted where there has been enough social and economic development to lessen the dependence on local and familial institutions. The point of departure in this study is that Kenya is in transition and individual response to social changes have already started to be felt, and as such

the concept of supply and demand should be viewed in this light. It should be noted that, however motivated couples might be to regulate their fertility, if they neither have the knowledge of existing efficient contraceptive methods, nor know where to go for these methods then this motivation is only frustrated through the use of inefficient methods.

Conceptually, it is important to examine how a planned family planning programme operates within the socio-economic setting. This conceptual framework at the macro-level draws on work done by Lapham and Mauldin (1985 pp.117-137) and earlier theoretical work done by Easterlin (1978) and Freedman (1961-62 pp. 32-121).

Organized family planning programmes have three major components: policies, resources and stage setting activities; service and service related activities; and availability and accessibility of fertility control supplies and services.

The first component is concerned with those activities that the government and private organizations might undertake in population policies especially as regards fertility regulation, funding and other resource related to direct provision of family planning supplies and services. It also includes involvement of other ministries or agencies in promoting and providing information about population concerns and family planning activities, in appointing senior officials to direct family planning programmes and in encouraging private

sector population activities.

The second component of an organized family planning programme should be designed to make it easier for people to obtain and use a variety of family planning methods. In addition to clinic-based service delivery systems, these activities include information, education and communication (IE&C) activities, the training of personnel in supervision, community-based distribution programmes and other service delivery actions. This component also includes the use of civil bureaucracy to underscore the importance of the programme and help carry it out and also the provision of incentives for increased use of contraceptives, provision of services or information and education.

The third component of programme effort is concerned with recording, keeping and evaluation and this is closely linked with service delivery. An important factor in this component is the management's use of the evaluation findings.

The above three components taken together make possible another component of family planning effort and that is the availability and accessibility of fertility control supplies and services.

The availability and accessibility of effective means of fertility regulation, mediated through provider transactions with clients, in turn lead to its acceptance and use (Mauldin and Lapham, 1985 pp.117-137).

From the above macro conceptual model, it is possible to derive a micro conceptual model based on the following arguments.

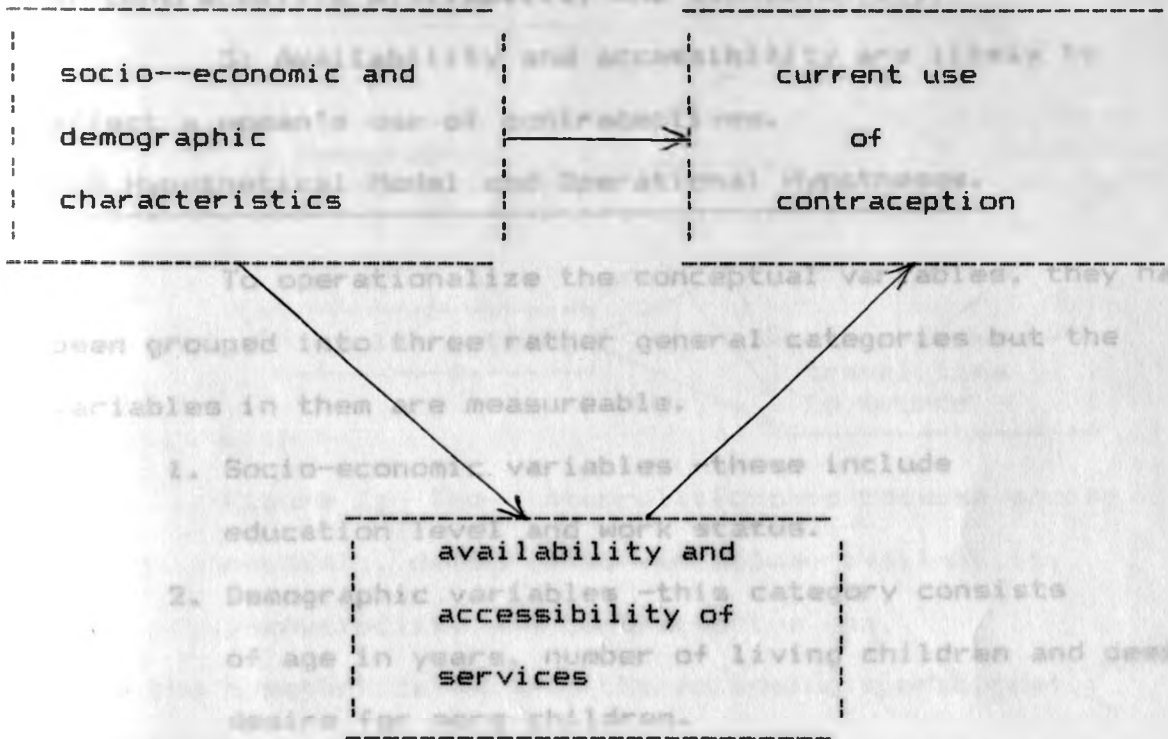
The first component of family planning effort of policies, resources and stage setting can only work through a receptive target group. In other words, women of childbearing ages who have certain socio-economic and demographic characteristics will be more likely to see the advantages of these activities than others. Therefore, a woman's socio-economic and demographic characteristics have a direct link with this component of programme effort.

Again, the second component of service and service related activities will affect some women more than others. If the services are far and wide or are distributed in such a way that women view them as unavailable and inconvenient, it is only women who are highly motivated mainly because of their socio-economic status who will utilise the services.

The third component of availability and accessibility of fertility control supplies and services is very central in the present study. The meaning of availability as defined in the study means the distance a woman has to travel to her family planning outlet in terms of her travel time, while accessibility is defined to mean a woman's knowledge of where she can go to get her supplies and services.

Figure 1.

Conceptual Model



1.7 Theoretical Statement.

"In any given society, a woman's socio-economic and demographic characteristics are likely to have an effect on her perceptions of contraceptive availability and accessibility as well as on her current use of modern contraceptive methods."

Conceptual Hypotheses.

1) A woman's socio-economic and demographic characteristics are likely to affect her current use of efficient contraception.

2) A woman's socio-economic and demographic characteristics are likely to have an effect on her perception of contraceptive availability and accessibility.

3) Availability and accessibility are likely to affect a woman's use of contraceptives.

1.8 Hypothetical Model and Operational Hypotheses.

To operationalize the conceptual variables, they have been grouped into three rather general categories but the variables in them are measurable.

1. Socio-economic variables -these include education level and work status.
2. Demographic variables -this category consists of age in years, number of living children and desire for more children.
3. Social setting variables -this category includes only two measurable variables, namely, mode of transport and residential status.

It is these variables that are put together to produce a model from which the conceptual hypotheses are drawn. The arrows show how the variables interrelate. The background variables affect knowledge of a family planning outlets, travel time to source as well as current use of efficient methods of contraceptives. The interaction between the background variables is not considered as indicated by the curved arrows.

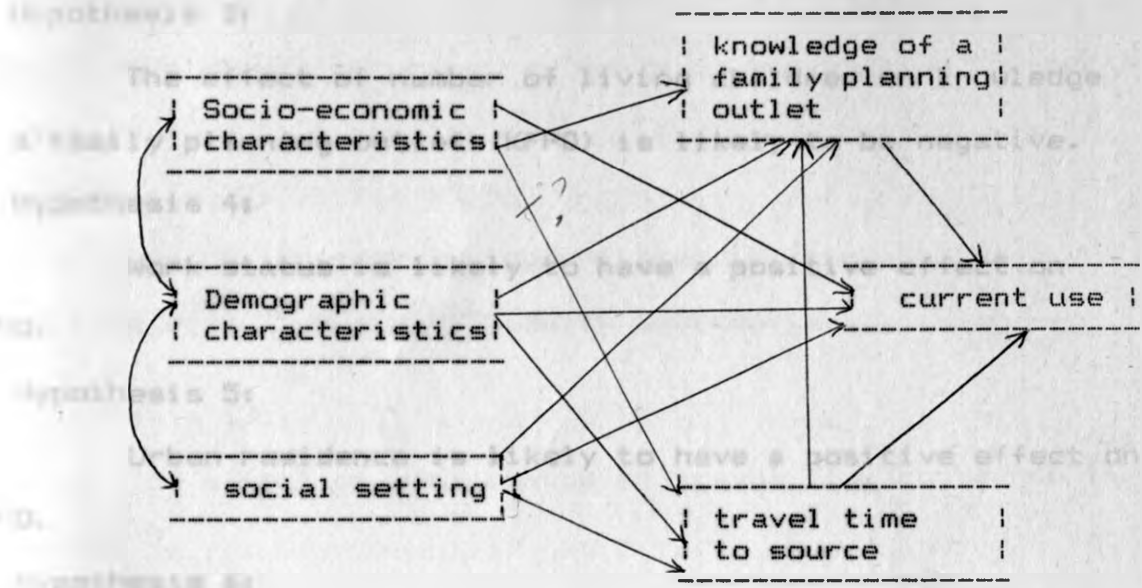


Figure 2; The interrelationship between socio-economic, demographic variables, availability, accessibility and contraceptive use.

From the hypothetical model, the following operational hypotheses have been derived and will be tested in the operational model presented after the hypotheses.

All the variables have been operationalized using the format given in the operational definitions.

Hypothesis 1:

The effect of education on knowledge of a family planning outlet is positive.

Hypothesis 2:

The effect of age on knowledge of a family planning outlet is negative.

Hypothesis 3:

The effect of number of living children on knowledge of a family planning outlet (KFPO) is likely to be negative.

Hypothesis 4:

Work status is likely to have a positive effect on KFPO.

Hypothesis 5:

Urban residence is likely to have a positive effect on KFPO.

Hypothesis 6:

Desire for more children is likely to have a negative effect on KFPO.

Hypothesis 7:

The effect of travel time to source on KFPO is negative.

Hypothesis 8:

The effect of education on travel time to source is negative.

Hypothesis 9:

The effect of age on travel time to source is positive.

Hypothesis 10:

Number of children is likely to have a positive effect on travel time to source.

Hypothesis 11:

The effect of urban residence on travel time to source is negative.

Hypothesis 12:

Desire for more living children is likely to have a positive effect on travel time to source.

Hypothesis 13:

The effect of work status on travel time to source is negative.

Hypothesis 14:

The effect of means of transportation on travel time to source is negative.

Hypothesis 15:

The effect of education on current use of contraceptives is positive.

Hypothesis 16:

The effect of age on current contraceptive use is negative.

Hypothesis 17:

The effect of number of living children on current use of contraceptives is positive.

Hypothesis 18:

The effect of desire for more children on current use of contraceptives is negative.

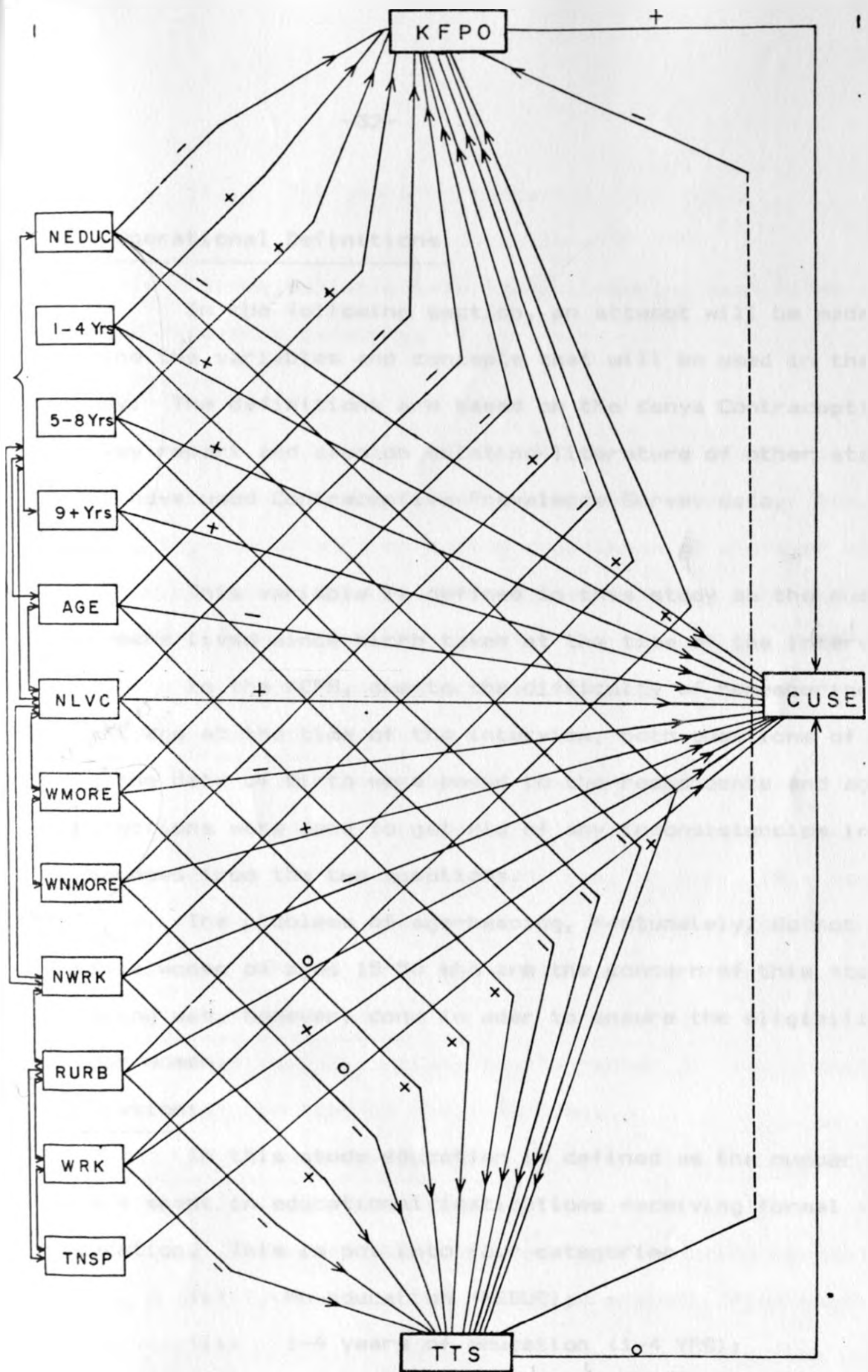


FIGURE 3: Effects of socio-economic, demographic factors on availability, accessibility, and use of contraceptives — Hypothetical Model.

1.9 Operational Definitions.

In the following section, an attempt will be made to define the variables and concepts that will be used in the study. The definitions are based on the Kenya Contraceptive Survey report and also on existing literature of other studies that have used Contraceptive Prevalence Survey data.

Age:

This variable is defined in this study as the number of years lived since birth taken at the time of the interview.

In the KCPS, due to the difficulty of remembering the exact age at the time of the interview, both questions of age and the date of birth were posed to the respondents and age corrections were done to get rid of any inconsistencies in the responses from the two questions.

The problems of age-heaping, fortunately, do not affect women of ages 15-50 who are the concern of this study. Probing was, however, done in order to ensure the eligibility of older women.

Education:

In this study education is defined as the number of years spent in educational institutions receiving formal education. This is put into four categories

- (i) No education (NEDUC);
- (ii) 1-4 years of education (1-4 YRS);

(iii) 5-8 years of education (5-8 YRS);

(iv) 9+ years of education (9+ YRS).

This is a dummy variable with four categories with 9+YRS used as the reference category.

Work Status:

Work is defined in the KCPS as doing jobs other than own household work for payment in either cash or kind, making things for sale or having a business of whatever size from which income accrues. This variable is put into two categories; currently working (WRK) and not working (NWRK). with (NWRK) used as the reference category.

Desire For More Children.

This variable refers to a woman's future reproduction intentions. It indicates whether a woman wants more children in addition to the ones she already has, or not. This is also a dummy variable with two categories; want more (WMORE) and want no more (WNMORE) with the latter as the reference category

Number Of Living Children.

This variable refers to the number of living children per woman at the time of the interview.

Current Use Of Contraceptives.

This is the dependent variable and it refers to those women aged 15-49 years who reported that they were currently using a specific method or had done so a month prior to the interview.

To avoid using a dependent variable which is in dummy form this

variable was scored according to the efficiency of the method as follows:-

Method	Score
Male sterilization	10
Female sterilization	9
Injection	8
IUD	7
Pill	6
Condom	5
Others	4

Source: Population Crisis Committee (Washington, May 1985).

Knowledge of a Family Planning Outlet.

This variable was derived under the specific assumption that women who were currently using a method knew a family planning source outlet. Each woman who said that she was using a method was asked where she had obtained the method from and it is from this response that the variable was derived.

For the non-users, they were asked if they knew where they could go for family planning service and supplies and those whose response was positive were asked to state the outlet.

The response from both groups is the same and this has enabled this variable to be scored according to the proportion of women giving that particular outlet as where they obtained

or would go to obtain their method from. The bigger the proportion the higher the score.

Travel Time To Source:

Travel time to source refers to the time a woman reported it would take her to travel from her home to the family planning outlet. This was put into five categories which were also scored according to the length of time. The shorter the time the lower the score.

<15 minutes =1

Code	15-30	31-45	46-60	61+
	Definition =2	Years to since birth =3	Years completed =4	In force of schooling =5

This variable was scored to enable it to be used without having to resort to dummy variables.

Residential Status.

This variable refers to whether the respondent is residing in the rural or urban area at the time of the interview. The KCPS identified three categories: Metropolitan; which consisted of Nairobi and Mombasa; other urban areas; which included all towns with 2,000 population and over; and rural areas.

For the purposes of analysis, these categories were reduced to two: all urban and rural as the two categories of the dummy variable.

Mode of Transport.

This refers to the means of transportation a woman reported she would use to get to the family planning outlet. This has two categories; transport and walk with the latter used as the reference category.

The following table summarises the variable names, their definitions and codes used in the analysis.

Table 2.3

Variable Codes and Definitions.

Code	Variable Name	Definition	Measure
v219	Age	Years lived since birth	Total years
EDUC	Education	Years completed in formal schooling	NEDUC=1or0 1-4yrs=1or0 5-8yrs=1or0 9+yrs=1or0
WRK	Work status	Working for payment or not	WRK=1or0 NWRK=1or0
RST	Residential status	Residence at interview	RURB=1or0 RRUR=1or0
DMC	Desire for children	Additional wanted	WANT MORE=1or0 WANT NO MORE=1or0
NLVC	Number of living children	Living at interview	Total number

KFFO	knowledge of family planning outlet	Where method was obtained	Scored according to the proportion that reported that outlet
TTS	Travel time to source	Time to reach a family planning outlet	Scored according to the length of time in minutes.
CUSE	Current use of contraception	Method used	Scored according to efficiency of the method.
MOT	Mode of transport	Means used to get to the family planning outlet	TNSP=1or0 WALK=1or0

Additional Definitions for Non-users of Modern

Methods of Contraception.

PKFFO	Perceived Knowledge of a family planning outlet.	Where method would be obtained.	scored according to the proportion who report that outlet.
PTTS	Perceived travel time to source.	Time it would take to get to the source.	Scored according to categories of 15-minutes intervals.

The next chapter discusses data collection, methods of analysis and the expected analytical problems.

CHAPTER TWO

DATA COLLECTION AND METHODOLOGY.

2.1 Introduction.

Studies of contraception are relatively new in the field of demography. It is only in the late 1960's that widespread establishment of family planning programmes took root in the less developed countries and soon after that, studies of contraception concentrated in finding out if all these family planning programme efforts were having any effect on fertility levels.

It is only in the 1980's that the questions of how family planning availability and accessibility are related to contraceptive use have come to light. As such, these studies are beset with problems of availability and reliability of data, as well as, by appropriate methods of analysis and definition of arising concepts.

The first section of this chapter, the sources of contraceptive data available in Kenya will be discussed briefly noting their shortcomings, then the data used in the present study will be discussed, especially in relation to data collection, selection and justification of the sample.

The second section of this chapter examines the methods of analysis and the problems associated with these methods.

2.2 Sources of Data Available in Kenya.

As stated in chapter one p. 12, there are several sources in Kenya from which secondary data for the analysis of contraception can be derived:-

- (a) Government hospitals and clinics;
- (b) Non-governmental organizations involved in family planning activities;
- (c) Private hospitals and clinics;
- (d) Kenya Central Bureau of Statistics.

Government hospitals and clinics are the most widely used sources with 58.3 per cent of current users of modern contraceptives (KCPS Report, 1984, p. 104). It would thus provide some useful data but there are some drawbacks which make this data limiting. First, these hospitals and clinics only keep records for clients who come to the source and cannot provide data for the non-users or users of other sources. Secondly, this source is tied to the Maternal and Child Health Care programme and most of the time and energies are concentrated on the health aspect and not on the family planning programme. It follows, then, that even less time will be spared for the meticulous record-keeping which would make data reliable. Thirdly, the drop-out rate from the family planning programme is known to be quite high which would make it difficult to study family planning clients over a period

of time. This source has, however, been used in some studies with plausible results (Nyonyintono, 1985).

The second source can be said to suffer less from the drawback of being attached to another programme since such organizations as FPAK basically deal with provision of family planning supplies and services. The question here would be one of administration; that is whether there are enough sufficiently qualified personnel who realize the importance of record-keeping and evaluation. From a study done by Mauldin and Lapham (1985, pp.117-137), the scale they give Kenya as far as personnel is concerned shows a lot remains to be done. The other problem faced by government hospitals and clinics would also be experienced by this source.

Private hospitals and clinics have one major drawback as a source of data. It is only clients who can afford private doctors' fees who would use this source. As such, it is only a suitable source of data for very specific analysis.

The Kenya Central Bureau of Statistics (KCBS) is the source of data for a wide range of socio-economic and demographic investigations. It has two main sources from which data of contraception can be derived. The first is the Kenya Fertility Survey (KFS) of 1977-1978 and the Kenya Prevalence Survey (KCPS) of 1984. The main drawback of the KFS data is

that it was a sample survey mainly carried out to provide up-to-date data on fertility in Kenya and contraception questions were only asked currently married women. It was also meant to provide comparable data with other countries involved in the World Fertility Survey. It is only the KCPS which specifically and systematically collected information on knowledge of, proximity to and use of sources of supply together with information on preferred methods of contraception.

The KCPS as a source of secondary data has definite advantages over the other sources mentioned. First, it provides national data on contraceptive users and non-users, their future fertility intentions, availability of contraceptives and reasons for non-use. It is, however, a sample survey carried out with the main intention of providing comparable data with other countries carrying out Contraceptive Prevalence Surveys.

The data for the present study comes from the Kenya Contraceptive Prevalence Survey. In 1983, the government of Kenya signed a contract with Westinghouse Health Systems (WHS) to carry out a survey on family planning in the country. The survey was supposed to give the latest information on fertility levels, the prevalence of contraception, comparable data with other countries participating in contraceptive prevalence surveys and also to provide information on family

planning which would aid policy-makers in planning strategies of population management more effectively.

The survey, which started in March 1984 and ended in September 1984, administered two questionnaires to sampled households; the first was a household schedule which was used to obtain information about household composition, sex and age of the members. The second was the individual de-facto interview of all women aged 15-49 years who were residents in the sampled household the night before the interview. In this, more detailed information on each individual woman was collected.

The individual questionnaire consisted of five sections. The first section collected information on residence, age, education level, tribe, religion and employment.

The second section collected information on the respondent's reproductive behaviour and intentions that are relevant in the analysis of patterns of contraceptive use. These included the number of live births; those that are still living and those that had died; data on the last birth; breastfeeding and abstinence; current pregnancy status; polygamy and age at first union.

The third section collected information on the knowledge and use of family planning; method preference; response for non-use and attitudes towards family planning practice.

The fourth section got information on places where current users obtained their method and whether these were convenient or not. It also collected information on family planning perceptions of those who were not currently using modern methods of contraception.

The last section only collected information from currently married women and it was intended to get information about the respondent's husband's socio-economic characteristics as well as his attitudes towards family size and family planning.

2.3 The Sample Design.

The KCPS sample was composed of 6,240 rural households and 2,223 urban households. Out of the total 8,463 households, a target population of about 6,400 women, aged 15 to 49 years, were expected to be interviewed. The sampling procedure followed was a stratified multi-stage cluster design based on Kenya's National Sample Survey and Evaluation Programme (NASSEP).

In the process of data collection several relevant factors were put into consideration. One was the survey's concern for representativeness of the sample drawn since it was expected to provide reliable provincial estimates in addition to the national level estimates. It was also expected to produce urban-rural differentials.

The reduction of both the sampling and non-sampling errors was also a key concern of the survey. This was achieved through the limitation of the sample to manageable proportions given the resources available. The survey also aimed at balancing the non-sampling and sampling errors while at the same time minimizing the total survey errors. To assure this, accurate mapping of the sampling units and use of quality supervision and enumeration were emphasized.

The following section looks briefly at the NASSEP from which the KCPS sample was drawn.

2.4 The National Sample Survey and Evaluation Programme (NASSEP) Frame.

The NASSEP (1980-1984) frame is one of the national sample frames created by the Kenya Central Bureau of Statistics (KCBS) since 1975 from which samples needed by the government and other users have periodically been drawn. The NASSEP master sample was created in 1980 and was stratified into rural and urban portions.

2.5 Rural Sampling Frame.

The rural portion of the NASSEP frame was further stratified by administrative districts in order to provide district-level estimates required for the current strategy of making districts the focus of rural development. In doing this, several of the less populated districts were merged to

form one stratum and the districts of Samburu and Turkana in the Rift Valley province and of Isiolo and Marsabit in Eastern province were excluded from the frame. The whole of the North Eastern Province was also excluded. In effect, only 27 rural strata were created out of the 44 administrative districts.

Within each rural stratum, a number of sample selection stages were employed to create the frame. The 1979 census Enumerated Areas (EAs) were adopted as the primary sampling units. This decision was made after some practical and theoretical considerations. Each EA was assigned a measure of size equal to the expected number of a 100 households and this way 24 EAs were selected from each stratum for a total of 648 rural EAs.

The second stage was to take each selected EA and segment it into the expected number of clusters based on its measure of size. Then one segment was randomly selected to become the sample cluster in that EA. For the EAs with measure size of one, no segmentation was necessary and the EA was adopted as the sample cluster.

The third stage involved the mapping of selected clusters and a household listing in which 70,641 rural households were listed. This became the rural frame from which various surveys, including KCPS, subsampled households for interview.

2.6 The Urban Sampling Frame.

For the creation of NASSEP urban frame, urban centres were defined as places with a population of 2,000 or over in the 1979 census. The urban frame was further stratified by size of urban centres and seven Urban Strata were created.

Table 2:1
NASSEP URBAN STRATA NAMES AND NUMBER OF PSU, 1984

Stratum No	Stratum Name	No of PSUs
1	Nairobi	60
2	Mombasa	24
3	Kisumu	10
4	Nakuru	8
5	Eldoret	4
6	Thika	4
7	All other towns	40

Source: Kenya Contraceptive Prevalence Survey
Report, 1985

The same steps for the sample selection were followed as for the rural except that the number of EAs and clusters from each stratum was not uniform. A total number of 150 urban clusters were created and formed the urban portion of the NASSEP frame.

2.7 The KCPS Sample Design.

Two objectives of the KCPS were to produce reliable provincial level estimates in addition to the urban-rural differentials. To achieve these two objectives, great care was taken in apportioning respondents between provinces as well as urban and rural areas.

The availability of resources and time dictated the number of respondents to be included in the KCPS sample. The target population of 6,400 women aged between 15 and 49 years was allocated among the provinces as well as urban and rural areas. This was done by using data on the average number of eligible women per household from the KFS. It was estimated that 8,000 households would need to be selected from the NASSEP frame to achieve the targeted population.

To achieve the required provincial estimates, the 8,000 households were first allocated equally among the seven NASSEP provinces i.e. Nairobi, Coast, Eastern, Central, Rift-Valley, Nyanza and Western. This resulted in 1,142 households per province which was rounded to 1,150 households. Then, the 1,150 households in each province were allocated between urban and rural areas in proportion to the urban/rural distribution of that province.

The next step involved the selection of a given number of clusters from the total number of NASSEP clusters in the province.

It was considered appropriate to have fixed sample size per selected cluster mainly in order to facilitate fieldwork logistics. In the rural portion, a sample of 30 households per cluster was fixed and in the urban areas sample sizes of between 15 and 23 households per cluster were fixed. This determined the number of clusters per province. All NASSEP clusters were serially numbered and arranged by districts. The desired number was then selected by use of systematic sampling method.

The last stage involved selecting households for the KCPS interview. For rural areas, the 1983 household listing forms were used for household selection, but in the urban areas, where changes occur frequently, a fresh listing was ordered so as to update the frame.

2.8 Problems and Justification of the Sample.

The main concern of any sample is representativeness and to achieve this all cases picked must have an equal chance of being selected. Various forms of random sampling help in assuring that this is achieved. If a random sample is achieved, not only is representativeness assured, but also the sampling error is minimized (Moser and Kalton, 1979, pp.80-84).

Sampling errors of estimates are measures of sampling deviations. As far as the KCPS was concerned the sampling errors were estimated by use of the cluster package programme

and the following steps were taken to come up with the sampling error estimates.

To begin with, for all the variables, the values from the various enumeration areas in a given strata were summed up and the stratum mean was calculated based on the 24 EAs. The value of each EA was differenced from stratum mean and the result squared. The variance was calculated by pooling over a whole sample and dividing by appropriate constant. The square root of this variance yielded the sampling errors required.

To reduce the sampling errors, the absolute size of the sample, rather than its proportion to the entire population, is the critical factor. It has been shown that a sampling fraction of .50 can reduce standard error to within 70 per cent of the sample variance, but better still, an absolute sample of only a hundred cases will reduce error to within 10 per cent of the sample variance (Moser and Kalton, 1979, pp.69-74).

Although multi-stage sampling was carried out in the selection of the KCPS sample and the procedure went to great lengths to assure representativeness, several shortcomings related to difficulties of data collection in developing countries are noted in the following section.

One of the problems was that the sample lists provided by the head office had numerous errors on selection probabilities which the Provincial Statistical Officers (PSOs)

took alot of time to correct. Some sample lists had serial numbers only and no household numbers.

Another problem involved household replacement in cases where the original household had moved out and a new household had moved into the sampled structure.

There were also difficulties in collecting information on ages and dates of birth both of respondents and of children. Special care was taken in the case of women who reported their ages around 50 years to determine eligibility for the individual interview. A special probe sheet was incooperated into the questionnaire in order to assist the interviewer in eliciting this information.

From the total population of sampled households, 6,807 eligible women were identified and 6,581 were interviewed. The distribution of women interviewed by place of residence is shown below:

Table 2:2

Distribution of Women in the KCPS Sample

by Area of Residence.

Total Number	Percentage	Place of Residence
5,569	86	Rural areas
445	7	Metropolitans
447	7	Other Urban Areas

Source: Derived from the KCPS Report, 1985

This compares reasonably well with the KFS distribution of 88 per cent rural, 8 per cent metropolitan and 5 per cent other urban.

METHODOLOGY.

2.9 Introductory Remarks:

Since the widespread establishment of organized family planning programmes in most developing countries in the late 1960's and early 1970's, there has been concern over the methodological issues on how to measure the impact of these programmes on fertility. So far, the following methods have been used for this purpose with considerable success.

- (a) Standardized Approach;
- (b) Standard Couple-Year Protection (SCYP);
- (c) Component Projection Approach;
- (d) Analysis of Reproductive Process;
- (e) Multivariate Areal Analysis;
- (f) Simulation;
- (g) Experimental Designs;
- (h) Fertility Projection/Trend Analysis.

The choice of the method to be used has largely depended on data availability and the feasibility of application of the the method. It also depends on what is desired to be measured, whether the method can separate programme from non-programme effects and the time period to which the measurement relates. Lastly it depends on the independence and reliability of the method (Manual IX, UN 1979, pp.2-3).

These methods have concentrated on the impact of family planning programmes on fertility. It is only one method, Multivariate Areal Analysis, that takes into account

the availability and accessibility components of contraception at the macro level, and it is from this method that most recent studies of contraceptives have derived variations of regression as a tool of analysis for studying the inter-relationship between socio-economic, demographic factors and the programme effort factors i.e. availability, accessibility and use of contraceptives (Cornelius and Novak 1983; Lapham and Mauldin 1985; Mauldin and Berelson 1978). These variations have included Multiple Classification Analysis, Regression Analysis and Path Analysis.

The main concern of this study is to examine the interrelationships between the socio-economic and demographic factors, availability, accessibility and use of contraceptives. The method chosen is Path Analysis, an extension of Multiple Regression, as it produces direct estimates of the effect of socio-economic and demographic factors on the programme effort factors of availability, accessibility and on use.

2.10 Path Analysis and the Ordinary Least Squares.

The model developed for the study indicates linkages between variables and also some underlying causal process. The study uses Path Analysis in order to estimate the magnitude of these linkages.

Since Path Analysis is underlain by the regression model, the general model has to be estimated using techniques that produce the best estimators for the parameters of the general model and at the same time minimize the degree of error consequent upon the estimation of the model.

In this case, the ordinary least squares will be used for estimation and to do this the general linear model and the assumption that are made will first be examined before looking at the ordinary least squares.

The standard linear regression model requires the least squares method for fitting the data in a mathematical model of the form:-

$$Y_i = A + Bx_i + e_i$$

Where

A is a constant

B is the regression coefficient

e_i is the deviation of the observed Y_i from its

expected value, normally referred to as the error term

The regression equation gives the average value of Y for a given X but Y does not indicate the strength of the relationship between Y and X, however B shows the average amount of change in the dependent variable Y per unit change in the independent variable X. In other words, it denotes the slope of the least score line while A indicates the intercept of this line with Y -axis.

The random error, e_i , arises as a result of factors other than X which account for the observed variation in the dependent variable Y .

For the general linear model to produce acceptable results, it entails that a set of assumptions be met. Deegan classifies these assumptions into three categories; those necessary for certain mathematical operations such as determining the means and variances, those assumptions needed for least squares operations, and those assumptions relied on for significance testing (Asher, 1976, p.25).

The assumptions needed for least squares operation concern the error component of the model and they are important especially where path analysis is to be used. They stipulate that the error term should have a mean of zero; meaning that the error term is drawn from a distribution that has the same variance. It is also assumed that each error term is independent or that there is no correlation between any two error terms and also that the error term in any one equation is uncorrelated with the independent variable.

For the last assumption to hold, a recursive system of equations is necessary and since the model developed in this study is recursive, the ordinary least squares will be used as estimators.

2.11 The Ordinary Least Squares (OLS).

There are several reasons why the least squares (OLS) procedure is preferred for the testing of fit of the specified model. The first reason is the simplicity of the computation required and the second is that certain assumptions made about the error term make it possible to derive statistical property from the OLS estimators and the third reason is that when the assumptions are met, the statistical properties of the OLS are generally preferred to those of other linear estimators (Hanushek and Jackson, 1977, pp.28-30).

One of the central properties of the OLS is that the estimators themselves are random variables. They are random because of the presence of the error term in the observed values of Y that are used to calculate estimated coefficients.

The most important distributional parameters are the mean and the variance of the estimators. In particular, under the assumption about the distribution of the error term, OLS estimators $b_1, b_2, b_3, \dots, b_k$ are unbiased estimators of $B_1, B_2, B_3, \dots, B_k$.

Another property of the OLS is that the estimates of $b_1, b_2, b_3, \dots, b_k$ will not equal the true values exactly, the closeness will depend on the distribution of the estimators in particular upon the variance of the estimators.

In the model developed here if Y_1 and Y_2 equations are taken as examples, the following would be the procedure of the OLS. First Y_1 is regressed on $X_1, X_2, X_3, \dots, X_{11}$ and a new

variable, predicted Y_1 , obtained. Similarly, Y_2 is regressed on the same exogenous variables and the predicted Y_2 created. The errors associated with the new variable are now uncorrelated and OLS can be applied to estimate the model.

2.12 Path Analysis.

It has already been shown that the regression equation only gives the average value of Y for a given X but Y does not indicate the strength of the relationship between Y and X . For this, path analysis will be used mainly because it requires the same assumptions for the general linear model but yields much richer information (Asher, 1976, pp.32-34).

Path analysis is a multivariate technique useful in explicating linear causal models. It bears close affinity to multiple regression analysis but makes explicit the underlying assumptions and interconnections. It is basically concerned with estimating the magnitude of the linkages and using these estimates to provide the information about the underlying causal process (Asher, 1976, p.29).

It is a technique of handling related variables in structural models, defined as either exogenous or endogenous. The relationship between a set of exogenous variables and an endogenous variable is expressed by a structural equation of the order:

$$Y = b_1X_1 + b_2X_2 + b_3X_3 + \dots + b_kX_k + e$$

where Y represents the endogenous and the X's and the e the exogenous and the error term respectively. The parameters are assumed to be invariant.

2.13 Expected Analytical Problems.

----- Multicollinearity. -----

The term multicollinearity was coined by Ragner Frisch and originally it meant the existence of a perfect or exact linear relationship among some or all explanatory variables of a regression model.

The term is used in regression to mean an analytical problem of highly correlated independent variables which affect the regression coefficient by raising the standard error of estimates (Asher, 1976, p.48).

One source of multicollinearity is through aggregation of data since the random measurement error is suppressed whereas in individual studies the error term is always present and this attenuates the estimated coefficients and thus counters multicollinearity. Large samples are preferred to small ones as these have been shown to reduce collinearity.

The present study uses data from individual sample of 3,236 respondents. Although multicollinearity is not expected to be absent, it is hoped that the correlations between any two variables will be well below a perfect correlation of 1.0.

Dummy Variables.

In general, multiple regression requires that variables are measured on interval or ratio scale and the relationship among the variables are linear and additive (Jae-On Kim et. al. 1970, SPSS, p.320). Where this is not the case, and categorical variables have to be used, then they have to be transformed into dummy variables.

In the use of dummy variables one category has to be used as a reference category since in the case of education in the present study:-

$$9+YRS = 1 - (NEDUC + 1-4YRS + 5-8YRS)$$

and 9+YRS is a perfect linear function of NEDUC, 1-4YRS and 5-8YRS. The suppression of one category enables the OLS to be used under the usual assumptions.

For the dummy variables used in the study,

9+YRS

NWRK

RURR

WNMORE

WALK

will be used as the reference categories.

CHAPTER THREE

Standardized and Unstandardized Coefficients.

The use of standardized or unstandardized coefficients depends on the particular study in question. Where comparison of phenomena across population is required, then the unstandardized regression coefficients may be used. These coefficients are unaffected by the variable variances that result from stratification of data set.

Where comparison of phenomena within the same population is required, beta or standardized coefficients are preferred as they provide a way in which the relative effect on the dependent variable may be compared (Jae-On Kim et. al. 1970, SPSS, p.325).

The beta coefficients will be used to a greater extent than regression coefficients in this study, since the same betas can be used as path coefficients in path analysis. This is demonstrated in the findings and interpretation of multiple regression analysis in chapters three and four.

- a. Ethnic-linguistic characteristics
- b. Religious characteristics
- c. Social setting characteristics

the first broad group included

eg. Level of education which has been put into four

groupings namely, no education, primary 1-4 years of

CHAPTER THREE
FINDINGS OF THE ANALYSIS FOR THE NON-USERS OF MODERN
CONTRACEPTIVE METHODS.

3.1 Introduction.

In chapter two pp. 51-52, the methods of analysis that have been used in studies of contraception are examined. The main method of analysis for this study, path analysis, an extension of multiple regression is discussed with particular reference to the assumptions that are made. Pages 57-59 deal with expected analytical problems and ways of dealing with them.

In this chapter, the socio-economic and demographic factors that come into play in the perceived availability and accessibility for those who are currently using inefficient contraceptive methods, but who know at least one efficient method and where this method can be obtained, will be examined.

The factors that have been considered fall into three broad groups:-

- a. Socio-economic characteristics;
- b. Demographic characteristics;
- c. Social setting characteristics.

The first broad group includes:-

- (i) Level of education which has been put into four categories; namely, no education (NEDUC); 1-4 years of

education (1-4 YRS); 5-8 years of education (5-8 YRS); and 9 and more years of education (9+ YRS). In the regression analysis, this is used as dummy variable with four categories.

(ii) Work status: This has been put into two

categories; those currently working (WRK) and those not working

(NWRK). Out of the KCPG sample of 5,281 cases, a sub-sample of

The group of demographic characteristics includes:-

(i) Age, which is the total number of years lived since birth.

(ii) Number of living children (NLVC); which means the total number including the current pregnancy.

(iii) Desire for more children which has been put into two categories: want more (WMORE); want no more (WNMORE).

The last group consists of two characteristics which have been termed as social setting or environmental factors

Variable	Mean	Variable	Mean
EDUC	0.4298	WMORE	0.3348
1 YRS		RURB	0.1389
2 YRS	0.2434	PTNSP	0.8611
3 YRS		PTNSP	3.9874
4 YRS	29.5827	PTNSP	0.1657
5 YRS		PTNSP	1.171
6 YRS	0.2711	PTNSP	3.0922

The reference categories for the dummy variables have been explained on page 58.

The characteristics explained above are the independent variables which are hypothesized to have effect on two dependent variables; knowledge of a family planning outlet and travel time to source. As explained in chapter one, section 1:9 pp. 32-37, on operational definitions, knowledge of planning outlet is scored according to the proportion of

respondents who reported a certain source as the one they would use to get their method. Travel time to source is put into five categories of fifteen minutes intervals and then scored in ascending order.

3.2 Base Population.

Out of the KCPS sample of 6,581 cases, a sub-sample of 3,236 of all those who are currently married fecund non-pregnant women aged 15-49 years was picked out by use of the Statistical Package for the Social Sciences (SPSS) computer programme. Table 3:1 gives the mean values for the variables under consideration.

Table 3:1

Mean Values for Selected Variables.

Variable	Mean		Variable	Mean
NEDUC	0.4298	:	WNMORE	0.3348
1-4 YRS	0.1924	:	RURB	0.1389
5-8 YRS	0.2670	:	RRUR	0.8611
9+ YRS	0.1092	:	PTTS	3.9874
AGE	29.5827	:	PTNSP	0.1857
NLVC	4.0078	:	PWALK	0.2121
WMORE	0.5711	:	PKFPO	3.0922

Comments on the Mean Values:

The mean values of the selected characteristics show that the 3,236 currently married fecund non-pregnant women have an average age of 29.5 years. About 42 per cent have had no formal education as compared to 19 per cent who have had

1-4 years of formal education and 26 per cent and 10 per cent who have had 5-8 and 9+ years of education respectively. This sample has a mean of 4 living children and about 57 per cent want to have more children as compared to 33 per cent who want to have no more children. About 14 per cent reside in urban areas and 86 per cent live in the rural areas.

The mean values also indicate that for the non-users of modern contraceptive methods, travel time is between 46-60 minutes. When the scores for the knowledge of a family planning outlet are examined, they show an average score of 3, which means that, on average, a woman in this group would choose either a pharmacy or a shop as her source.

Before exploring in depth the interrelationship between the independent and the dependent variables, simple correlations between the exogenous variables, travel time to source and knowledge of a family planning outlet are presented.

3.3 Correlation Coefficients.

In the following section, the correlation between the independent variables, knowledge of a family planning outlet and the travel time to source will be examined.

Table 3:2

The next variable that shows some interesting Correlation Coefficients Between Knowledge of a Family Planning Outlet, Travel Time to Source and Selected Independent Variables.

Independent Variables	Knowledge of a Family Planning Outlet	Travel Time to Source.
NEDUC	-.18844	.12942
1-4YRS	-.00633	-.01586
5-8YRS	.15301	-.13140
9+YRS	.09142	.00111
NLVC	.05406	-.06300
AGE	-.05276	.04454
WRK	-.06568	.00244
NWRK	-.02770	-.02629
WMORE	.00183	-.00542
WNMORE	.01587	-.00845
PWALK	-	-.43502
PTNSP	-	-.54722

Comments on correlation coefficients:- an average number of

living children, then this argument still holds and could be extended for those women who desire to have more contraceptive methods shows interesting correlation with their reported knowledge of a family planning outlet which can generally be described as moving from being negatively correlated to being positively correlated as the level of education rises. This would tend to indicate that education has such an impact on knowledge of a family planning outlet that women who have no formal education would tend report longer travelling time, while those who have had 1-4 years and 5-8 years of education will report shorter travelling time. The positive correlation between those with 9+ years of education and travel time to source might mean that these women would prefer to use sources that are farther afield, such as

The next variable that shows some interesting correlation with knowledge of a family planning source, is number of living children. Theoretically, this is expected to show negative correlation, but this turns out to be positive. It should be noted, however, that these are users of traditional or inefficient methods and the more children the respondent has the more she is likely to know of family planning sources since these are the same sources used for maternal and child health care services.

The above argument would appear to be a contradiction to the negative correlation of age and knowledge of a family planning outlet, but considering that the average age for this group is 29.5 years and that they have an average number of four living children, then this argument still holds and could even be extended for those women who desire to have more children and those who desire to have no more children.

The correlation between the background variables and travel time to source presents an interesting picture. No education is positively correlated to travel time to source: an indication that women who have no formal education would tend to report longer travelling time, while those who have had 1-4 years and 5-8 years of education will report shorter travelling times. The positive correlation between those with 9+ years of education and travel time to source might mean that these women would prefer to use sources that are farther afield, such as

private clinics which would make them report longer travelling times.

Use of some means of transportation has negative correlation to travel time to source which is expected since those who would use some form of transportation would report shorter travelling times.

An in-depth analysis of the interrelationship between the independent and the dependent variables using multiple regression and path analysis gives a clearer picture.

3.4 Findings and Interpretation of Multiple Regression.

The operational model developed earlier, indicated the structural relationship between the independent variables and the dependent variables. The SPSS computer programme was used to write multiple regression programmes which were run on the computer many times, each time adjustment being made to the variables. This way problems of multicollinearity and use of dummy variables, were dealt with. This was necessary since the data set was new and some of the transformations were not suitable for the methods of analysis undertaken in this study.

The final computer print-out presented a number of statistical values such as the F-values, the Standard error, the Unstandardized and Standardized beta values and the actual

vigorous Analysis of Variance.

The standard errors of estimates are given in parentheses.



Since the purpose of this section is to show the influence of socio-economic and demographic factors on knowledge of a family planning outlet, the results of the full and trimmed non-recursive models will be given. The full model is run with all the paths included, except the reference categories for the dummy variables, then the most important variables that meet the statistical criteria of F table value 6.63 at .01 level and T=.001 are retained and the resulting model is tested.

The results from the full model are given by the following structural equations generated by the model:

$$\begin{aligned}
 KFPO = & - .108 NEDUC - .063 1-4YRS - .029 5-8YRS - .016 AGE \\
 & \quad (0.142) \quad (0.154) \quad (0.142) \quad (0.006) \\
 & + .063NLVC + .006WMORE - .037WRK + .124RURB \\
 & \quad (0.020) \quad (0.096) \quad (0.049) \quad (0.119) \\
 & - .807PTTS \\
 & \quad (0.025) \\
 \\
 PTTS = & .065NEDUC + .010 1-4RYS - .048 5-8YRS + .076AGE - .117NLVC \\
 & \quad (0.083) \quad (0.090) \quad (0.083) \quad (0.003) \quad (0.012) \\
 & - .036WMORE - .018WRK + .108RURB - .527PTNSP \\
 & \quad (0.056) \quad (0.029) \quad (0.069) \quad (0.058)
 \end{aligned}$$

For the trimmed model that omits all paths that are not significant at table value of F(1,3233) at .01 = 6.63, the equations are:-

$$\begin{aligned}
 KFPO = & - .086 NEDUC - .044 1-4YRS + .048NLVC \\
 & \quad (0.091) \quad (0.0110) \quad (0.015) \\
 & - .038WRK + .128RURB - .808 PTTS \\
 & \quad (0.048) \quad (0.116) \quad (0.025) \\
 \\
 PTTS = & .061NEDUC - .063 5-8YRS - .048NLVC \\
 & \quad (0.054) \quad (0.059) \quad (0.008) \\
 & + .110RURB - .528PTNSP \\
 & \quad (0.066) \quad (0.058)
 \end{aligned}$$



The standard errors of estimates are given in parentheses.
 Figure 4: Factors on knowledge of a family planning outlet - The Full Model

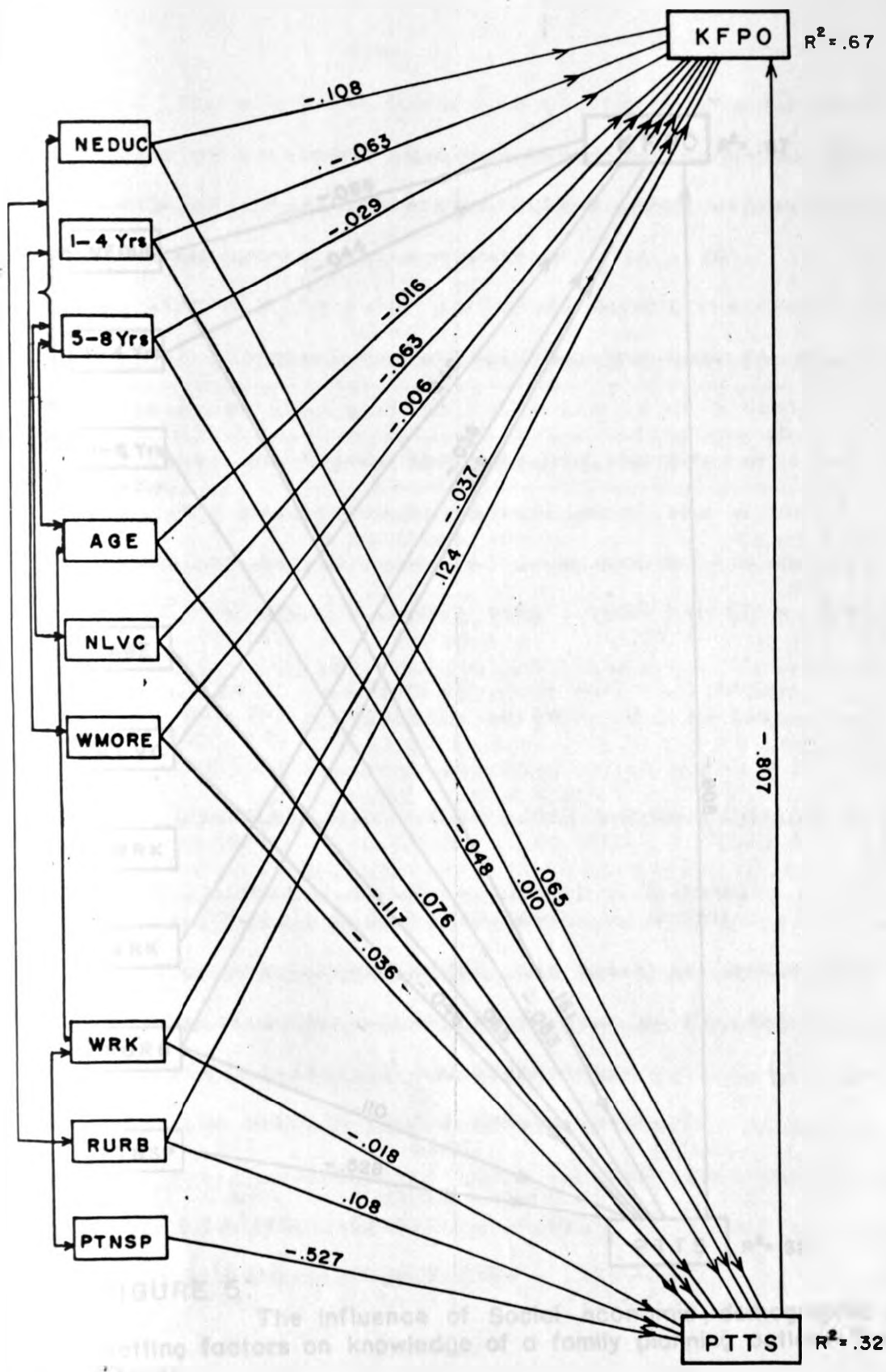


FIGURE 4:

The influence of Socio-economic, demographic and social setting factors on knowledge of a family planning outlet - The Full Model

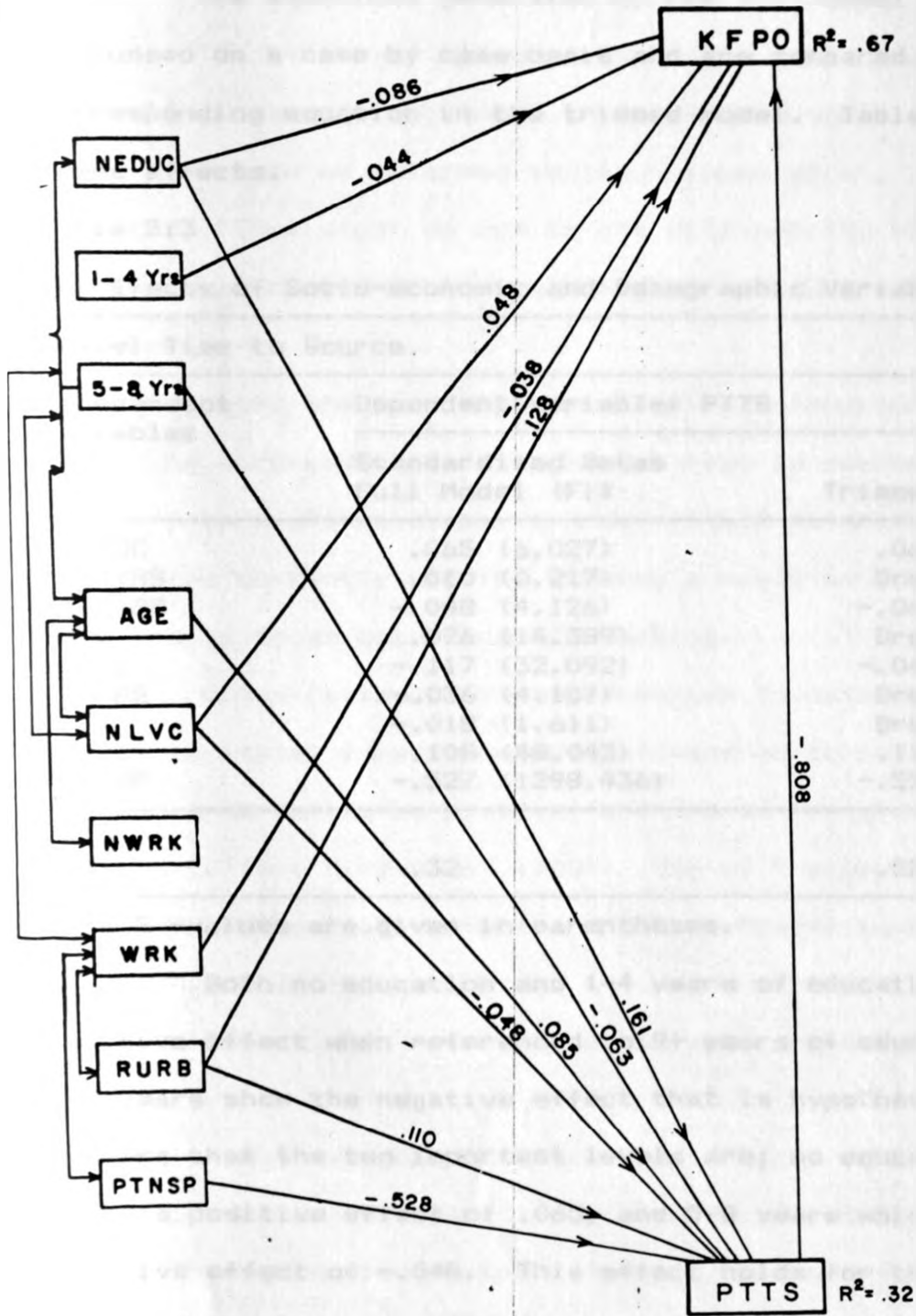


FIGURE 5:
The influence of Social-economic, demographic and social setting factors on knowledge of a family planning outlet— The Trimmed Model.

The equations generated by the full model are discussed on a case by case basis and are compared with the corresponding equation in the trimmed model. Table 3:3 shows these effects.

Table 3:3 The Effects of Socio-economic and Demographic Variables on Travel Time to Source.

Independent Variables	Dependent Variable: PTTs	
	Standardized Betas Full Model (F)*	Trimmed Model (F)*
NEDUC	.065 (6.027)	.061 (12.537)
1-4YRS	.010 (0.217)	Dropped
5-8YRS	-.048 (4.126)	-.063 (13.700)
AGE	.076 (14.389)	Dropped
NLVC	-.117 (32.092)	-.048 (10.309)
WMORE	-.036 (4.107)	Dropped
WRK	-.018 (1.611)	Dropped
RURB	.108 (48.042)	.110 (55.026)
PTNSP	-.527 (1298.436)	-.528 (1304.502)

R² = .32

*The F-values are given in parentheses.

Both no education and 1-4 years of education show a positive effect when referenced to 9+ years of education, while 5-8 years show the negative effect that is hypothesized. It appears that the two important levels are; no education which shows a positive effect of .065; and 5-8 years which shows a negative effect of -.048. This effect holds for the both the full and the trimmed models.

The effect of age on travel time to source is positive as is hypothesized. Although this variable meets the statistical criteria to be retained in the trimmed model, it is not

retained. This might be due to its collinearity with such variables as number of living children and desire for more children.

Among the demographic variables, number of living children shows the strongest effect on travel time to source (-.117).

Work status shows reversed effect to what is expected with those currently working showing a negative effect as compared to those not currently working.

Urban residence is hypothesized to have a negative effect on travel time to source as compared to rural residence, but it turns out to be positive and one of the strongest

effects in this direction (.108). Use of transportation shows the strongest overall effect (-.527) on travel time to source in the hypothesized direction.

The results for knowledge of a family planning outlet. The trimmed model shows the same trend as the full model.

These variables explain about 32 per cent of the variation in an individual's perceived travel time to source. Use of transportation, urban residence, 5-8 years of education, no education and number of living children are the variables that show the strongest effects.

When the three levels of education are compared to the level of education, which is the reference category, they turn out to be negative and the effect decreases as the level of education increases. The effects of socio-economic, demographic variables and travel time to source on knowledge of a family planning outlet are examined next.

Table 3:4

The effect of age is negative, as is expected, but the effect of age is not significant. The effects of Socio-economic, Demographic and Social

Setting Variables on Knowledge of a Family Planning Outlet.

Independent Variables	Dependent Variable: KFPO	
	Full Model (F)*	Trimmed Model
NEDUC	-.108 (34.388)	-.086 (53.052)
1-4YRS	-.063 (5.570)	-.044 (15.085)
5-8YRS	-.029 (3.082)	Dropped
AGE	-.016 (1.368)	Dropped
NLVC	.063 (19.341)	.048 (21.377)
WMORE	.006 (0.294)	Dropped
WRK	-.037 (12.942)	-.038 (14.300)
RURB	.124 (129.789)	.128 (146.747)
PTTS	-.807 (6143.421)	-.808 (6202.478)
R	.67	.67

*The F -values are given in parentheses.

The results for knowledge of a family planning outlet equation indicates no significant differences between the full and trimmed models. When the variables that do not meet the specified statistical criteria are removed, the R remains the same while the calculated F -values for the remaining variables increase showing that the variables left in the equation are the most important.

When the three levels of education are compared to 9+ years of education, which is the reference category, they turn out to be negative and the effect decreases as the level of education increases.

The effect of age is negative, as is expected, but this effect is insignificant to justify the path being removed from the model. Related to this is the effect of number of living children which turns out to be positive. This agrees with other findings in developing countries where modern

contraceptive methods are perceived as lowly available, but

contradicts findings from countries where both knowledge of a modern contraceptive method and knowledge of a family planning outlet are almost universal (Cornelius and Novak,

1983, p.309). Desire for more children turns out to be positive but the effect is so small that the path is dropped from the model.

It has been found that labour participation affects a woman's knowledge of modern contraceptive methods and her perceptions of where she can go to get family planning supplies. In this case, work status shows a negative effect as

compared to no work and this is quite significant. This would appear to contradict the effect of urban residence which shows a strong effect in the expected direction (.124).

This trend is the reverse of that for travel time to source. Travel time to source shows the strongest negative effect on knowledge of family planning outlet and this even increases, though slightly in the trimmed model.

The selected socio-economic and demographic variables explain about 67 per cent of an individual's variation in knowledge of a family planning outlet with travel time to source, urban residence and no education showing the strongest effect.

3.5 Conclusion.

The results show that education is a strong determinant of a woman's perception of how long it would take her to get to her family planning source.

The trend indicates that the reported travel time gets shorter as the level of education rises. Those with less than 9+ years of education are likely to report longer travelling time to source. The positive effect of no education (.065) indicates that this group will report the longest time, followed by those with 1-4 years of education (.010) while those with 5-8 years of education will report the shortest travelling time to source.

The above findings agree with those of levels of education on knowledge of family planning outlet which shows that those with less than 9+ years of education have less knowledge but this increases as the level of education increases.

This trend is the reverse of that for travel time to source which decreases as education increases showing the differentials in both accessibility and availability by level of education. It has been found in other studies that these differentials are observed in countries where family planning availability and accessibility is low (Cornelius and Novak, 1983, pp.309-311) and the results from this study confirms this.

As regards age, consistent results are recorded with older women showing less knowledge of a family outlet, as indicated by the negative effect of age, and at the same time reporting longer travel times to source as shown by the positive effect of age on travel time to source.

Number of living children again shows consistence with findings from other countries. While women of higher parity might have more knowledge of a family planning outlet or perceive these sources as available due to use of maternal and child care facilities it is also feasible to argue that where family planning services are both available and accessible, women of both high and low parity should show about the same perceptions. Where this is not the case, women of higher parity are motivated to know these sources due to fear of unwanted pregnancies while younger women are not motivated to plan their families right from the start.

The strong negative effect of travel time to source (-.807) indicates that this is a depressing factor on both

knowledge of a family planning outlet and the probability of use since a woman whose perception of accessibility are not depressed by travel time is likely to have more knowledge of different sources and her probability of using these sources

are higher than those of a woman who perceives the sources as inaccessible and unavailable.

Women who feel that they would use transportation to their sources perceive these sources to be accessible as indicated by the $-.527$ effect of transportation on travel time to source. This is interesting considering 47.6 per cent of the rural non-users of efficient methods in the KCPS said that they would have to walk to their sources and about 65 per cent reported that it would take them an hour or more to reach their source (KCPS, 1984, pp.109-110).

It has been found in other studies that where family planning availability levels are low or moderate there are distinct differentials in perceptions of availability and accessibility (Cornelius and Novak, 1983, pp.302-317) and the present study confirms this as far as Kenya is concerned.

Comparison of the perceptions of the non-users of modern contraceptive methods with determinants of travel time to source, knowledge of a family planning outlet and current use of efficient methods, presented in the next chapter, give further insights into factors that come into play in the Kenyan contraceptive scenario.

(ii) Age, CHAPTER FOUR

ANAYLSIS AND FINDINGS FOR CURRENT USERS OF MODERN

CONTRACEPTIVE METHODS.

4.1 Introduction.

Perceptions of the non-users of efficient methods of contraceptives presented in chapter three give an insight of how some of the future potential users view contraceptive availability and accessibility in Kenya.

In this chapter, the findings of the effects of socio-economic and demographic factors on current use of efficient methods of contraceptives will be presented.

The socio-economic variables are the same as those used in examining the patterns of knowledge of a family planning outlet for the non-users of modern methods of contraceptives presented in chapter three.

(i) Education levels, which is expressed as a dummy variable with four categories namely; No Education (NEDUC); 1-4 yrs; 5-8 yrs and 9+ yrs with the last category used as the reference category in the regression.

(ii) Work Status also expressed as a dummy variable with dual categories namely; currently working (WRK) and not working (NWRK) as the reference category.

The same demographic variables used for the non-users of modern contraceptive methods are used for the current users:-

- (i) Age, which has been defined as complete years since birth.
- (ii) Number of living children which means the total number of live children a respondent had at the time of the interview including current pregnancy.
- (iii) Desire for more children indicated whether a respondent wanted to have additional children or not. This is also put into two categories namely; Want More (WMORE) and Want No More (WNMORE) with the latter as the reference category.

The two social setting variables used are:-

- (i) Residential Status which indicated whether a respondent resided in urban or in the rural areas. This variable had two dummy categories; Residence Urban (RURB) and Residence Rural (RRUR). Residence Rural is used as the reference category.

- (ii) Mode of Transport (TNSP).

There are two intervening variables:-

- (i) Knowledge of a family planning outlet (KFPO) which has been scored according to the proportion of respondents who gave the specified sources as the the outlets from which they obtained their supplies and services. The larger the proportion, the higher the score.
- (ii) Travel time to source. This was collected in total number of minutes it took the repondent to get to her source of family planning method. This was first of all put

into five categories of fifteen minutes intervals and then scored in ascending order. The scoring enabled the two intervening variables to be used in regression analysis without resorting to dummy variables.

The dependent variable is current use of an efficient method of contraceptives (CUSE). Once again, to avoid using the dependent variable in dummy form, the methods were scored according to their efficiency using a given criterion. The definitions of the variables are given in chapter one section 1.9, pp.32-37.

VARIABLE	MEAN	S.D.	VARIABLE	MEAN
EDUC	0.4295	1	WAGE	0.2348
3-5YRS	0.2670	1	RUR	0.5613
AGE	29.8037	1	TRIP	0.0478
WAGE	0.5711	1	SPFD	0.5742

The mean values of all the characteristics to the base population are presented first followed by simple correlation coefficients between the selected variables. Using multiple regression and path analysis, the interpretations of the effects of socio-economic and demographic factors on current contraceptive use have been examined.

4.2 Base Population.

The base population was picked out of the KCPS sample of 6,581 respondents which consisted of women aged 15-49 years. A sub-sample of 3,236 currently married fecund non-pregnant aged 15-49 years was randomly picked out using the SPSS computer programme. The main reason for picking this group was because it was felt that it is the most exposed to unplanned pregnancies. Table 4.1 gives the mean values for the variables under consideration.

The mean values of the selected variables show that the 3,236 currently married, fecund, non-pregnant women have an average age of 29.5 years and that about 42 per cent have had no formal schooling while 19 and 26 per cent have had 1-4 years and 5-8 years of formal education respectively and about 10 per cent have had nine or more years of formal education.

Table 4:1

Mean Values for Selected Variables.

VARIABLE	MEAN	VARIABLE	MEAN
NEDUC	0.4298	WNMORE	0.3348
1-4YRS	0.1924	RURB	0.1389
5-BYRS	0.2670	RRUR	0.8611
9+YRS	0.1092	TTS	4.7996
AGE	29.5827	TNSP	0.0478
NLVC	4.0078	WALK	0.0435
WMORE	0.5711	KFPD	0.6741

This sub-sample has an average of four live children and about 57 per cent desire to have additional children while score for travel time to source is 4.7 which can be taken to mean that, on average, these respondents would use about an hour or more to get to their source of supply.

It must be accepted that the mean values are very crude measures and they have only been used here to highlight the major characteristics of the base population.

Correlation Between Knowledge of a Family Planning

4.3 Correlation Coefficients, Tables.

In this section, the correlation between the independent variables, the two intervening variables and the dependent variable will be examined.

Table 4:2

Correlation Between the Independent Variables, the Intervening Variables and Dependent Variable.

Independent Variables	Intervening Variables KFPO	TTS	Dependent variable- CUSE
NEDUC	-.14912	.1013	-.15380
1-4YRS	-.05378	.04285	-.02330
5-8YRS	.05713	-.07684	.04367
9+YRS	.22176	-.10284	.21116
NLVC	.05714	-.07725	.11281
AGE	.06137	-.07319	.07797
TNSP	.69423	-.62634	.57907
WALK	.65861	-.47524	.54313
WRK	-.13357	.05137	-.15010
NWRK	-.13763	.05742	-.14465
WMORE	-.11045	.10982	-.14262
WNMORE	.12063	-.11471	.15366
KFPO	1.000	-.80128	.80439
TTS	-.80128	1.000	-.66093
CUSE	.80439	-.66093	1.000.

Age is positively correlated with knowledge of a

family planning outlet and again this can be explained by the

fact that older women are more likely to have more children

and more involved of a family planning outlet either for

the sake of maternal and child health care or for the

purpose of child-spacing.

4.3.1 Correlation Between Knowledge of a Family Planning
Outlet and the Independent Variables.

Levels of education show interesting correlation with knowledge of a family planning outlet. As was expected, there is a negative correlation between this intervening variable and no education but this increases slightly from -.14 to -.05 as the level of education increases to 1-4 years. At 5-8 years of education, the correlation is positive at 0.05 level and this shoots to .22 level at 9+ years of education. This would tend to indicate that education has a consistent impact on knowledge of a family planning outlet.

Number of living children is positively correlated to knowledge of a family planning outlet, as was hypothesized. This is expected considering that contraceptive methods are used both for childspacing as well as for stopping child-bearing. Another aspect is that these are the same sources used for maternal and child health care facilities and women with children are more likely to know these sources than those without children.

Age is positively correlated with knowledge of a family planning outlet and again this can be explained by the fact that older women are more likely to have more children and thus more knowledge of a family planning outlet either for the purpose of maternal and child health care or for the purpose of child-spacing.

Another variable that shows interesting correlation with knowledge of a family planning outlet is work status. Both categories, working and not working, show negative correlation and this might indicate that the respondents did not understand the concept of work as it was defined in the questionnaire.

Desire for more children shows the expected direction of correlation; with those desiring to have more children showing negative correlation and those wanting to have no more children showing the expected positive correlation.

The dependent variable, current use of efficient method of contraceptive and knowledge of a family planning outlet are positively correlated at a level of .80. This is as expected since women who know where to go for their method of contraception are more likely to use them than those who do not know.

4.3.2 Correlation Between Travel Time to Source and the ----- Independent Variables. -----

Level of education again shows interesting correlation with travel time to source. No education and 1-4 years of education show positive correlation with travel time to source indicating that these two groups reported longer travelling times than those with 5-8 years and 9+ years of education, since these two levels show negative correlation with travel time to source.

Number of living children and age show negative correlation. Once again, this would tend to indicate that the older women with children use the closest sources to them mainly for child-spacing rather than for stopping childbearing while younger women who would be more educated might choose sources farther afield, in the urban areas. Another aspect that was found out in a study carried out in Kisumu is that

younger women show a reluctance to go to the same sources with older women of their locality and so they tend to use the sources outside this locality which would mean that they would report longer travelling times than their older counterparts.

(Ominde, et. al. 1983, pp.126-140).

Desire for more children shows the expected direction of correlation with those desiring to have more children showing positive correlation; indicating longer travel times and those desiring to have no more children showing negative correlation, indicating shorter travel time.

The dependent variable, current use of efficient method of contraception, shows negative correlation to travel time to source as expected, since the longer the travel time a woman reports, the less she is likely to use modern contraceptive methods.

Use of transportation to the family planning sources is negatively correlated to travel time to source indicating that those who use some means of transportation will tend to report shorter travelling time. Unfortunately, due to the

strong collinearity that was encountered during the trial regression runs, only one dummy variable of mode of transportation, namely, use of transport (TNSP) could be explored further, as the dummy variable walk had to be dropped from the regression model.

Practice.
4.3.3 Correlation Between Current Use of Modern Contraceptive Method and Selected Independent Variables.

The trend of correlation between current use of modern contraceptive methods and the explanatory variables is very similar to the one between the same variables and knowledge of a family planning outlet.

The correlation between levels of education and current use of modern contraceptives shows a rise from -.15 for those with no education, to .12 for those with 9+ years of education. As hypothesized, current use of contraceptives rises as the level of education increases. This would appear to agree with the KCPS report that showed a percentage increase from 11.7 for those with no education to 34.4 per cent for those with 9+ years of education (KCPS 1984 P.91). This relationship will be explored deeper using path analysis.

Number of living children shows positive correlation to current use of contraceptives. Just like the positive correlation with knowledge of a family planning outlet and the same argument of contraceptive use for child-spacing can be used in this case.

The next variable, work status, presents puzzling correlation which turns out to be negative for those currently working and also those who are not working. Once again, the only feasible explanation for this is that the respondents did not understand the concept of work as specified in the questionnaire.

Desire for more children shows the expected correlation with current use of modern contraceptive methods. Those desiring to have more children show negative correlation indicating the unlikelihood of use as compared to the positive correlation between current use and those desiring to have no more children.

Knowledge of a family planning outlet shows a strong positive correlation with current use of modern contraceptives just as was hypothesized. This supports the theory that a woman who knows where she can obtain her method of contraception is more likely to use this method than one who does not know.

In order to examine these relationships more closely, a more robust method of analysis is required. In the following section, path analysis will be used to examine the direction and strength of the exogenous variables on the endogenous variables. Once again the standardized beta values from the multiple regression will be used as path coefficients and both the full and trimmed models will be examined.

4.4 Findings and Interpretation of Multiple Regression.

The results from the full model are given by the following structural equations generated by the model:

$$\begin{aligned}
 \text{TTS} = & .065 \text{ NEDUC} + .0451 \text{ 1-4YRS} + .002 \text{ 5-8YRS} \\
 & (0.039) \quad (0.043) \quad (0.039) \\
 & - .025 \text{ NLVC} + .035 \text{ WMORE} - .030 \text{ WRK} \\
 & (0.005) \quad (0.026) \quad (0.013) \\
 & + .075 \text{ RURB} - .625 \text{ TNSP} \\
 & (0.033) \quad (0.051)
 \end{aligned}$$

$$\begin{aligned}
 \text{KFPO} = & - .184 \text{ NEDUC} - .130 \text{ 1-4YRS} - .135 \text{ 5-8 YRS} \\
 & (0.081) \quad (0.088) \quad (0.081) \\
 & + .008 \text{ AGE} + .018 \text{ NLVC} - .028 \text{ WMORE} \\
 & (0.003) \quad (0.011) \quad (0.055) \\
 & - .061 \text{ WRK} + .081 \text{ RURB} - .777 \text{ TTS} \\
 & (0.028) \quad (0.067) \quad (0.028)
 \end{aligned}$$

$$\begin{aligned}
 \text{CUSE} = & .723 \text{ KFPO} - .090 \text{ NEDUC} - .041 \text{ 1-4YRS} \\
 & (0.019) \quad (0.083) \quad (0.090) \\
 & - .056 \text{ 5-8YRS} - .029 \text{ AGE} + .081 \text{ NLVC} \\
 & (0.083) \quad (0.003) \quad (0.012) \\
 & - .029 \text{ WMORE} - .042 \text{ WRK} - .005 \text{ RURB} \\
 & (0.055) \quad (0.028) \quad (0.069) \\
 & + .25 \text{ TNSP} - .048 \text{ TTS} \\
 & (0.146) \quad (0.048)
 \end{aligned}$$

For the trimmed model that omits all paths that are not significant at table value of $F(1,3227)$ at .01 level = 6.63 for TTS, $F(1,3226)$ at .01 level = 6.63 for KFPO and $F(1,3224)$ at .01 level = 6.63 for CUSE, the equations are:-

$$\begin{aligned}
 \text{TTS} = & -.634 \text{ TNSP} + .073 \text{ RURB} - .043 \text{ 5-8YRS} \\
 & (0.050) \quad (0.031) \quad (0.024) \\
 \text{KFPO} = & - .784 \text{ TTS} + .078 \text{ RURB} - .061 \text{ WRK} \\
 & (0.028) \quad (0.067) \quad (0.028)
 \end{aligned}$$

$$\begin{aligned}
 & - .169 \text{ NEDUC} - .119 \text{ 1-4YRS} - .131 \text{ 5-8YRS} \\
 & (0.079) \quad (0.087) \quad (0.081)
 \end{aligned}$$

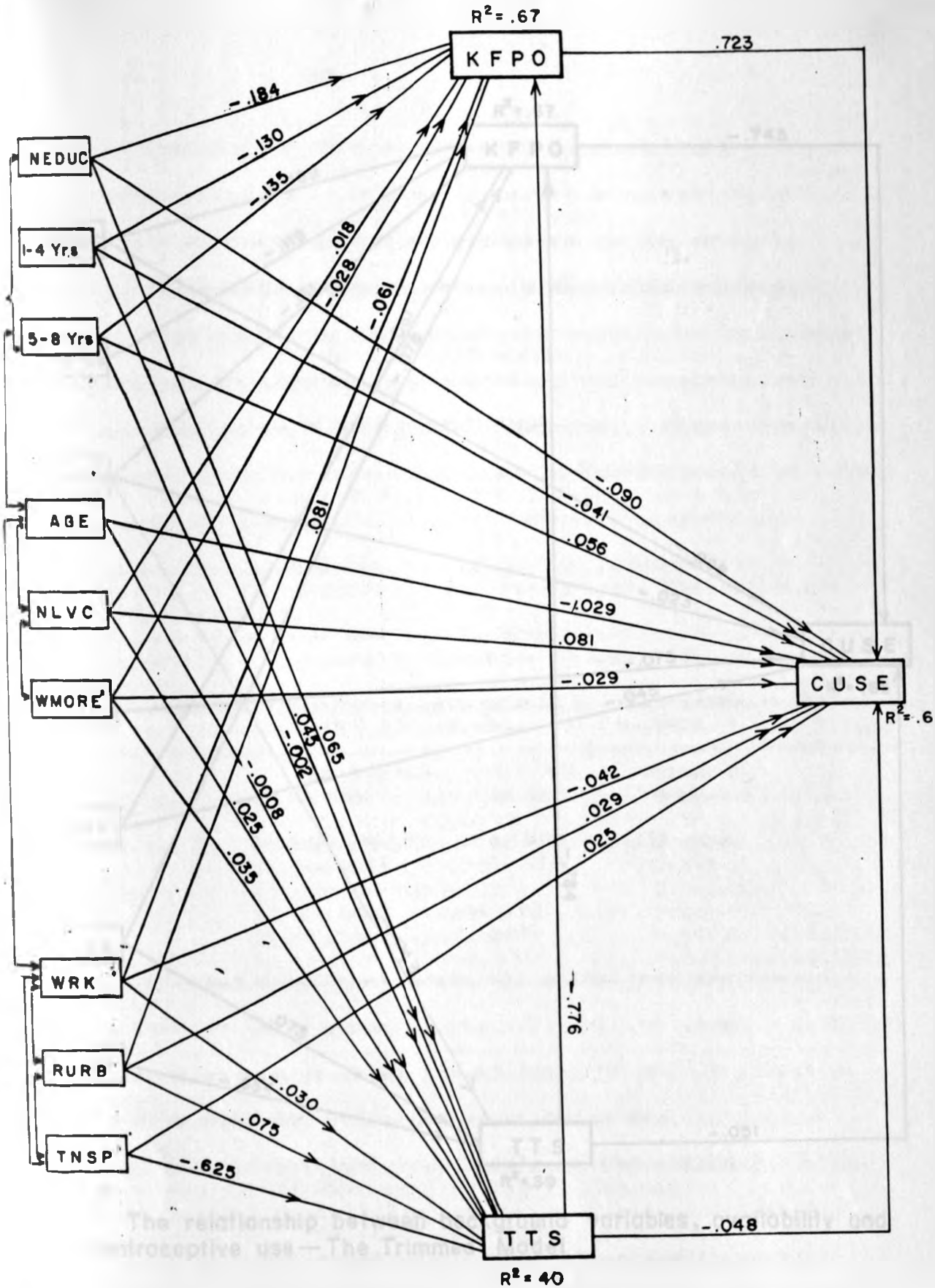


FIGURE 6 : The relationship between background variables, availability, accessibility and current contraceptive use —The full model

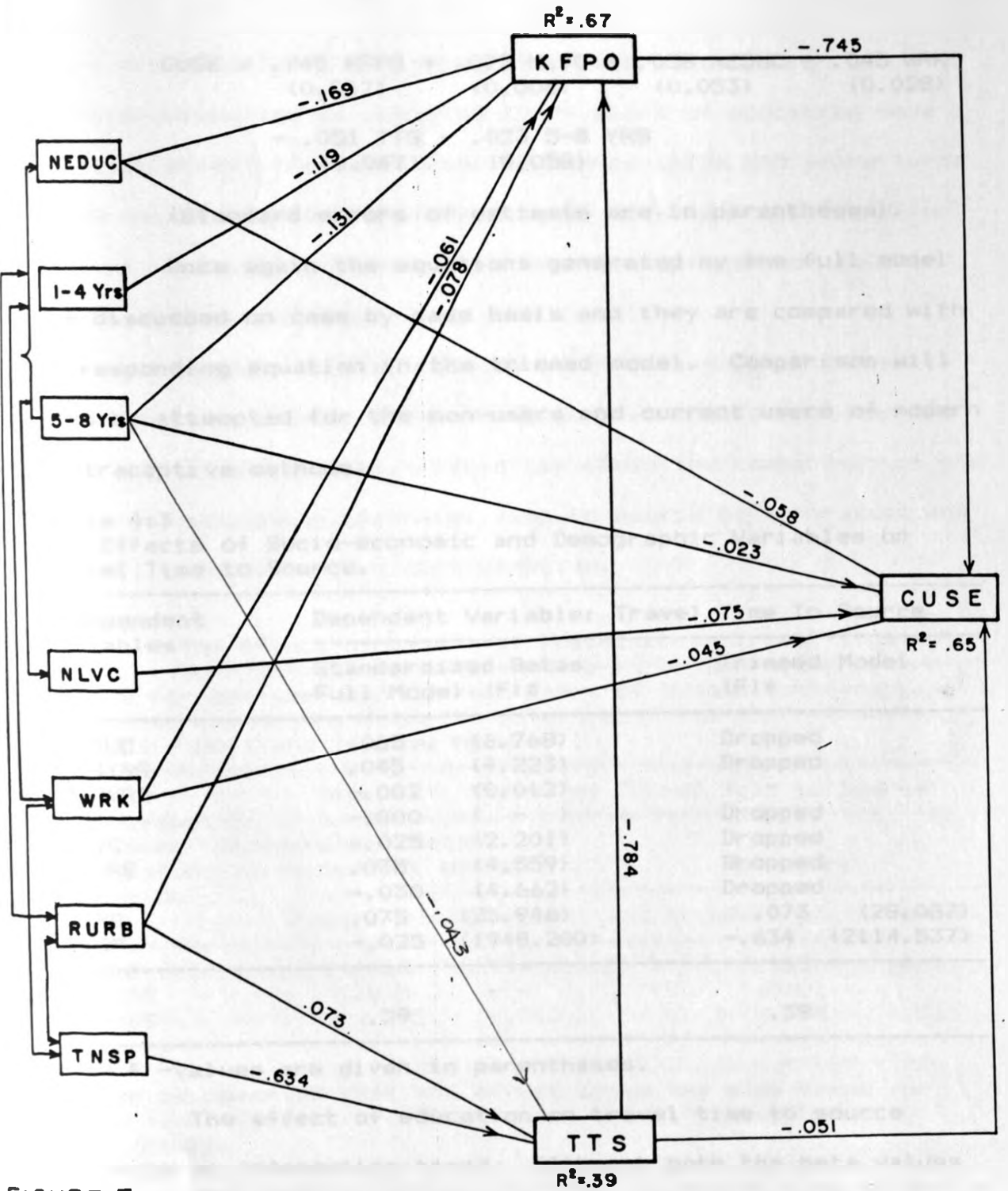


FIGURE 7: The relationship between background variables, availability and current contraceptive use—The Trimmed Model

$$\text{CUSE} = .745 \text{ KFPO} + .075 \text{ NLVC} - .058 \text{ NEDUC} - .045 \text{ WRK} \\
 (0.017) \quad (0.008) \quad (0.053) \quad (0.028) \\
 - .051 \text{ TTS} - .023 \text{ 5-8 YRS} \\
 (0.047) \quad (0.058)$$

(Standard errors of estimate are in parentheses).

Once again the equations generated by the full model are discussed on case by case basis and they are compared with corresponding equation in the trimmed model. Comparison will also be attempted for the non-users and current users of modern contraceptive methods.

Table 4:3 The Effects of Socio-economic and Demographic Variables on Travel Time to Source.

Independent Variables	Dependent Variable: Travel Time To Source	
	Standardized Betas Full Model (F)*	Trimmed Model (F)*
NEDUC	.065 (6.768)	Dropped
1-4YRS	.045 (4.223)	Dropped
5-8YRS	-.002 (0.012)	
AGE	-.000 (-)	Dropped
NLVC	-.025 (2.201)	Dropped
WMORE	.035 (4.559)	Dropped
WRK	-.030 (4.662)	Dropped
RURB	.075 (25.946)	.073 (28.087)
TNSP	-.025 (1948.200)	-.634 (2114.537)

Z		
R	.39	.39

*The F -values are given in parentheses.

The effect of education on travel time to source presents an interesting trend. Although both the beta values and calculated F -values are not large, the trend indicates positive effect for those with no education and those with 1-4 years of education but becomes negative for those with 5-8

years of education. This indicates that no education and 1-4 years of education as compared to 9+ years of education have a positive effect of travel time to source while 5-8 years turns to be negative. It is interesting to note that the trend for current users is the same as far as the non-users of modern contraceptive methods.

In both models, for users and non-users of modern contraceptive methods, the education trend holds both for the full and trimmed models. Table 4:4 shows the comparison of the effect of education on travel time to source for non-users and current users of modern contraceptive.

Table 4:4
The Effect of Levels of Education on Travel Time to Source for Non-user and Current Users of Modern Contraceptive Methods - Full and Trimmed Models.

Independent Variable: Level of Education	Dependent Variable: Travel Time to Source			
	Current Users		Non-Users	
	Full	Trimmed	Full	Trimmed
NEDUC	.065	-.043	.065	.061
1-4YRS	.045	-	.010	-
5-8YRS	-.002	-.043	-.048	-.063

It can be observed that the effect shows the same trend for both groups.

Age appears to have no effect on travel time to source for current users of modern contraceptives.

The effects of number of living children turns out to be negative contrary to the hypothesis. The same trend was also observed for the non-users but the latter showed a stronger negative effect. This agrees with other findings where family planning programme effort is either moderate or low (Mauldin and Lapham, 1984, pp.109-118).

Desire for more children for current users of modern contraceptive methods shows the expected direction of effect unlike that of the non-users. Those desiring to have more children show a positive effect as compared to those desiring to have no more children while this is negative for the non-users.

Work status shows a negative effect as it is hypothesised and this holds both for the users and non-users.

Urban residence shows a surprising positive effect and one of the strongest among these variables. The same trend is observed for the non-users.

The strongest overall effect on travel time to source is use of transportation (-.625) and this is stronger than for the non-users (-.527).

As a result of the weak paths that do not meet the specified statistical criteria, the trimmed model has only three variables and their calculated F-values shows that they are the most important variables in the model.

These variables explain about 40 per cent of the variation in an individual's travel time to source and although

the beta values are quite small, they are statistically significant at .01 F level.

For both the non-users and current users of modern contraceptive methods, however, use of transportation, urban residence and 5-8 years of education appear to be the most important paths.

The next set of equations show the results of the effect of socio-economic and demographic variables on knowledge of a family planning outlet. Table 4:5 presents the results of the full and the trimmed models.

With regard to the 9+ years of education, which is the reference category, all the levels of education show negative effect on knowledge of a family planning outlet. It is interesting to note that 1-4 years and 5-8 years of education show about the same effect while no education shows the largest negative effect.

When this is compared with non-users of modern contraceptive methods, the same trend is observed but for the current users both the beta and the F-values are greater and as a result all the three levels of education are retained in the trimmed model for current users while only two are retained in the trimmed model for the non-users.

Number of living children shows a weak effect in the expected direction and also desire for more children.

Table 4:5

The Effects of Socio-economic and Demographic Variables on Knowledge of a Family Planning Outlet.

Independent Variables	Dependent Variable: Knowledge of a family planning outlet			
	Standardized Betas			
	Full model *(F)	Trimmed model (F)		
NEDUC	-.184 (97.057)	-.169 (85.754)		
1-4 YRS	-.130 (64.619)	-.119 (55.474)		
5-8 YRS	-.135 (65.555)	-.131 (61.753)		
AGE	.008 (0.370)	Dropped	Dropped	
NLVC	.018 (1.696)	Dropped	Dropped	
WMORE	-.028 (5.122)	Dropped	Dropped	
WRK	-.061 (34.898)	-.061 (35.747)		
RURB	.081 (56.381)	.078 (52.797)		
TTS	-.777 (5715.139)	-.784 (5913.621)		
R	.67		.67	

*The F -values are given in parentheses.

The effect of work status shows an intriguing direction of effect with both those currently working and those not working showing a negative effect on knowledge of a family planning outlet contrary to what was hypothesized. It seems as if the women in the survey did not understand "work" as it was defined in the survey.

Urban residence, when compared to rural residence, shows a positive effect as is hypothesized, but although the same trend is observed for both the current users and non-users, the effect is statistically stronger for the latter group.

As is the case with the non-users, travel time to source shows the greatest effect on knowledge of a family

planning outlet and it is the most significant path in the model.

Only six variables remain in the model when it is trimmed. All the demographic variables have been dropped from the model, an indication that they do not have a strong effect on the dependent variable. The variables retained show insignificant changes in the trimmed model.

The variables explain about 67 per cent of a woman's variation in knowledge of a family planning outlet. This is the same percentage shown for the non-users of modern contraceptive methods and the strongest path in both is the use of transportation.

The last set of equations examine the effects of the socio-economic, demographic and social setting factors on current use of efficient methods of contraception. The results from both the full and the trimmed model are presented.

No education, when compared with 9+ years of education, shows a negative effect of $-.090$ and this is quite statistically significant, while 5-8 years of education shows a negative effect of $-.041$ when compared to 9+ years of education.

This trend is also observed in the effects of education on knowledge of a family planning outlet. It is worth noting that for travel time to source the trend is reversed with no education showing the strongest positive effect of $.065$ and 5-8 years showing a weak negative effect ($-.002$).

Table 4:6

The Effects of Socio-economic, Demographic and Social Setting Factors on Current Use of Efficient Contraceptive Methods.

Independent Variables	Dependent Variable: Current Use			
	Standardized Betas		Trimmed model (F)*	
	Full model (F)*			
NEDUC	-.090 (21.753)		-.058	(22.429)
1-4YRS	-.041 (6.234)		Dropped	Dropped
5-8YRS	-.056 (10.566)		-.023	(3.855)
AGE	-.029 (4.336)		Dropped	Dropped
NLVC	.081 (30.485)		.075	(51.280)
WMORE	-.029 (5.314)		Dropped	Dropped
WRK	-.042 (16.033)		-.045	(18.558)
RURB	-.005 (0.207)		Dropped	Dropped
TTS	-.048 (7.444)		-.051	(8.684)
KFPD	.723 (1392.273)		.745	(1799.790)
TNSP	.025 (3.121)		Dropped	Dropped

2

R = .65

*The F -values are given in parentheses. Table 4:7 on page 97 shows the comparison of the effect of education on travel time to source, knowledge of a family planning outlet and current use of efficient contraceptive methods. Age confirms the hypothesis of negative effect on current use of efficient contraceptive methods while desire for more children as has been hypothesised, shows a negative effect when compared to desire for more children. Knowledge of a family planning outlet is significant at .01 level. The most significant path is still knowledge of a family planning outlet.

Table 4:7

The Effect of Education on Travel Time to Source,

Knowledge of a Family Planning Outlet and Current Use of Efficient Contraceptive Methods.

Independent Variable:	Dependent Variables		
	TTS	KFFPO	CUSE
NEDUC	1.065	-.184	-.190
1-4YRS	.045	-.130	-.041
5-8YRS	-.002	-.135	-.056

There are three variables that were hypothesized to have no effect on current use; urban residence, travel time to source and use of transportation. The first one turned out to have a weak negative effect of -.005 while the second one showed a stronger effect of -.048 in the same direction. The third one showed a weak positive effect of .025 on current use of efficient contraceptive methods.

Knowledge of a family planning outlet shows the strongest path to current use in the expected direction (.723) and this increases further in the trimmed model (.745) which retains only six variables that meet the specified statistical criteria. The most significant change in the trimmed model is in the F-values which show that all these variables are significant at .01 level. The most significant path is still knowledge of a family planning outlet.

The variables explain about 65 per cent of a woman's variation in current contraceptive practice in both the full and trimmed models, with knowledge of a family planning outlet showing the overall strongest effect.

4.5 Conclusions.

Three important points emerge from the foregoing results. Firstly, they show the strength and direction of effect on contraceptive accessibility and use. Secondly, the results indicate how travel time to source, knowledge of a family planning outlet and use interrelate and thirdly, they results show the differentials in perception of the non-users and current users of modern contraceptive methods. Table 4:8 demonstrates the first two points.

One of the factors that demonstrate the first two points is level of education. The column on travel time to source shows that the effect decreases as education increases. This means that shorter travel time to source will be reported by those women with high levels of education and they will also perceive family planning outlets to be accessible than women in lower levels of education.

This confirms the close relationship between travel time and knowledge of a family planning outlet as the effect of education on the latter increases. The same trend is observed on the effect of education on current use of efficient contra-

The findings for travel time to source and knowledge of family planning outlet are summarized in Table 4:8

The Interrelationship Between Socio-economic, Demographic and Programme Effort Factors.

Independent Variables	Dependent Variables		
	TTS	KFPO	CUSE
NEDUC	.065	-.184	-.090
1-4YRS	.045	-.130	-.041
5-8YRS	-.002	-.135	-.056
AGE	-.025	.018	.081
NLVC	.035	-.028	-.029
WMORE	-.030	-.061	-.042
WRK	.075	.081	.029
RURB	-	-.776	-.048
TTS	-	-	.723
KFPO	-.625	-	.025
TNSP	-	-	-
R	.40	.67	.65

ceptive methods. This means that the women who report the longest travel time to source, as shown by their stronger positive effect of travel time to source, also have the least knowledge of a family planning outlet, as indicated by their weak positive effect on knowledge of a family planning outlet, and they are the least likely to use these sources for family planning services.

The strong negative effect on TTS of travel time to source and knowledge of a family planning outlet, indicates that

The findings for travel time to source and knowledge of a family planning outlet are consistent for both the current users and non-users of efficient contraceptive methods.

Age shows weak effect across the three dependent variables but the direction indicates that older women will find family planning outlets to be less accessible, have less knowledge of these outlets and be less likely to use them.

Work status does not appear give a consistent pattern across the variables and this might either be due to the fact that the respondents did not understand the concept of "work", as defined in the KCPS, or it would confirm the same inconsistency found in other countries where family planning availability is either moderate or low (Cornelius and Novak, 1983, pp.302-317).

It appears that the relationship between urban residence and higher contraceptive prevalence is due to more knowledge of a family planning outlet since from the findings, urban women still find their family planning outlets inaccessible. Urban residence shows a negative effect on current use, the path through knowledge of a family planning outlet, which is positive, shows that urban women have more family planning outlet knowledge which increases the use, but urban residence, per se, cannot explain a woman's current use of contraceptives.

The strong negative effect (-.776) of travel time to source on knowledge of a family planning outlet, indicates that

this factor depresses both knowledge and current use of contraceptives. It is only when this depressing effect is removed by use of transportation (-.625), that knowledge of a family planning outlet increases which in turn shows a strong positive effect (.723) on current contraceptive use. In other words, a woman who uses some form of transportation will tend to perceive family planning outlets to be more accessible and available. This argument holds for both users and non-users of modern contraceptives.

In this chapter, an attempt will be made to show how far these objectives have been achieved by first of all presenting the summary of the major findings with special reference to the hypotheses made in the study and secondly by showing how these findings impact on both population policy development and on family planning programme management. Lastly, areas of further research arising from the study and some of the methods of analysis will be presented.

2. Summary of the findings.

Two recursive models are developed in order to achieve the objectives of this study. The model presented in chapter three, enables the perception of non-users of efficient contraceptive methods to be measured. The second model is

CHAPTER FIVE

SUMMARY OF THE FINDINGS, POLICY AND PROGRAMME IMPLICATIONS.

5.1 Introduction.

The present study set out to achieve three objectives: The first to assess, at the micro-level, the availability and accessibility of contraceptive methods in Kenya.

The second objective to show the linkages between socio-economic and demographic factors, availability, accessibility and use of modern contraceptives and the last objective to assess the importance of the above factors both on population policy development and on family planning programme management.

In this chapter, an attempt will be made to show how far these objectives have been achieved by first of all presenting the summary of the major findings with special reference to the hypotheses made in the study and secondly by showing how these findings impact on both population policy development and on family planning programme management. Lastly, areas of further research arising from the study and issues on the methods of analysis will be presented.

5.2 Summary of the Findings.

Two recursive models are developed in order to achieve the objectives of this study. The model presented in chapter three, enables the perception of non-users of efficient contraceptive methods to be examined. The second model in

chapter four examines the effects of the socio-economic, demographic and social setting factors on contraceptive accessibility, availability and use.

In both models, level of education indicate that it is an important factor in a woman's perception of availability and accessibility of contraceptives. The level of education also plays a role on the decision to adopt or not to adopt contraception.

For the non-users of efficient methods, the effect of education on travel time to source decreases as the level of education increases. When no education is compared to 9+ year of education, it shows a positive effect of .065 while 1-4 years show an effect of .010 in the same direction but 5-8 years of education shows a negative effect. (-.048). This means that those with no education are likely to report longer travel time to source than those with higher education. This shows that there are differentials by level of education in the perceptions of the contraceptive accessibility for the non-users of efficient contraceptive methods. It is worth noting that those with 5-8 years of education are likely to report shorter travelling time as shown by their negative effect.

When this effect is compared to the effect of education on travel time to source for the current users of efficient contraceptive methods, the same trend is observed but with no education showing the same effect (.065) for both groups and 5-8 years of education showing negative effect.

The trend in the effect of education shows that the perceptions of the non-users confirms the actual differentials in accessibility observed for the current users of efficient contraceptive methods.

The same consistence is observed in the effect of education on knowledge of a family planning outlet for both groups. While the trend shows that all the levels of education will tend to report less knowledge of a family planning outlet than those with 9+ years of education, it also shows that knowledge increases as the level of education increases for both groups.

while no education shows a negative effect of $-.108$ for the non-users this is at a much greater magnitude ($-.184$) for the current users. For the 5-8 years of education this decrease to $-.029$ for the non-users and to $-.135$ for the current users. This proves the fact that education has an impact on knowledge of a family planning outlet for the current users more than on the perceptions of the non-users.

The other factor that presented some interesting findings is age. The study had hypothesized that age has a negative effect on knowledge of a family planning outlet. This is confirmed for the non-users but for the current users it turns out to be positive. This might be due to the use of family planning sources more for child-spacing than for stopping childbearing. This is strengthened by the positive effect of number of living children for both the current users and non-users.

Travel time to source has the strongest negative effect on knowledge of a family planning outlet for both the current users and non-users $-.807$ and $-.777$ respectively. This confirms findings from other studies (Cornelius and Novak, 1983; Pebley and Brackett, 1982; Brackett, 1980) that the farther away a woman is from a source the less likely she is to know that source or to use it for family planning purposes.

Travel time to source depresses knowledge of a family planning outlet and the probability of use for the non-users and it is also a depressing factor on knowledge of a family planning outlet and use for those who are currently using efficient methods of contraception.

The findings for the current users of efficient contraceptive methods show that there is a close relationship between travel time to source, knowledge of a family planning outlet and current use of contraceptives. This is demonstrated clearly by the effect of education across the three dependent variables. The effect of education on travel time to source decreases as the level of education increases indicating that women with higher levels of education find family planning sources more accessible than those with lower or no education.

This is related to effect of education on knowledge of a family planning outlet which shows that all levels of education show negative effect when compared to 9+ years of education, but this effect decreases as education increases.

This relationship shows that those women who have lower levels of education not only find family planning source inaccessible, they also have less knowledge of these sources.

An examination of the effect of education on current use shows that this increases as the level of education increases from .071 for those with no education to .102 for those with 9+ years of formal education.

The findings show that socio-economic, demographic and social setting factors impact upon availability, accessibility and use of contraceptives, with social setting factors showing the strongest impact followed by the socio-economic factors, and lastly the demographic factors.

The interrelationship between travel time to source, knowledge of a family planning outlet and use of efficient methods of contraceptives has also been shown. Travel time to source depresses knowledge of a family planning source, as shown by its strong negative effect (-.776), and also depresses current use (-.048). Knowledge of a family planning outlet increases the likelihood of use, as is indicated by its strong positive effect on use (.733).

An important finding is that there are differentials in travel time to source, in knowledge of a family planning outlet and in contraceptive use. The implications of these findings on population policy development and on family planning programme management is dealt with in the following section.

5.3 Implication of the Findings both on Population Policy

Development and Family Planning Programme Management.

In 1978, there were over 505 family planning clinics jointly ran by the FPAK and the government. It was estimated that the average land area per clinic was 1,127 square kilometres for all Kenya (Brackett, 1980, p.6). At the same time, only 20 per cent of family planning users lived near an outlet. By 1984, when the KCPS was carried out, this picture had improved only slightly. There are, at present, about 651 family planning clinics including Service Delivery Points (SDPs), which would make the average land area per clinic only slightly lower than the 1978 figure. At the time the KCPS was carried out, 26 per cent of the users reported travel time of less than 30 minutes, 22 per cent said it took them 30-59 minutes while 48 per cent said the trip took them an hour or more (KCPS, 1984, p.105). Clearly, most Kenyans still need to travel great distances to obtain family planning services. This is also explained by the depressing effect of travel time to source and knowledge of a family planning outlet.

While knowledge of modern contraceptive methods is almost universal in Kenya, knowledge of where these methods can be obtained is not widely spread. In the KCPS, only 48 per cent of the non-users of modern contraceptive methods said they knew where they could go if they needed family planning services. This is again shown by the differentials in the

effects of socio-economic and demographic factors on knowledge of a family planning outlet for both current users and non-users.

There is need for more concerted effort on information, education and communication so that those in need of family planning supplies and services can perceive them to be available as well as accessible. At the present time, estimates from the 1979 census show that over 46 per cent of Kenya women are in their childbearing ages, yet by 1980, there were only 783 family planning field educators (Women of Kenya, Statistical Data Sheet, 1985).

Level of education has been found to be an important factor in determining knowledge of modern contraceptive methods, where these methods can be obtained from, as well as use of these methods. Women with more than nine years of education appear to be so highly motivated to use efficient methods and travel time to source does not depress this motivation as it does among other groups. If family planning outlets were perceived to be within reach of every couple that needed the service, these differences would be minimized. One way that this can be done is by having more field workers and community-based distribution points of effective means of contraception that do not need prescription. There is also need for information, education and communication geared towards the male population so that the prevalence of such cheap and efficient methods, such as condoms, can be raised.

There is also evidence from the interrelationship between number of living children, knowledge of a family planning outlet and current use, that shows that women might be using these sources more for maternal and child care services and not for family planning. There is need to see how this amalgamated programme can give effective services to both maternal and child health care as well as to family planning services.

The analysis of non-users of modern contraceptive method shows that number of living children has a positive effect on knowledge of a family planning outlet. This indicates that women of higher parity know of these sources for maternal and child health care but they choose to use ineffective methods of contraception. This tends to show that either cultural, religious or lack of proper information makes women use ineffective methods.

Adequate infrastructure, especially in the rural areas, would enable women to use transportation and this in turn would enable them to perceive family planning sources to be more accessible. At present, about 47.6 per cent of rural non-users say that they would have to walk to their sources while 51.6 per cent would use transportation. At the same time, over 65 per cent of the rural non-users report that it would take them an hour or more to reach their source. For the short-term plan, community-based distribution approach might alleviate this problem, but opening up the rural areas is the only long-

term solution so that couples can get to their preferred sources within a time that does not depress their motivation to use family planning sources.

5.4 Further Research and Issues on Methods of Analysis.

The KCPS sample showed that among the non-users of modern contraceptive methods who knew of at least one modern method, only 48 per cent knew where they could go for family planning services and supplies. Since this group contains potential users of efficient methods, it is important to investigate their intention of use in the future and for there to be concerted effort in providing information and education for those with future intentions to use efficient methods so that they perceive their preferred outlets as both available and accessible.

Another area that requires further research is lack of accessibility as a reason for non-use. In the KCPS only 24 per cent of the users mentioned inaccessibility, as measured by travel time, as a constraint to use. This masks the extent to which lack of accessibility influences the decision to adopt family planning. Novak, et. al (1983, pp.302-317) found that there exists a definite distance-decay in contraceptive prevalence rates among women who lived farther from an outlet. Most individuals may not consciously be aware that this fact influences their contraception decision. While the present study has shown that travel time to source has a depressing

effect on both knowledge of a family planning outlet and on current use of efficient contraceptives, a more detailed analysis on behaviour, namely, of the proportion of users among all women in need of family planning at increasing distances from the source, would provide programme administrators with an optimal distance estimates that could assist in the placement of method outlet with the target population.

The present study has examined current use of efficient methods of contraception regardless of whether they are supply or clinical methods. The constraints of users of these two methods are quite different. Clinical method users might travel farther than supply method users, but they would only do it once or several times over a long period of time, so that travel time might not be such a constraint as it would be for the supply users who need to get their supplies at regular intervals. The perceptions of supply method users and those of clinical method users, on accessibility, need to be investigated.

While travel time to source has been recognized as the best measure of accessibility (Rodriguez, 197, pp. 100-115) Contraceptive Prevalence Survey data on accessibility is subjective in nature. This means that personal measures of travel difficulties may be influenced by independent attitudinal biases of each individual's past travel experience and present attitude towards family planning. A respondent's

familiarity with the source of family planning methods may influence estimates of overall travel effort. The attitudinal biases that influence perceived accessibility should be adequately measured using better indices of the respondent's familiarity with family planning outlet, reason for outlet preference and utilization and constraints of multiple purpose source.

An interesting finding of the present study is the effect of number of living children both on knowledge of a family planning outlet, for current users and non-users, and on current use of efficient contraceptive methods. There is need for further research to be done on the personnel-client relationship especially on the time and energy allocated to family planning services, the accuracy and relevance of information provided to potential clients and the follow-up that is provided.

The role of men in family planning is an area that has been neglected since the inception of the national family planning programme. The only up-to-date information available are perceptions of currently married women currently using traditional methods in the KCPS on their husbands attitudes towards family planning. Less than half of the sample said their husbands approved of family planning and about 19 per cent said they disapproved. Of interest is the 25.1 per cent who said they did not know their husbands' attitudes towards family planning. This indicates that ambivalence towards

family planning still exists as far as Kenya men are concerned and research on this would shed some light on the reasons for this ambivalence.

As stated in the first chapter, studies of family planning are quite recent and methods of analysis are still being refined. The main method of analysis used in this study is path analysis and while this technique is useful in helping to sketch the broad outlines of the inter-relationships between variables such as the ones considered here, it cannot yield a full understanding of how these variables are interconnected. To achieve this, additional techniques such as Log Linear and Multiple Classification Analysis, which would enable examination of the data for interaction, are needed. The broad outlines of the main effects shown by path analysis give a basis from which further, more detailed and typically more limited, analyses may depart. This might enable analysis to be carried out for such issues as the probability of use for the non-users for the different socio-economic and for demographic groups.

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