

**"DEMAND FOR ANTE-NATAL CARE"**

*In Nairobi's Slum Areas*

By

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*Dissertation submitted to the department of Economics, University of Cape Town, in Partial fulfilment of the requirements for the degree of Masters in Health Economics*

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**This research paper is my original work and has not been submitted for examination in any other university.**

Signed by candidate

JOSEPH THAIRU WAMUKUO

**This research paper has been submitted for examination with our approval as university supervisors.**

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*- Joseph T. Wamukuo*

## ABSTRACT

This paper studies the factors influencing the demand for ante-natal care in two of Nairobi's slum areas, namely, Kibera and Mathare. Antenatal care is important as its absence / underprovision means higher incidences of both maternal and infant mortalities. On the other hand proper ante-natal care means improved well-being of both mother and child. These two groups constitute over 70% of Kenya's population. For any economic and social development programmes to succeed, there is need to give mother and child special attention.

The factors influencing the demand for ante-natal care could be grouped into three major categories; socio-economic (age, marital status, income etc.), facility (quality of care) as well as policy (user-fee) variables.

The data for the analysis was obtained by means of a household survey conducted in Kibera and Mathare. A two stage sampling procedure was used for the data collection. This involved first, listing of all clusters from which a random selection of clusters to be studied was done and secondly, the households were drawn by a random sample within each of the selected clusters.

The principal finding of the analysis is that both monetary and non-monetary variables such as income, user-fee, drug cost, education level, time costs and perceived quality of service was the most important determinants of the demand for ante-natal care among the women from the slum areas, while others such as occupation, household size and religion are rather insignificant. The former should be the main targets of the policy makers if their policies are to have any impact on the demand for ante-natal care.

It is also shown that other variables such as travel time and user-fee if varied could influence demand for ante-natal care services. User-fee had a negative sign, and household income had a positive sign as hypothesised while consumption/ expenditure and travel time both positive signs, contrary to priori expectations.

A surprising finding from the study is that household head's education and occupation had negative relationship with demand for ANC contrary to what had been hypothesised, while variables such as occupation, religion and household size had insignificant effect on the demand for ANC

Both elasticity coefficients for the two price variables (travel and money) are quite low and so any change in either travel time or money price would only have a negligible effect on the demand. The income elasticity had a more significant coefficient, indicating that a change in income would result in a substantial change in the demand for the ante-natal care. Income would therefore be a more suitable target for the policy makers aiming at influencing the demand, as opposed to distance and user-fees.

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## INTRODUCTION

### 1.1 BACKGROUND

Health and economic growth are both strongly interrelated, in the sense that health can strongly influence economic growth and vice versa. Health is a significant component of human capital, in that investing in health bears direct affects on productivity per unit time and consequently on economic growth. Individuals who are healthy are more inclined to work harder, more intensely and efficiently. Moreover, better health also increases expected duration of productive years (Behrman, 1993). This chapter outlines the background of health services in Kenya, provision of which is important for Kenya's socio-economic development, and also highlights the plight of women world-wide lacking access to proper health care.

Kenya government has been at the fore front of placing human welfare in its development process as shown in the country's development plans and other policy documents, for it regards human development as both a goal of social and economic activities as well as the mean of achieving that goal. Like other developing countries, it has been spending considerable amount of resources on health care.

The recurrent expenditure on health rose from K£ 52.8m in 1980/81 to K£ 79.6m (1985/86) to K£ 128.8m (1990/91) and to K£ 350.5m in 1996/97 (Republic of Kenya, 1979-97). There has also been tremendous growth of health facilities; the dispensaries by 275%, health centres by 212% and hospitals by 107%, from 1963 to 1995 (see table 1.1).

**Table 1.1. Growth of Health System in Kenya : 1980-1995**

	1980	1989	1991	1995
Doctors	1691	3266	3457	4558
Registered Nurses	6692	4712	5664	6719
Clinical Officers	1681	2534	2665	4558
Health Institutions	1554	2113	2346	3281
Hospitals	216	264	277	277
Health Centres	24	294	357	536
Sub Health Centres & Dispensaries	1087	1555	1712	1904
Hospital Beds & Cots	27691	32534	33926	33926

Source: Ministry of Health, Health Information System

Nairobi is served by a wide range of health care providers, these include the government through the provincial medical office (PMO), private, non-governmental agencies (NGOs), Nairobi City Council (NCC), traditional practitioners and the Kenyatta National Hospital (KNH). In total there are about 174 facilities, excluding the individual private practitioners (see table 1.2).

**Table 1.2. Distribution of Health Facilities by Provider and Category**

<b>Distribution of Facilities: All Providers</b>								
Category of Provider	Hospital	HC With Beds	HC With No Beds	Mater/ Nursing	Dispen-Sary	Clinic	Other	Total
NCC	1	8	12	-	8	20	2	51
PMO	6	6	11	-	15	-	-	38
Parastatal	1	2	-	-	6	-	-	9
Mission	1	-	-	2	17	-	-	20
NGO/Private	18	-	-	17	17	4	-	56
<b>TOTAL</b>	<b>27</b>	<b>16</b>	<b>23</b>	<b>19</b>	<b>63</b>	<b>24</b>	<b>2</b>	<b>174</b>

Source: Health Information System (HIS)

In Nairobi, maternal child health services including ante-natal care, post natal care, family planning and immunisation are offered in majority of these facilities (see table 1.3). The NCC has 20 MCH/FP clinics while the PMO has none. This study however focuses only on ante-natal care.

Table 1.3. Service by Type of Facility

SERVICE BY TYPE OF FACILITY								
Type of Facility	NCC Facilities				PMO Facilities			
	Providing Curative	%	Providing P/P Services	%	Providing Curative	%	Providing P/P Services	%
HC/Beds	8	29.6	8	17.8	2	8.0	1	14.3
HC/No Beds	12	44.4	12	26.7	5	20.0	2	28.6
Dispensaries	7	26.0	5	11.1	7	28.0	4	57.1
Clinics	0	0.0	20	44.4	11	44.0	0	0.0
<b>TOTAL</b>	<b>27</b>	<b>100</b>	<b>45</b>	<b>100</b>	<b>25</b>	<b>100</b>	<b>7</b>	<b>100</b>

Source: Health Information System (HIS)

Despite the great effort on the part of the government, there is still great concern about an alarming trend in Kenya that few pregnant women are having medical evaluations during their pregnancy, with only 50% receiving adequate ante-natal care even in areas where facilities are available ([KDHS] 1989, 1993). This is very critical considering that even a presumably normal pregnancy during the whole ante-natal period may end up complicated, and in some instances result in fatality.

It has been noted that majority of women don't value greatly the need for ante-natal care (Mcintyre, 1981), and it is noted that complications of pregnancy and childbirth are the leading cause of premature death and disability among women in developing countries. Each year, nearly 600,000 women world-wide, die of maternal causes, even though techniques for averting almost all such deaths have been available for generations. Also, high fertility rates in developing countries put women at risk repeatedly (Maine *et al.*, 1996).

Most maternal deaths (55%) occur in Asia which accounts for 61% of the world's births, and Africa with 20% of the world's births, accounts for 40% of all maternal deaths. The developed countries on the other hand, with 11% of all births, have less than 1% of total maternal deaths. The result is that about one woman in 16 in Africa will die of maternal causes, compared to one woman in 4,000 in Northern Europe (Maine *et al.*, 1996).

In developing countries, the maternal mortality ratio ranges from just under 200 per 100,000 live births in Latin America and the Caribbean to over 870 per 100,000 in Africa, with the highest ratios of over 1000 per 100,000 live births in Eastern and Western Africa. The risk of pregnancy-related deaths is 100 times greater in sub-Saharan Africa than in Europe (WHO, 1996)

## 1.2 THE RESEARCH PROBLEM

As noted above, Nairobi has a wide range of health service providers, both public and private, including a large number of doctors in private medical practice. By 1992, the facilities numbered about 174 and the government continues to encourage both the private sector and NGOs to increase health care provision given the rising population expected to be over 2.2 million by the year 2000. At the same time, among the urban population, it is estimated that 47% live in either slums or near slum areas (Kenya's Programme of Action for Children, 1992).

The Kenya government recognises that health is a basic right and a key requirement for the country's success in attaining rapid socio-economic development. For this reason the government is always in the forefront of placing human welfare in its development process.

Despite the government's effort in health care delivery as well as the relatively impressive figures which indicate an increase in the utilisation of ante-natal care services, a lot is still left to be desired especially given that results included single ante-natal visits. In Nairobi where the facilities offering the services are quite numerous, those utilising the ante-natal services 'fully' are still very few (KDHS 1989).

Various studies have been done on demand for health services e.g.(Ndele, 1988; Mwabu *et al*, 1993; Njaramba, 1994), have either covered demand for general health services or maternal health services outside Nairobi. The question of how the women in the slums areas respond to the availability of health services thus remains unaddressed.

Given that the factors influencing the demand for ante-natal care by the women in the low-income urban areas (slums) are still unknown, planners are unable to plan adequately for such services, and hence policy makers have inadequate information on which to base their decision making.

This study hopes to generate some useful information that may prove handy to planners and policy makers as they strive to provide ante-natal care more effectively and efficiently.

### **1.3 OBJECTIVES OF THE STUDY**

The aim of this study is to establish the main factors that affect demand for ante-natal services in Nairobi's slum areas. The specific objectives are:

1. To identify the factors that determine pregnant women's utilisation of ante-natal services;
2. To estimate the effect of the socio-economic characteristics and health facility specific attributes identified in (1) on the individual woman's utilisation of ante-natal services;
3. To discuss policy implications of the study results; and
4. To make policy recommendations for improving ante-natal care services delivery in Nairobi's slums.

#### 1.4 JUSTIFICATION OF THE STUDY

Though this study may not provide unequivocal answers to the question of the determinants of demand for ante-natal care due to its limited scale and scope, it is expected to provide some further insights into this issue.

By determining the main factors that influence the demand as well as their magnitudes, the results can guide health policy makers on the causes of the current demand levels and the reason for their fluctuations.

With the understanding of the demand determinants, ante-natal care delivery can be improved by taking into consideration the factors that the consumers are most sensitive about. This would in turn help in a more effective allocation of the scarce health resources.

The study will shed light on the role the government could play in boosting delivery and demand for ante-natal care. This is possible since the demand model can be used by these health planners/policy makers in predicting the possible consequences of various policy actions, especially on ways of raising utilisation levels by influencing these demand determinants.

Finally it is also hoped that the findings of the study will contribute to the literature on demand for ante-natal care for future use by other researchers.

## 1.5 ORGANISATION OF THE REMAINING CHAPTERS

The rest of this paper is organised as follows: Chapter two defines ante-natal care and maternal mortality and then outlines the provision of former, as well as the levels of the latter both locally and globally.

Chapter three presents the literature review. It first reviews the general literature on demand for health services with emphasis on ante-natal care and also specific literature on the same in Kenya. The chapter ends with a brief comparison of current study with the previous ones.

Chapter four describes the analytical framework used to estimate the demand for ante-natal care services, and also defines the variables used to estimate the demand function.

Chapter five outlines the data collection methodology, describes the study area, the sampling frame, sampling procedure, nature of interviews and finally pointing out the data collection limitations and reliability.

Chapter six presents in detail the descriptive statistics, as well as the regression results (parameter estimates) and concludes by discussing various policy implications of the results obtained.

Chapter seven outlines the conclusions of the study and makes a number of policy recommendations based on the study findings and also makes suggestions for further research.



**ANTE-NATAL CARE AND MATERNAL MORTALITY****1.0 INTRODUCTION**

This chapter deals with the definitions of antenatal care and maternal mortality and also outlines the provision of ante-natal care as well the maternal mortality levels both in Kenya and globally.

**1.1 DEFINITION OF ANTE-NATAL CARE SERVICES**

Ante-natal care is part of the maternal health services that are offered to pregnant women, with the aim of improving the health of both mother and child. Maternal health services in the context of primary health care are based on the concept of informed choice, and include education on safe motherhood, ante-natal care that is focused and effective, maternal nutrition programmes, adequate delivery assistance that avoids excessive recourse to caesarean sections and provides for obstetric emergencies; referral services for pregnancy, childbirth complications; post-natal care; family planning and Immunisation (Derose, 1995).

Pregnancy is usually a very normal, healthy time for a family, but problems can occur that could be prevented by a routine visit to a health care provider. Anaemia (iron deficiency) and urinary tract infections are just two of the major causes of complications in pregnancy which can be prevented with regular ante-natal care. Ante-natal care is therefore one factor that can increase the likelihood that the mother will have a healthy baby.

Routine tests on the pregnant women, called "ante-natal care," are designed to enhance the health of the mother and the infant. Many diseases and conditions can be identified and addressed prior to delivery. Early identification can make a

profound difference both to the mother and child in terms of survival. Research has shown that a woman who does not have prenatal care is more likely to have her infant or herself die (Derose, 1995).

The objective of the ante-natal care is to facilitate a normal pregnancy, safe delivery and a healthy childhood. Problems can be anticipated and prevented or dealt with early. Disorders can be identified early for timely action through closely supervising the course of pregnancy to ultimately achieve satisfactory delivery of a healthy baby. It has been established that good ante-natal care reduces the risks of maternal mortality by 17 fold, perinatal by 6 fold and of low birth weight by 3 fold (Ebrahim *et al*, 1988).

Ante-natal visits also provide time for the mother to ask questions and gather information on exercise, diet, medications, and how her baby is developing. The entire family can be included in these visits. Mothers are normally advised not to risk their future health and that of their child by delaying their prenatal care, by choosing a health care provider as early in the pregnancy as they can.

### **Task Related Activities (Ebrahim *et al*, 1988).**

#### ***How many ante-natal visits are necessary ?***

Ideally a pregnant woman should be seen once every month up to the 28th week and then fortnightly up to 36<sup>th</sup> week and then weekly up to delivery. They should be seen more often if there are any abnormalities, any suspected illnesses or disorders.

### ***Supervision of the nutrition of the pregnant woman.***

The woman should be over 40 kg in early pregnancy, and should gain at least 1.25 kg in mid pregnancy and at least 2.5 kg in late pregnancy, for under-nutrition of the mother before and during pregnancy is a common cause of low birth weight. A large proportion of low birth weight in developing countries is due to under-nourishment in foetal life.

Anaemia is also common in pregnancy, especially if the mother is carrying twins. If not prevented, the growth of the foetus may suffer. If the mother happens to suffer haemorrhage, then the existing anaemia may be a risk to her life.

### ***Ascertaining adequate growth and well-being of the foetus.***

The growth of the foetus can be assessed by measuring the abdominal girth and the fundal height at consecutive visits. Foetal movements (kick counts) give an indication of the well-being and vitality of the baby.

### ***Prevention of infection in the mother.***

Neonatal tetanus is the second most important cause of deaths of new-borns after low birth weight. Tetanus is also an important cause of maternal mortality. It can easily be prevented by immunising the mother before or after pregnancy.

### ***Checking for pre-existing disorders.***

There is need to enquire about previous illnesses such as fits, tuberculosis (TB), previous surgery for gynaecological or obstetric reasons or other conditions and also about hypertension, anaemia and diabetes. These tend to be more critical during pregnancy, and need to be curbed before early in the pregnancy.

***Checking for the disorders of pregnancy.***

Swelling of ankles, sudden increase in weight should be noted as they indicate the retention of fluid and are major signs of toxæmia pregnancy. Diabetes may be pre-existing or become apparent in pregnancy.

***Checking for presentation/abnormality of lay in the foetus.***

This is important for it determines whether a woman will have a normal delivery or not if not rectified, this helps avoid excessive recourse to caesarean sections.

***Identification of the “at risk mother”***

These are mothers whose probability (risk) of death or complication in the baby or mother or both is higher than otherwise. Ante-natal care should identify and anticipate risk factors in advance. The risk factors include: very young mother, woman in her 5<sup>th</sup> pregnancy and above, short woman (<150 cm), late pregnancy, history of still births, short birth intervals and social problems.

***Recognising danger signals in pregnancy.***

These are indicators which warn of future trouble and should be recognised as the lives of the mother and child are always at risk. These are better identified early and treated rather than dealing with resultant complications that may arise. These include: vaginal bleeding, persistent abdominal pain, chronic headaches, swelling of ankles, severe and persistent morning sickness, leakage of water from womb and stoppage of foetal movements.

### **Family life Education.**

Objective is to both impart knowledge and also prepare mothers for their future roles, such things as need for long enough birth interval, methods of feeding the baby are taught.

### **Maintaining records..**

Both individual case notes, charts of clients and clinical records for decision making both clinical and administrative respectively. Accurate records imply accurate decisions and also with absence of initial clinician someone else could make valid decisions.

#### **2.2.1 ANTE-NATAL CARE SERVICES IN KENYA**

Maternal and Child health and family planning (MCH/FP) programme was started in Kenya in 1974, with ante-natal care being introduced into the programme towards the end of the 1970s. The primary health care (PHC) programme was officially embraced as a health strategy in 1982 with ante-natal care being an integral part of it (Republic of Kenya, 1985).

Ante-natal care has been a component of PHC since the 1940s but in Kenya it was incorporated in the 1970s, a decade after independence. There have been a number of definitions of primary care. The World Health Organisation (WHO) described primary care in its 1978 *Alma Ata Declaration* thus:

*"Primary Health Care is essential health care made universally accessible to individuals and families in the community by means acceptable to them, through their full participation and at a cost that the community and country can afford. It forms an integral part both of the country's health care system of which it is the nucleus and of the overall social and*

*economic development of the community...It is the first level of contact of individuals, the family and community with the national health system bringing health care as close as possible to where people live and work and constitutes the first element of a continuing health care process... Primary Health Care addresses the main health problems in the community, providing promotive, preventive, curative, supportive and rehabilitative services accordingly" (WHO, 1978).*

In line with global realisation of the need for safe motherhood, Kenya has not looked back since adopting PHC and its commitment has been demonstrated in its adoption of various policies such as :-

- World Health Assembly in 1977 of '*health for all by year 2000*'.
- The *Alma-Ata declaration by the international conference in 1978 on health for all* through PHC as the strategy.
- World health assembly of the *global strategy for all by the year 2000* in 1981.
- Participation in world summit for Children in ratification of the Convention on Rights of the Child in 1990, the summit goals included:
  1. Between 1990 and 2000, reduce infant mortality by one third to 50 per 1,000 live births whichever is less.
  2. Between 1990 and 2000, reduce under five mortality by one third to 70 per 1,000 live births whichever is less.
  3. Between 1990 and 2000, reduce maternal mortality by one half. Little is known about current magnitude of maternal mortality in Kenya.

### **2.2.2. UTILISATION OF ANTE-NATAL CARE SERVICES IN KENYA**

In Kenya many women do not attend ante-natal care clinics due to ignorance (lack of awareness) or lack of access to health facilities (KDHS 1989). The survey noted that even in areas where facilities are available such as in Nairobi, still less than 50% receive adequate ante-natal care. This is very critical considering that even a presumably normal pregnancy during the whole ante-natal period may end up as an emergency at the time of delivery, a fact that number of women are not aware.

Recent survey results indicate that there has been an increase in the demand for ante-natal services and other maternal related health services. The KDHS conducted in 1993 for example indicated impressive utilisation of ante-natal care services, with 64% of the mothers who had given birth at that period as having made at least 4 ante-natal visits, another 27% made 2-3 visits. Overall 95% of the mothers that gave birth in the 5 years period prior to the survey received the care. The survey also indicated that 56% received ante-natal care before the sixth month of the gestation period.

According to the KDHS survey, there was an increase in the tetanus toxoid injections administered which is an indication of an increase in the utilisation of ante-natal services. These injections are given to expectant mothers for prevention of neonatal tetanus as they confer immunity on the new born babies against the fatal disease. Kenya's goal is to achieve 100% access in urban areas and about 60% in the rural areas (Republic of Kenya, 1992).

For over two decades now, Kenya government has been implementing a concerted family planning policy, and this has borne fruit as population growth rate fell from 3.8% to 3.6% per annum from 1979 to 1989, while the fertility rate also fell from

6.6 to 4.5 in urban areas and 8.1 to 7.1 in rural areas. The use of contraceptives in family planning (FP) rose from 7% (1978), 17% (1984), 27% (1989) to 33% (1993). The utilisation of various ante-natal related services are shown in table 2.1 below.

**Table 2.1. Percentage Distribution of Births (1989-93) by Type of ANC & Assistance during Delivery for Mother and Percentage Births whose Mothers Received Tetanus Toxoid by Province**

Province	Received Tetanus Toxoid	Type of Ante-natal Care		Type of Assistance at Delivery		Number of Births
		Doctor/	Trained Nurse/Midwife	Doctor/	Trained Nurse/Midwife	
Nairobi	91.3	27.2	70.5	26.0	54.0	271
Central	91.5	21.6	76.5	19.4	54.8	710
Coast	85.5	33.9	56.1	12.3	20.2	533
Eastern	91.1	20.3	76.5	10.6	36.2	1202
Nyanza	92.2	22.7	72.1	13.0	26.9	1007
Rift Valley	88.6	25.7	66.8	11.8	29.9	1311
Western	91.1	15.1	80.5	6.0	29.7	989
<b>TOTAL</b>	<b>90.3</b> (88.7)	<b>22.7</b> (28.4)	<b>72.2</b> (48.8)	<b>12.5</b> (16.4)	<b>29.1</b> (33.6)	<b>6023</b> (7050)

Source: Health Information System / (KDHS, 1989 & 1993)

Figures in Brackets are for KDHS 1989.

From the table above, ante-natal care increased from 77.2% to 94.9% in the period 1989 to 1993. Over the same period there was an increase in administration of tetanus toxoid from 88.7% to 90.3%.

Not much is known about attendance at post-natal clinics, but taking completion of immunisation programme as a surrogate to post-natal clinic attendance, about 71.2% of under-fives did attend post-natal clinics in the 1990s, and the government targets at least 90% by the year 2000 (Republic of Kenya, 1992).

Information on infant and child mortality shows a decline from 1948 to present. Kenya's infant mortality rate (IMR) of 74 per 1,000 live births compares favourably with global average rate among low income countries which in 1990 was 92 per



1,000 live births. The under five mortality rate (U5MR) is about 105 per 1,000 live births as compared to U5MR of 189 in low income countries. Life expectancy at birth has risen from 40 years in 1962 to 60 years currently, while crude death rate dropped from 20 per 1,000 at independence to 12 per 1,000 in 1993.

The survey results (such as the KDHS) though impressive, tend not to give the true picture of the ante-natal care service utilisation. This is because the results include mothers who made at least one ante-natal visit, but as noted earlier, this is hardly useful given that ante-natal care requires constant monitoring of the expectant mother upto the time of delivery. Thus if the study considered only those mothers who made regular ante-natal visit throughout the pregnancy, which in cases of problematic pregnancy can be about 20, then the figure would fall drastically.

Tables 2.2 and 2.3 below show antenatal clinic attendance relative to other clinics at the Nairobi City Council (NCC) facilities in the study area as well as at Kenyatta National Hospital(KNH), between 1990 to 1995.

**Table 2.2. Attendance at the MCH/FP Clinics for NCC Facilities**

<b>NCC Facilities (Women Clinic) January - June 1994</b>					
<b>Clinics</b>	<b>Ante-natal</b>	<b>Postnatal</b>	<b>F/Planning</b>	<b>Grand total</b>	<b>%</b>
Kariobangi H/C	7,435	85	2,621	10,141	6.0
Mathare Lions	4,428	431	3,332	8,191	4.9
Mathare North	3,142	136	1,826	5,104	3.0
Baba Dogo H/C	3,404	201	1,498	5,103	3.0
Kasarani	0	0	0	0	0
Ruaraka	0	0	0	0	0
Kahawa	0	0	0	0	0
Woodley	1,598	68	650	2,316	1.4
Karen	1,387	82	2,679	4,148	2.5
Langata	2,959	39	1,653	4,651	2.8
Ngong Rd	3,160	159	1,620	4,939	2.9
Jinnah Avenue	2,451	78	768	3,297	1.8
Others	105,880	4,519	58,823	169,223	71.7
<b>TOTAL</b>	<b>135,844</b>	<b>5,798</b>	<b>75,470</b>	<b>217,113</b>	<b>100.0</b>

Source: Health Information System (1995)

**Table 2.3. Outpatient Clinics Attendance Summary at KNH (1990 - 1995)**

<b>Comparative OPD Summary for Kenyatta National Hospital (1990 - 1995)</b>						
CLINIC	1990	1991	1992	1993	1994	1995
ORTO. & FRACTURE	29,534	30,687	29,055	26,181	28,912	13,305
OBS & GYNAE**	31,206	22,353	23,261	23,528	20,476	14,908
ENT CONSULTANT	10,020	10,773	7,858	8,946	4,044	4,257
EYE CONSULTANT	7,386	7,527	6,398	7,323	2,901	3,111
GOPC	100,698	93,046	82,703	77,742	46,094	49,035
OTHERS	611,080	570,932	515,559	486,344	352,274	310,563

Source: Health Information System (1996)

\*\* Includes (Ante-natal, Post-natal, General Gynaecology, Colposcopy & Oncology)

### 2.3.1. *MATERNAL MORTALITY*

According to the World Health Organisation (WHO), maternal mortality is defined as the death of a woman during a pregnancy, or that which occurs within six weeks of termination of the pregnancy, and is expressed as a rate per 1,000 or 100,000 live births.

It is often extremely difficult to assess levels of maternal mortality. Maternal deaths tend to be under-reported even in developed countries with well developed / efficient vital statistics registration systems. Where such counting of births and deaths does not happen, estimating maternal mortality is particularly difficult. It requires knowledge about deaths of women of reproductive age (15 - 49 years), the cause of death and also whether the woman was pregnant at the time of death. Yet few countries count births and deaths; even fewer register the causes of death; and fewer still systematically note pregnancy status on the death form. The cause of death is routinely reported for only 78 countries or areas (for comparison, there are 190 WHO Member States) covering approximately 35 per cent of the world's population (WHO, 1996).

According to a recent study by the World Health Organisation (WHO) and the United Nations Children's Fund (UNICEF), there has been considerable

underestimation of maternal mortality in the past, there are nearly 80,000 more pregnancy-related deaths per year than previously reported. According to the study, some 585,000 maternal deaths occur in the world each year, 99 per cent of them in developing countries (WHO, 1996)

### 2.3.2. *MATERNAL MORTALITY IN KENYA*

There is no proper data on the magnitude of maternal deaths in Kenya, and that which is available is not very accurate. However it was estimated that maternal mortality rate (MMR) for Kenya was 204 and 168 per 100,000 live births in 1970 and 1977 respectively. Estimates from various facility studies gave varying figures; 300 (1987) for Kwale district Hospital, 380 (1978) for Kenyatta National hospital and 67 (1984) for Pumwani Maternity Hospital (Kenya government, 1992), see table 2.4 below.

**Table 2.4. Maternal Deaths by Cause, Facility and Date of Study**

Cause	Maternal Deaths by Cause, Facility and Date of Study		
	Kenyatta National Hospital (1972-77) (%)	Pumwani Maternity Hospital (1976-86) (%)	Kwale District Hospital (1987) (%)
Haemorrhage	14	13	34
Sepsis	21	19	11
Abortion	23	?	?
Hypertensive Disorder	3	21	3
Rapture of the Uterus	6	9	14

Source: Kenya's Programme of Action for Children in the 1990s, (1992)

These figures could however not be considered representative of the country since there exist significant regional differences.

Table 2.5 below shows the major causes of maternal deaths at Kenyatta National Hospital (KNH).

**Table 2.5. Maternal Deaths at Kenyatta National Hospital (KNH)**

Cause	Frequency	Percent (%)
Abortion	38	24.4
Hypertensive Disease in Pregnancy (HDP)	20	12.8
Puerperal Sepsis	20	12.8
Anaemia	15	9.6
Cardiac	11	7.1
Postpartum Haemorrhage (PPH)	9	5.8
Ectopic Pregnancy	8	5.1
Malignancy	7	4.5
Ruptured Uterus	6	3.8
Malaria	3	1.9
Renal	3	1.9
Road Traffic Accident (RTA)	3	1.9
Anaesthesia	3	1.9
Liver	2	1.3
Others	8	5.1
<b>TOTAL</b>	<b>156</b>	<b>100.0</b>

Source: Eastern and Central Africa Journal of Obstetrics and Gynaecology (1989)

The figures show that the leading cause of maternal mortality at the country's main teaching and referral hospital is abortion accounting for about 24.4% of the total maternal deaths. Second is hypertensive disease in pregnancy and puerperal sepsis with for 12.8% of the maternal deaths each. Maternal related deaths rose from 40 to 143 from 1990 to 1995 at the Kenyatta National Hospital (see Table 2.6).

**Table 2.6. Comparative Admissions, Discharges & Deaths (1990 - 1995)**

YEAR	ACTIVITY	Kenyatta National Hospital					TOTAL
		D I V I S I O N					
		OBS & GYNAE	PAEDS	SURGERY	MED.	PRIVATE WING	
1990	Admissions	27,418	15,650	12,022	12,454	696	68,240
	Discharges	27,576	14,564	10,906	11,028	634	64,708
	Deaths	40	1,548	667	2,036	36	4,327
1991	Admissions	27,719	16,236	10,764	15,737	669	71,125
	Discharges	28,081	12,912	10,245	13,354	613	65,205
	Deaths	107	1,689	691	2,114	54	4,655
1994	Admissions	15,190	9,277	9,222	12,890	875	47,454
	Discharges	15,402	7,673	8,705	11,569	754	44,103
	Deaths	151	1,442	594	2,221	101	4,509
1995	Admissions	18,197	10,015	7,667	12,117	1,322	49,318
	Discharges	18,050	8,237	7,079	9,483	1,192	44,112
	Deaths	143	1,720	586	2,641	116	5,206

Source: Health Information System (1996)

\*\* Includes (Ante-natal, Post-natal, General Gynaecology, Colposcopy & Oncology)

**LITERATURE REVIEW**

**3.0 INTRODUCTION**

This chapter reviews the general literature on demand for health services with emphasis on ante-natal care as well as specific literature on the same on Kenya.

**3.1 GENERAL LITERATURE**

Grossman (1972) constructed a model of the demand for the commodity “good health”. The main contention of the model was that health could be viewed as durable capital stock that produces an output of healthy time per period, as measured by healthy days. Grossman alleged that this output distinguishes good health from other forms of human capital.

The model assumes that individuals inherit an initial stock of health that depreciates with age and can be increased by investment. In the framework, the “shadow price” of health depends on many other variables, besides the price of medical care. He showed that the shadow price rose with age if the rate of depreciation on the stock of health rose over the life cycle and fell with education if more educated people are efficient producers of health. Under certain conditions according to Grossman, an increase in shadow price may simultaneously reduce the quantity of health demanded and increase the quantity of medical care demanded.

The model suggests that the demand for health care is a derived demand and focuses on the primary demand (demand for health). Consumers are said to demand health for two basic reasons. Firstly as a consumption commodity, with health entering their utility function directly, and secondly as an investment commodity, where it determines the amount of time available for market and non-market activities.

The individual's objective is to maximize utility (life-time utility in this case). The maximand takes the neo-classical form:

$$U = U (\phi_0 H_0, \dots, \phi_n H_n, Z_0, \dots, Z_n) \dots\dots\dots (1)$$

Where  $H_0$  is the inherited stock of health;  $H_i$  is the stock of health in the  $i$ th time period;  $\phi_i$  is the service flow per unit stock;  $h_i = \phi_i H_i$  is the total consumption of "health services", and  $Z_i$  is the total consumption of another commodity in the  $i$ th period.

Maximizing the utility function subject to the constraint upon capital stock, the time constraint and the life-time budget constant, taking into account the marginal product of the stock of health as measured in healthy days and the household production functions, gives the marginal condition for new health investment:

$$\frac{U_{\phi t(i+r)}}{\chi} = \frac{\Phi'_t}{MC_{t-1}} + \frac{W_t \Phi'_t}{MC_{t-1}} = r + \delta'_t - MC_{t-1} \dots\dots\dots (2)$$

Where  $U_{\phi t} = \delta U / \delta \Phi_t$  is the marginal utility of health time;  $\chi$  is the marginal utility of wealth;  $\Phi_t$  is the marginal productivity of health as measured by healthy days;  $MC_{t-1}$  is the marginal cost of health investment in period  $t-1$  and  $\delta_{t-1}$  is the percentage rate of change in marginal costs between periods  $t-1$  and  $t$ .

Basically, the second equation is the Grossman model, where inherited health stock and rates of depreciation are given, the optimal quantity of gross investment determines the optimal quantity of health capital. The equation thus sets at the

margin, the user cost of health care equal to the discounted marginal benefits of health, implying that benefits must equal costs in equilibrium.

The Grossman model has been criticised on the grounds that it assumes the existence of certainty, that the depreciation rate is known, leading to the logical conclusion that each individual can choose his/her own time of death. Muurinen (1982) criticised the model on two main grounds. Firstly, that it is not credible to assume dichotomy of stock health benefits, in that health is demanded for both its consumption benefits (enjoying good health) as well as its investment benefits (freedom from illness to participate in selling labour value). Secondly that the health stock is not the only durable capital good producing flow of services. She noted that the stocks of education and wealth also produce flows of services, and that all three capital stocks could be compatible to a degree.

In his study, Acton (1975), examining the effects of non-monetary factors on the demand for medical care, he examined the demand for both free and non-free health care services using data from a 1965 survey of users of New York's "free" outpatient departments and municipal services in city's hospitals. He examined the effects of money and time prices, non-earned income and other socio-economic factors such as age, family size, habits and race, using the following model:

$$\text{Maximize: } U = U(M, X)$$

$$\text{Subject to: } (P + wt)M + (q + ws)X \leq Y = y + wT.$$

Where  $U$  is the utility;  $M$  is the medical services;  $X$  is all the other goods and services;  $P$  is the out-of-pocket payment per unit of medical services;  $t$  is own time input per unit of  $X$ ;  $q$  is the money price per unit of  $X$ ;  $s$  is the own-time input per unit of  $X$ ;  $w$  is the earnings per hour;  $Y$  is the total income;  $y$  is the non-earned

income and finally  $T$  is the total amount of time that is available for market as well as for own production of goods and services.

The results of his study confirmed the prior envision that the non-monetary factors (such as time costs) acted as money proxies in discouraging demand for medical care where 'free' care was available. For municipal health care and private health care, he found that income had a negative effect on the former and a positive one for the latter, but both were not statistically significant. The money, time prices (for 'free' services) and travel distance were found to affect the demand for health care negatively.

Acton introduced a crucial feature in his study, that is the "time price" for 'free' health services. However, his study also had a key weakness in that he estimated both demand for outpatient and inpatient services independently while essentially the two are complements, in the sense that demand for inpatient services is a function of outpatient visits among other things.

Women's views on benefits or experiences of ante-natal care are noted in a number of studies (O'Brien and Smith, 1981; Hall *et al*, 1988). It is reported that they object to long waiting time, the impersonal productionline atmosphere in most clinics, lack of consistent information, advice and support and discontinuity of care providers (Garcia, 1982) and Flint *et al* (1987) also tried to demonstrate continuity of care as an important concept in improving ante-natal care, but noted that the care must also be effective, appropriate and accessible besides the continuity.



Research has also established that a number of women often got little out of the visits and experienced them as unpleasant and alienating Macintyre (1982). In the study she looked at the content of care in ante-natal clinics using observation research method, and found lack of knowledge about purpose of ante-natal care to be an important deterrent. She also found that 37% of the women didn't ask questions when she looked at the nature of interviews between the women and the clinicians, and suggested that improving of the quality of care was more important than improving the physical aspects of the clinic. It is due to these findings that improvement in the manner of ante-natal care delivery have been suggested and indeed implemented in some countries such as Britain.

It should be noted that some of the above complaints are not peculiar to pregnant women or ante-natal care alone; for example, with majority complaining of communication failure which is also common with patients in other sorts of medical clinics. In Britain attempts have been made to improve communication between the women and attendants, reduce waiting time, introduce more continuity and greater personalisation.

From a study conducted in Aberdeen by Macintyre(1981), women were asked what they thought of routine ante-natal care and what benefits they got from the visits. Regardless of education, social class or contact with the health services, majority of respondents could not identify the benefits and majority thought they had to attend or there must be a point otherwise the ante-natal clinics would not exist. Others thought they would feel guilty for not attending the clinics if the visits turned to be beneficial. From the study, 5% said the visits were useful, 82% said they were neutral or reassuring and 13% said they were useless.

After birth some women were even more negative, less than half said it had made a difference, a minority said they would have been better off with less care. Those with straight forward pregnancy could not see how it had helped them while those with complications pointed out that it had not prevented them.

In a Philippine study on demand for primary health care by Akin *et al.*(1985) it was found that only 36 percent of the poorest mothers received any modern prenatal care, in contrast to 76 percent of the wealthiest mothers. While 22 percent of the poorest mothers used free public care, 44 percent of the richest mothers used free prenatal services. Free services thus had little impact on poor mothers.

For some women, non-monetary factors affect demand for health services significantly. For example, it was noted that attendance was an onerous prospect especially in Britain where they are characterised by long delays and lack of continuity of staff contact. Providing community clinics with nursery facilities has been suggested as a possible remedy (Reid & Macintyre, 1980)

Studies of women making appropriate use of ante-natal services have shown that they are likely to be married, have more schooling and believe in preventive services. On the other hand, less educated women with similarly less educated husbands and who are less than 20 years of age were found to be 7.5 times more likely to receive inadequate ante-natal care (Gort, 1979). More research is needed so as to determine the shortcomings of the clinics as perceived by the women.

Heller (1982) and Akin *et al.* (1985) found that the effect of prices on consumption of prenatal services was not statistically significant, although there was slightly more effect of price on use than for outpatient care. Heller was using data from a

household survey in Malaysia, where he analysed demand for health care as a function of economic and discretionary care as two different goods. He found the total medical care to be rather highly inelastic to money price, income and distance (time costs), but also an increase in income resulted in demand shifting from public to private providers. Time costs seemed to matter more for prenatal and delivery care than for outpatient care, though the effects seem to be quite small.

Many studies show that education has a strong positive effect on use of modern services. For birth-related services, the mother's education has a strong positive effect on her choosing a modern provider, seeking prenatal care, having her baby checked after birth, and getting the baby immunised (Akin, *et al.* 1985; Wang, *et al.* 1987). Akin's analysis was based on Bicol multipurpose survey 1978 (BMS 78), a multi-visit household survey of 1906 households, and 100 communities. His aim was to analyse how new information from the study on demand for public health care (PHC) may improve strategies used in the implementation of PHC. His study examined factors affecting demand for health services such as outpatient services, ante-natal, maternity, immunisation and well-baby days. He found that money prices, transport time and cost as well as waiting time had very minor explanatory powers on demand for health services and only severity of the illness was found to be statistically significant among the variables studied.

Akin noted that the demand for modern or private care also increased with the seriousness of the illness, he also noted that for prenatal care, the cost of care reduced demand while the effect of cost on well-baby and immunisation was positive, and so was the waiting time. Overall, the main factors determining demand were found to be demographic variables especially those affecting the mother's knowledge, attitude and beliefs on health care. Since the prices and distance were

not found to be significant determinants of demand, it appeared therefore that the effort should not be mainly on reducing the distance and prices of rural facilities, while on the other hand the insignificant effect of prices suggests that there was some feasibility of some self financing.

Dor and Van de Gaag (1987) conducted studies in the Cote d'Ivoire basically with aim of analysing the effects of travel time and other economic variables on the demand for medical care in developing countries. There was no user fees being charged, but costs such as travel time influenced demand negatively though not significantly. The implication here is that demand could be stimulated by locating facilities closer to the users.

Akin *et al* (1986) in their multipurpose study also aimed at analysing demand for modern maternal health care. The specific objective was to establish whether charging fees would act as a disincentive to the utilisation of maternal and child health care services. They found that money and time prices tended to influence the choice of delivery negatively, however the changes in prices and household income had insignificant effect on choices of delivery services.

Holtman and Olsen (1976) in their study, estimated the demand for dental care in the city of New York. They used households' utilisation of dental care in New York for the period 1971/72 as the dependent variable, while for the independent variables included in the regressions were; travel time, waiting time, income, service fee and other social/ demographic variables.

They found that money prices as well as waiting time had negative effects as expected on the demand for the dental care. They found that demand for dental care

was inelastic with respect to income, but both size and composition of household influenced the demand significantly. They later for estimation purposes interacted some variables to see if this may have an effect on the results only to confirm their earlier findings that travel and waiting time influenced the demand for dental care negatively, but not significantly.

Hay *et al* (1982) in a similar study developed a model to analyse economic and socio-demographic factors influencing the demand for dental care. They used primary and secondary data from questionnaires and claim forms on dental examinations respectively from 161 individuals in 1978. They tested two hypotheses. Firstly, that the demand for dental care fell as the charge for dental service rose and as the wage rate increased. Secondly, the hypothesis that more time was spent on home production of dental care as dental charge rose and less when wage rate increased.

They found that the out-of-pocket payments had a significant negative effect on the demand for dental care. They also found that income and family demographic characteristics had statistically insignificant effect, while age was found to have a significant negative effect, suggesting a decrease in health investment with age. One notable weakness of their study was that the study considered the total health visits for a period of one year. Reliability of such data is affected by recall as patients may not remember all the visits they made over such a period.

Akin *et al* (1986) and Mwabu(1986, 1989) established that the perceived quality of care was an important determinant of the demand for health care. On the other hand Wang *et al* (1987) found that the number of prenatal visits in urban areas were negatively affected by whether the provider at the public facility was a

midwife rather than a physician. In the rural areas he found that the availability of a midwife tended to have a significant positive effect.

Ellis *et al* (1994) sought to establish the determinants of patients' choice of health facilities, their study was in the vicinity of a large public hospital in Cairo. They used a nested logit modelling procedure to evaluate the importance of each variable in determining demand. Two multivariate models of demand for health care were estimated for outpatient and inpatient care respectively. The variable assumed to influence demand included individual characteristics such as age, gender and education, household characteristics such as annual expenditure, health insurance coverage and family relations and finally facility characteristics such as price, quality and location.

An analytical framework similar to one used by Mwabu *et al* (1993) was used in the ensuing form:

$$U_{ij} = U(X_i, Z_j, \epsilon_{ij})$$

where  $U_{ij}$  is the utility of patient  $I$  with characteristics  $X_i$  in a health state  $j$  with characteristics  $Z_j$ . Unlike in Gertler *et al* (1987), they specified an indirect utility function, with income and price variables being entered alone without imposing restrictions on the form of interactions.

They found annual household expenditure to be a significant determinant of patients' choice of facility. The higher the ability to pay, the higher the preference for facilities with higher average costs, presumably due to better quality. They also found other factors such as age, sex, education and insurance to strongly impact the use of medical services.

It has been established in other studies that in addition to procedural aspects of clinic attendance, some of the women tend to find the interviews and the physical (vaginal) examination off putting, although such instances may be the result of poorly managed examinations in the past (Fordrey *et al*, 1980). Methver (1982) studied in detail the ante-natal care booking of interviews by midwives and concluded that organisation of care in clinics prevented the women from forming relationships with midwives. She suggested that midwifery process could be used to form a more satisfactory basis for ante-natal care.

It has also been established that there is a possibility that some women either smoking or consuming alcohol may delay clinic attendance through fear of staff rebuke and/or believe themselves unable to alter their behaviour (Parson and Perkins, 1980). Other aspects may be difficult to change, for example the medical setting at the clinic may be an unfamiliar and threatening environment to the women, with attempts by Nursing staff failing to transcend the difficulties owing to their dissimilar back-grounds (Cohen, 1985)

Less common, the women may delay attendance through failure to accept the fact that they are pregnant especially in cases of unwanted pregnancy (such as young women still living with parents). In answer to the question 'why don't women attend ante-natal care?' Parson and Perkins (1980) found these women to be in the following categories; frightened teenagers, competent child-bearers and those with social problems, the same groups identified by O'Brien and Smith (1981) as those who came late for ante-natal care.

It has been argued that women may be put off by the manner in which ante-natal care is provided (e.g. long waiting times, inconvenient appointment times, lack of

continuity of care), as well as the perceived benefit by the women (Garcia, 1982). The assumption that the ante-natal care provided is actually beneficial is questioned and need to examine its effectiveness has been suggested (Macintyre, 1982)

### 3.2. SPECIFIC LITERATURE ON KENYA

In a study on efficiency and equity effects of introducing user fees in government health facilities, Mwabu and Mwangi (1986) found that quality of service was a significant determinant of demand for health care, and that its improvement influenced demand for the care positively. They recommended that the user fee revenues should be invested in improving the quality of services. They argued that improvement in service quality would also improve equity in the sense that the poor have a higher probability of using public health services than the affluent, and were therefore likely to benefit from the improvement of such services. Subsequent studies such as Ellis (1987), Ellis *et al* (1994), Mwabu *et al* (1993) have all tended to confirm that quality of care has been an important determinant of demand for health care.

Mwabu (1986) and Mwabu (1989) analysed household choices of medical facilities during one's illness episode, using a conditional logit model specification. He demonstrated how the choice can be influenced by monetary and non-monetary factors. He found that the economic variables including time and money had an influence on demand for health services, but the effect were statistically insignificant, especially in the case of income. Education was found to influence individual choice of modern facility though also not significantly. A factor the study noted that had a significant effect on choice of health facilities was religion, while education increased the probability of an individual seeking treatment from modern facilities, but its effect was not statistically significant.



Ndele (1988) constructed a model for analysing demand for health services in Nairobi similar to Akin *et al* (1986), Heller (1982) and Dor and Van de Gaag (1987). In the model whereby demand for health was influenced by both economic and environmental factors, he noted that use of health services in Nairobi is determined by patient's income, drug cost, education level, attitude of staff and return visits. He also noted that the effect of drug cost and income was insignificant. He also established that age and quality of services affected demand for family planning and maternity services, in that the higher the quality of these services, the more the patients would be willing to pay for them. For ante-natal services, quality of service was also significant, with the facilities having high quality ante-natal services being more popular.

Kimani, Mwabu and Wang'ombe (1991) conducted a household survey in Kwale and Kirinyaga districts to study the utilisation of maternal and child health (MCH) services in the two districts. Using a questionnaire in their 1989 study, they targeted mothers of under fives for questioning, where they sought to analyse the behaviour of the mothers seeking MCH services (ante-natal, postnatal and immunisation).

From the study, they found the utilisation levels quite encouraging, with about 88% of the mothers seeking care. This finding is however debatable since the mothers included those making at least one visit to an MCH clinic. Other findings included the fact that traditional practices led to a lot of Kwale women delivering at home, but not without serious consequences as many of them ended up with infections or excessive bleeding. Long travel distances to facilities also discouraged a number of women from getting their children fully immunised. From Kirinyaga the factors they identified as disincentives to seeking care included ignorance, distance and travel

costs. Overall the major factors impacting on demand for MCH services were common to both of these districts.

Mwabu *et al* (1993) conducted an empirical analysis of the relationship between medical care quality and medical care demand, using household and facility data from Meru district. Their analysis differed from earlier ones such as Gertler *et al* (1987) and Litvack and Bodart (1993) in that they included various types of drugs and diagnostic equipment among measures of facility quality. They also separated the effects of specific quality measures so as to enlarge the policy makers' menu of facility attributes that can be varied to improve quality.

They developed a version of demand model used earlier by Gertler and Van der Gaag (1990). They used four dependent variables, indicating type of provider selected for consultation for government, mission private and self treatment. The explanatory variables were categorised into three groups. Firstly, the access variables (distance and exogenous adult outpatient charge). The second category included various aspects of quality of service and the third had the individual household characteristics. They anticipated the user charge and distance to affect the demand negatively, while the quality of care was expected to have a positive effect if perceived as beneficial by the patients.

From their results they found that both user fees and distance had the hypothesised negative signs, and drug availability had a positive sign, but none of their coefficients were statistically significant. Another finding was that there was no difference in demand for health care was found by gender, though the coefficient sign suggested that women may be more handicapped than men by distance.

Majority of the demand related studies conducted in Kenya (majority of which are on user fees) have emphasised the importance of quality of care, they have noted that this tends to outweigh the negative effects of money price (user fees). Therefore to influence utilisation of health services (including ante-natal care) positively, improving the quality of the service should be given high priority.

### 3.3. CURRENT STUDY RELATIVE TO PAST STUDIES

This study tries to establish the factors that influence demand for ante-natal care in Nairobi's slum areas using a utility maximising model similar to that used by Gertler and Van der Gaag (1990) and Mwabu *et al* (1993). The study examines a wide spectre of factors including socio-demographic and other policy characteristics that influence the demand for ante-natal care.

The present study is in many ways related to earlier studies reviewed above in that it tries to enhance the knowledge on the specific factors influencing demand for health care by examining a wide spectre of factors including socio-economic or otherwise. While it generally considers the demand side, it also considers the supply side by taking into consideration policy characteristics such as user fees, drug availability and also facility characteristics such as quality of service, a factor that has noted in numerous studies as being an important determinant of demand.

This study differs slightly from those reviewed in that it recognises the fact that health service is not a homogenous commodity and so should not be considered as one good. It therefore considers the demand for ante-natal care among women from the disadvantaged class (the slum dwellers).

**CONCEPTUAL FRAMEWORK**

**4.0 INTRODUCTION**

The purpose of this chapter is to develop the analytical framework which will be used to identify the key determinants of demand for ante-natal care in disadvantaged areas of Nairobi city. Section 4.1 is on model specification. Section 4.2 is on definition of variables. Section 4.3 is on the estimation procedure.

**4.1 MODEL SPECIFICATION**

Generally in economic theory, an individual consumes goods and services in an attempt to ‘maximise utility’. It is assumed that she is in a position to make rational choices from the available goods and services (including health care), i.e. s/he is assumed to be a rational and sovereign consumer. Demand for health care (including ante-natal care) is said to be derived from demand for health (Grossman, 1972).

Following Gertler and Van der Gaag (1990) and Mwabu *et al* (1993), the ante-natal care consumer is assumed to be rational in that s/he wishes to maximise expected utility subject to certain budgetary constraints. This hypothesis can be illustrated symbolically as follows:-

$$U_{ij} = U_{ij}(h_{ij}, c_{ij}) \dots\dots\dots(1)$$

Where  $U_{ij}$  is the utility the  $i^{th}$  individual expects from the consumption of ante-natal care and other commodities;  $h_{ij}$  is the  $i^{th}$  individual’s consumption of ante-natal care; and  $c_{ij}$  is the  $i^{th}$  individual’s consumption of other goods.

The consumption of ante-natal care ( $h_{ij}$ ) is a function of vectors of individual's socio-economic characteristics ( $x_i$ ) and health care facility specific attributes ( $z_{ij}$ ), i.e.

$$h_{ij} = h(x_i, z_{ij}) \dots\dots\dots(2)$$

The value of other goods ( $c_{ij}$ ) the individual can afford after taking care of the health care related expenses can be expressed as follows:

$$c_{ij} = I_i - m_{ij} \dots\dots\dots(3)$$

where  $I$  is the income at the disposal of the household (including borrowed or charity), and  $m_{ij}$  is the total cost of resources spent in seeking ante-natal care (including both money and time costs).

The consumer cannot demand ante-natal services indefinitely for she is subject to constraints which include; her income, assets, consumption/ expenditures and time available for domestic and other chores. On the assumption of rational behaviour on the part of the women, whereby they aim at maximising utility from ante-natal care utilisation, the demand equation can thus be generalised as a standard linear demand model for empirical estimation:

$$D_{anc} = F(X + Z + P) + \epsilon_i \dots\dots\dots(4)$$

Where  $D_{anc}$  is the demand for ante-natal care;  $X$  is a vector of socio- economic characteristics of the women;  $Z$  is a vector of facility characteristics such as quality of service, drug availability;  $P$  is a vector of policy characteristics such as user fees and other costs (tests, drugs etc).

Dis-aggregating X, Z and P, we get the set of explanatory variables in Table 4.1 in section 4.2 below.

## 4.2 DEFINITION OF VARIABLES

### 4.2.1 DEPENDENT VARIABLE

An ideal situation would have been to use a categorical dependent variable taking a value of 1 for those who comply with the full ante-natal schedule and 0 otherwise. However, given that only 0.3 % complied, in this study the number of ante-natal care visits will be used as a proxy of demand for ante-natal care.

### 4.2.2 INDEPENDENT VARIABLES

Table 4.1 below provides definitions of variables in the estimated demand model.

**Table 4.1: Definition of Variables**

Variable Name	Abbev.	Definition and Measure
Ante-natal Visits	ANTVIS	Total number of visits the woman made during the entire ante-natal period.
Mother's Age	AGE	Age of woman in years
Marital Status	MSTAT	Dummy variable which equals one if woman is married, otherwise it is zero
Mother's Education	MEDUC	Dummy variable which equals one if woman education is secondary and above and zero otherwise
Household head's Education	HHEDUC	Dummy variable which equals one if household head's education is secondary and above and zero otherwise.
Mother's Occupation	MOCP	Dummy variable which equals one if woman is working and zero otherwise.
Household head's Occupation	HHOCP	Dummy variable which equals one if household head is working and zero otherwise.
Religion	REL	Dummy variable which equals one if woman's religion is non-Catholic and zero otherwise.
Travel Time	TRVTM	Total time in minutes spent travelling to

		facility
Waiting Time	WAITM	Total time in minutes spent waiting for service at the facility.
User Fee per Visit	UFEE	Cost of treatment per visit in Kenya shillings
Drug cost per Visit	DRUGC	Total amount spent on drugs prescribed at the clinic, in Kenya shillings.
Cost of ANC related tests	ANCTES	Total amount spent on other ANC related tests.
Assets	ASST	Total value of assets valued in Kenya shillings.
Consumption/Expenditures	CONEXP	Total amount of household consumption/ expenditure valued in Kenya shillings
Income	HHINC	Total household income per month in Kenya shillings from various sources such as: salary, pension, farming, remittances etc.
Perceived Quality	OVQUAL	Dummy variable which equals one if perceived quality of care is good and above and zero otherwise.

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#### 4.3 HYPOTHESISED RELATIONSHIPS

Below is the hypothesised relationship between the dependent variable (demand for ante-natal care) and the independent variables, from the theoretical framework developed above.

The utilisation of ante-natal care should decline with money price (user fee), the higher the price, the less ante-natal services will be demanded and vice-versa (negative relationship)

The higher the household income, higher will be the ability to purchase more services, thus utilisation increases with income. Similarly demand for ante-natal care is positively influenced by occupation, the employed are likely to demand more services than the unemployed. This is because the demand is likely to decline as

accessibility costs rise, these include travel costs (bus or taxi) and long travel distance.

Demand for ante-natal care is expected to rise as the individual's education level rises, as an educated person is expected to value health more than his/her counterpart with less education. This is especially true for preventive health care (including ante-natal care), making the educated persons more healthier and thus demand less curative care. The higher the education level attained, the higher is the demand for ante-natal care likely to be (strong positive effect)

The utilisation of ante-natal care services is likely to be affected negatively by both Time and Distance, the longer the time taken (travelling or waiting for service), the lower is the demand likely to be (negative effect)

Demand for the ante-natal care is likely to rise with the woman's age, as the more mature the pregnant woman is, the higher is the likelihood of her demanding more ante-natal care and vice-versa. Marital Status is also likely to influence demand positively, with married women likely to demand more services than the single women(positive effect).

The a priori sign for the religion variable is not conceivable, making effect of religion indeterminate before the model estimation, for the demand will depend on the individual's religious inclination.

With improved quality of care at the ante-natal clinics, the demand is set to rise, and if the women perceive the quality as good, they will demand more care. Thus the higher the quality, the higher the demand (positive effect)



#### 4.4 ESTIMATION PROCEDURE

The demand for ante-natal care is estimated using double logarithmic model specification, with the objective of establishing the significant determinants from a host of factors initially hypothesised as influencing the demand.

One hundred and sixty observations were used in the estimation process, whereby the model used is defined as follows:

$$\text{LN(ANTVIS)} = \beta_0 + \beta_1\text{LN(AGE)} + \beta_2\text{LN(INCOME)} + \beta_3(\text{MEDUC}) + \dots + \beta_n(\text{REL}) + \varepsilon_{1\dots} \quad (5)$$

Where ANTVIS is the demand for ante-natal care, while the other variables are defined in table 3.1.

## CHAPTER 5

### FIELDWORK METHODOLOGY

#### 5.0 INTRODUCTION

The purpose of this chapter is to describe the sampling procedure and the data collection process. Section 5.1 provides an overview of the study area, as well as the justification for its choice. Section 5.2 describes the study design and section 5.3 provides a description of the items including the questionnaire, while section 5.4 outlines the limitation of the sample.

#### 5.1 STUDY AREA AND JUSTIFICATION OF ITS CHOICE

##### 5.1.1 *STUDY AREA*

As stated earlier, the survey was conducted in two of Nairobi province's slums; Kibera and Mathare. The Table 5.1 below, shows the estimated population of Nairobi by divisions, based on the 1989 census (see appendix I for map of Nairobi area).

Table 5.1. Estimated Population for Nairobi (1992 and 2000)

<b>Estimated Population for Nairobi 1992 and 2000</b>		
<b>Division</b>	<b>1992 Estimated Population</b>	<b>2000 Estimated Population</b>
Makadara	170,000	220,000
Kamukunji	160,000	190,000
Starehe	80,000	80,000
Langata	260,000 **	390,000
Dagoretti	170,000	250,000
Westlands	130,000	160,000
Mathare	350,000 **	570,000
Embakasi	200,000	350,000
<b>TOTAL</b>	<b>1,520,000</b>	<b>2,210,000</b>

Source: Ministry of Health, Health Information System

\*\* Division with highest population from where the slums areas were selected

As can be seen from the tables 5.2 and 5.3, Kibera is in Langata division, while Mathare is in Mathare division, and the two areas had estimated populations of 260,000 and 350,000 residents respectively in 1992. Table 5.2 shows a further subdivision of the two divisions into locations and their specific populations.

**Table 5.2. Population Densities of Main Sub-locations with Major Slums**

<b>Population Densities of Main Sub-locations with Major Slums</b>				
Division	Sub-Location	Area Sq.Km.	Estimated Population (1992)	Population Density (1992)
Langata	Kibera	3	147,258	49,086
Mathare	Huruma	1	63,140	63,140
Mathare	Mathare	2	54,120	27,060
Mathare	Korogocho	1	53,875	53,875
Dagoretti	Kawangware	4	53,000	13,000
<b>TOTAL</b>		<b>11</b>	<b>371,393</b>	<b>206,161</b>

Source: Health Information System (HIS)

**Table 5.3. Populations for Langata and Mathare**

<b>Populations for Langata and Mathare</b>			
Division	Location	Population (1989)	Estimate (1999)
LANGATA	Kibera/Woodley	130,000	226,000
	Karen/Langata	20,000	34,000
	Kenyatta/Golf Course	22,000	38,000
	Mugumoini	53,000	92,000
		<b>225,000</b>	<b>390,000</b>
MATHARE	Mathare	104,000	190,000
	Kariobangi	66,000	127,000
	Kahawa	44,000	85,000
	Kasarani (Ruaraka)	68,000	140,000
	Roysambu	14,000	28,000
	<b>296,000</b>	<b>570,000</b>	

Source: Health Information System (HIS)

**Table 5.4. Distribution of Nairobi City Council (NCC) Facilities offering Preventive / Promotive Care**

<b>Distribution of NCC Facilities Providing Preventive/Promotive Care (P &amp; P)</b>			
	<b>1992 TOTAL</b>		
<b>Division</b>	<b>Population 1992</b>	<b>MCH/FP Facilities</b>	<b>Population/Facility</b>
Makadara	170,000	11	15,455
Kamukunji	160,000	7	22,857
Starehe	80,000	4	20,000
Langata	260,000	6	43,333
Dagoretti	170,000	3	56,667
Westlands	130,000	4	32,500
Mathare	350,000	6	58,333
Embakasi	200,000	4	50,000
<b>TOTAL</b>	<b>1,520,000</b>	<b>45</b>	<b>33,778</b>

Source: Health Information System (HIS)

Other major slums in Nairobi include Huruma, Korogocho and Kawangware, and these have population densities averaging 19,000 persons per square kilometre, which is much higher than the city average of 3,000 persons per square kilometre.

These slum areas generally lack basic facilities including physical infrastructure for water, sanitation and housing, and the lack of the former two increases the substantially the health risks of the residents.

Table 5.5 below, shows the health facilities that are in the two divisions by type and agency.

**Table 5.5. Facilities in Langata and Mathare by Type and Agency**

FACILITY	TYPE	AGENCY	DIVISION	BEDS			
				GEN.	MAT	COTS	TOTAL
Kenyatta Nat Hosp	Hospital	PMO	Langata	1,727	168	66	1,961
Mbagathi D. Hosp	Hospital	PMO	Langata	250			250
Forces Memom.	Hospital	Other Min	Langata	160	30	5	195
Langata H/C	H/Centre	NCC	Langata		24	24	48
Langata H/Clinic	H/Clinic	Private	Langata		24	24	48
Masaba Nur.Hm	N. Home	Private	Langata	50			50
Nairobi Nur.Hm	N. Home	Private	Langata	66			66
Karen HC	H/Centre	NCC	Langata				
Ngong Rd. SH/C	SH/Centr	NCC	Langata				
Woodley H/C	H/Centre	NCC	Langata				
Jinnah Avenue Cl	H/Clinic	NCC	Langata				
Mathare Ment H	Hospital	PMO	Mathare	1,138			1,138
Mathare Nor. H/C	H/Centre	NCC	Mathare		24		24
Huruma Nur.Hm	Mat Hom	Private	Mathare		10		10
Huruma Lions	Clinic	NCC	Mathare				
Alice Nur.Hm	N. Home	Private	Mathare	50			50
Ideal Nur.Hm	N. Home	Private	Mathare	28	27		55
GK Max Prison D	Hospital	PMO	Mathare	195			195
Kahawa HC	H/Centre	NCC	Mathare		24		24
Kasarani Nur. Hm	N. Home	Private	Mathare	18			18
Kasarani Disp.	Dispen.	NCC	Mathare				
NYS H/Centre	H/Centre	PMO	Mathare				
Kariobangi H/C	H/Centre	NCC	Mathare				
Babadogo H/C	H/Centre	NCC	Mathare				

Source: Health Information System

The government has a total of 38 facilities, through the Ministry of Health (MOH) with 6 hospitals, 17 health centres and 15 dispensaries, while the NCC through the ministry of local government (MOLG), has one hospital (Pumwani), 20 health centres and 8 dispensaries, the churches have about 17 dispensaries and clinics. The combined NGO/Private are the largest provider in terms of facilities (32%) This include hospitals, maternity/nursing homes, chemists/pharmacies, private medical practitioners, as well as private company facilities totalling to 56 facilities.

The government operates facilities through both the provincial medical office (PMO) and the NCC, but the former operates mainly specialised services, mainly

curative such as mental services, infectious diseases, spinal injury. Most of these facilities offer services within institutions of the national government and are thus not open to the general public. These institutions include the military, police, national youth service, general service unit (GSU), prisons and the railways. The majority of the general public therefore visit the NCC facilities whose various descriptions can be seen from Tables 5.6 and 5.7 below.

**Table 5.6. NCC Health Facilities' Description**

<b>Facility</b>	<b>Category</b>	<b>Beds</b>	<b>Staff</b>	<b>Preventive/Promotive Services</b>	<b>Buildings &amp; Equipment</b>
Jinnah Avenue Clinic (Langata Division)	Clinic	NIL	9	Immunisation Ante-natal Care Growth Monitoring CDD Corner/ Rehydration Centre	Fair
Karen H/Centre (Langata Division)	Health Centre	Nil	23	Immunisation Ante-natal Care Family Planning Growth Monitoring Health Education Home Visits	Good
Langata H/Centre (Langata Division)	Health Centre	24	52	Immunisation Ante-natal Care Family Planning Growth Monitoring Health Education Home Visits	Fair
Ngong Rd H/C (Langata Division)	Health Centre	NIL	33	Immunisation Ante-natal Care Growth Monitoring Health Education CDD Corner/ Rehydration Centre	Fair
Woodley Clinic (Langata Division)	Clinic	NIL	18	Immunisation Ante-natal Care Growth Monitoring CDD Corner/ Rehydration Centre	Fair
Baba Dogo Disp (Mathare Division)	Dispensary	NIL	28	Immunisation Ante-natal Care Family Planning Growth Monitoring	Fair
Huruma Lions Clinic (Mathare Division)	Clinic	NIL	20	Immunisation Ante-natal Care Family Planning Growth Monitoring Health Education Post-natal Care Child Welfare Clinic	Poor
Kahawa H/Centre (Mathare Division)	Health Centre	24	56	Immunisation Ante-natal Care Family Planning Growth Monitoring CDD Corner/ Rehydration Centre Health Education Home Visits	Poor
Kariobangi H/Centre	Health	NIL	37	Immunisation Ante-natal Care	Poor

(Mathare Division)	Centre			Family Planning Growth Monitoring	
Kasarani Dispensary (Mathare Division)	Dispensary	NIL	18	NONE	Poor
Mathare North H/C (Mathare Division)	Health Centre	24	48	Immunisation Ante-natal Care Family Planning Growth Monitoring Health Education Home visits	Fair
Ruaraka Clinic (Mathare Division)	Clinic	NIL	9	Immunisation Ante-natal Care Family Planning Growth Monitoring Health Education Home visits	Good

Source: Health Information System (HIS)

**Table 5.7. NCC Facilities' Manpower**

Facility	Docs	Sisters	Nurses	COs	Lab Techs	Admin	Records	Clerical	Substaff
Kariobangi	0	0	19	3	0	5	0	3	5
Huruma Lions	0	0	14	0	0	1	0	0	5
Mathare North	0	1	30	1	0	8	0	3	5
Baba Dogo H/C	0	0	15	1	0	1	0	3	5
Kasarani Disp.	0	0	8	2	0	3	0	3	2
Ruaraka Clinic	0	0	6	0	0	2	0	0	1
Kahawa H/C	0	1	40	1	0	10	0	2	2
Woodley	0	1	6	0	0	1	0	0	4
Karen H/C	0	1	9	1	0	1	0	3	5
Langata H/C	0	3	30	2	0	4	0	5	17
Ngong Rd	0	1	12	1	0	2	0	1	9
Jinnah Avenue	0	1	6	0	0	0	0	0	2

Source: Survey data & Health Information System

The NCC operates 45 facilities that offer MCH/FP services, 25 of which also offer curative services, the other 20 offering exclusively MCH/FP. The main services in the MCH/FP include growth monitoring, ante-natal care, post-natal care, family planning, home visiting and vaccinations, with majority of these also offering regular health education sessions.

The NCC has five health centres in Langata all of which offer MCH/FP services, one has a maternity unit, but within Kibera location there are no NCC facilities and generally Langata division is the most underserved in the city with one curative

facility for 80,000 residents. The lack of NCC facilities in Kibera makes Kenyatta National Hospital (KNH) the most accessible facility for Kibera residents, though it is actually meant to be a national referral hospital.

In Mathare division the NCC has seven facilities six of which offer MCH/FP, two facilities have maternity wards. The presentation and analysis of the health services offered by the NCC are outlined in the table 5.6. There is one MCH/FP delivery point for every 52,000 residents as compared to Nairobi's average of one for 31,000 residents. Pumwani maternity hospital (PMH) which is easily accessible to the Mathare people with 375 beds had about 25,000 deliveries per year throughout the 1980s (1990 Annual Report). It has the majority of deliveries in the city while all other health centres with maternity wards are grossly under-utilised. For example in 1990, Pumwani had 28,440 admissions and 26,385 deliveries compared to the combined NCC maternity wards which had 2,800 admissions and 2,500 deliveries, giving an average of over 70 deliveries per bed at PMH as compared to under 16 in the health centres.

#### **5.1.2 JUSTIFICATION OF CHOICE OF RESEARCH SITE**

Kibera and Mathare slums were chosen as the study sites for a number of reasons. Firstly, the two are found in two divisions with the highest population in Nairobi province. The majority of poor people in Nairobi live in the two slums. Thus with their high densities, it meant that it was easy to get the required sample size.

Secondly, the two areas were also deemed suitable due to the fact that being in the capital city, they are the ones that seem to be most cosmopolitan in population composition. Thirdly, since it was not possible to interview the whole slum population, due to time and resource limitations, the two were ideal for being



relatively easily accessible, for they are both quite near the city centre and transport to and fro is both cheap and easily available.

## 5.2 THE STUDY DESIGN

### 5.2.1 *SAMPLING FRAME*

The population from which the sample was drawn comprised of all households in the main slums of Nairobi (including Kawangware, Kibera, Mathare and Korogocho). It was from these that the ones with the highest population density and also the most cosmopolitan in composition were purposively selected. There was no list of houses available and so it was not possible to allocate them numbers.

### 5.2.2 *SAMPLE SIZE*

In sampling, to obtain 100 percent accuracy would involve measuring the whole population, and the smaller the sample size however, the wider the margin of error made from it. Therefore a compromise between precision and economy of effort has to be struck.

If the margin of error that can be tolerated is known, it is possible to calculate the minimum sample size required, and in so doing saving time in collecting unnecessarily large sample, especially if resources are limited.

The formula is:

$$n = (zs/d)^2$$

Where:

$n$  is the required sample size,  $s$  is the standard deviation of the sample,  $d$  is the tolerable margin of error at the specified level of confidence, and  $z$  is taken from the  $z$ -table, corresponding to the given confidence level

Therefore with a standard deviation of 16, and a tolerable margin of error of 2.5 at 95 percent level of confidence, then the required sample size for this study worked out to be:  $n = (2 \times 16/2.5)^2 = \underline{164}$

### 5.2.3 *SAMPLE SELECTION*

Due to the dispersed nature of the population, a straightforward random sample would have involved a great deal of travel. Therefore, cluster sampling which involves a double sampling procedure was used. This involves first, listing of all clusters followed by a selection of clusters to be studied. Secondly, a random sample within each cluster is done. The clusters listed were Kibera, Huruma, Mathare, Korogocho and Kawangware and from these, the representative clusters selected were Kibera and Mathare, and from these, a sample of 164 households was drawn, 82 from each of the two slums.

This procedure was the best alternative in the absence of a household register from the central bureau of statistics (CBS) to get the random numbers table, and since the areas were all slums, they were basically not distinct and so were assumed representative of the rest of the slums.

### 5.3 DATA COLLECTION INSTRUMENTS

#### 5.3.1 *THE QUESTIONNAIRE*

The study used mainly primary data from a household survey, but some secondary data was also used especially on workload and maternal mortality, from the facilities and from the Ministry of Health's health information system (HIS).

The questionnaire used (see appendix ii) had seven sections which included socio-demographic characteristics, household variables, household income, assets, consumption/ expenditure, perceived quality of care and willingness to pay.

In the first section, the mothers were asked about the household member's age, sex, marital status, highest education level attained, main occupation and religion. The second section included questions on whether ante-natal care was sought, where it was sought, travel time, waiting time and costs such as user fee per visit, transport, drugs and ante-natal related tests. The third section sought information on household income, assets, consumption/expenditures and finally the women's perceived quality of care as well as their willingness to pay for the services.

#### 5.3.2. *INTERVIEWS*

The interviews were conducted between July and August 1997, starting with Kibera and then Mathare, and were done on a household basis. From the household selected for the interviews, the mother was picked for the interview as she was the one who sought the ante-natal care.

The questionnaires that were administered to the households were in English and for a number of respondents the questions had to be translated into Kiswahili for

ease of communication. Some of the respondents were finding the subject matter rather sensitive, especially the elderly who felt uncomfortable discussing such matters with a much younger respondent. These women could not respond as enthusiastically as expected, and only relaxed when assured that the exercise was for academic purposes only, majority however did not mind.

#### 5.4 LIMITATIONS OF THE SAMPLE

As stated earlier, resource constraints meant that a population study was not possible, but that was not the only problem faced during the survey. Another problem was that not all the selected households had young children, and so such households had to be skipped to the next on the sequence. In some households the mothers were quite unfriendly and totally refused to co-operate, these too had to be skipped. Others were busy with housework and could only afford brief moments, while others expected some payment.

There was also the problem that most research lately have tended to concentrate on slum areas and most of the women were tired of being asked questions. For example a week prior to this study, there had been researchers in Kibera on Family Planning (FP) and knowledge attitude and practice (KAP).

Another limitation is that some women found the questions on reproductive health rather sensitive, while others had problems communicating in Kiswahili, and preferred their mother-tongue which was a problem to the interviewer. Finally there was also the problem of recall especially on the ante-natal visits, as well as the quantities consumed in the last month, other women were not apparently honest on the question of smoking and alcohol consumption.

**DESCRIPTIVE AND EMPIRICAL RESULTS**

**6.0 INTRODUCTION**

This chapter describes the sample collected including the socio-economic characteristics of the respondents. The chapter also presents the regression results, including estimates of the parameters for the demand model that was earlier discussed in chapter 3, and also discusses various policy implications of the results obtained.

**6.1 DESCRIPTIVE RESULTS**

Table 6.1 presents the descriptive statistics. From the 160 women interviewed (4 questionnaires were discarded), it was found that their ages ranged from 17 to 45, with an average age of 27.6 years. The household size varied from 2 to 8 persons with the average household size of 3.8 persons.

**Table 6.1. Socio-Economic, and other Characteristics**

Age	Maximum	45
	Minimum	17
	Average	27.6
Travel Time	Maximum	120
	Minimum	1
	Average	27.6
Waiting Time	Maximum	120
	Minimum	0
	Average	49.7
Transport Cost	Maximum	60
	Minimum	0
	Average	6.5
User Fee	Maximum	300
	Minimum	0
	Average	15
Drug Cost	Maximum	500
	Minimum	0
	Average	5.25
Cost of Tests	Maximum	1000
	Minimum	0
	Average	77.0

Value of Assets	Maximum	2,973,000
	Minimum	500
	Average	94,084
Consumption/Expenditure	Maximum	33,000
	Minimum	2,790
	Average	7,188
Household Income	Maximum	62,000
	Minimum	1,000
	Average	5,609
Household Size	Maximum	8
	Minimum	2
	Average	3.756

Source: Survey Data

**Table 6.2. Women's Marital Status**

<b>Marital Status</b>	<b>Count</b>	<b>%</b>
Married	123	77.0
Single	22	14.0
Divorced	2	1.3
Widowed	6	3.8
Separated	7	4.4
<b>TOTAL</b>	<b>160</b>	<b>100.0</b>

Source: Survey Data

77% of the respondents were married, 14% single and the rest 9% were either divorced, separated or widowed (Table 6.2), implying that 23% of the households were headed by women. 95% of the women had either primary or secondary education, 4.4% had none or attended adult education while only 0.6% had college education. 93% of the household heads, had either primary or secondary education, while 4.5% had high school education and above with the remaining 3.2% either having none or attended adult education (Table 6.3).

**Table 6.3. Highest Education Level Attained**

Level of Education	Mother's		Household Head's	
	Count	%	Count	%
None	6	3.8	2	1.3
Adult Education	1	0.6	3	1.9
Primary	96	60.0	70	44.0
Secondary	56	35.0	78	49.0
High School	0	0	3	1.9
College	1	0.6	2	1.3
University	0	0	2	1.3
<b>TOTAL</b>	<b>160</b>	<b>100.0</b>	<b>160</b>	<b>100.0</b>

Source: Survey Data

It was found that the majority of the women were housewives comprising of 63.8%, with another 21.3% being traders and only about 14% were employed. 34.4% of the household heads were employed as casuals workers and 23.8% were traders (Table 6.4).

**Table 6.4. Mother's & Household Head's Main Occupation**

Occupation	Mother's		Household Head's	
	Count	%	Count	%
Unemployed	1	0.6	3	1.9
Private	5	3.1	31	19.4
Civil Servant	7	4.4	23	14.4
Casual	11	6.9	55	34.4
Trader	34	21.3	38	23.8
Housewife	102	63.8	7	4.4
Other	0	0	3	1.9
<b>TOTAL</b>	<b>160</b>	<b>100.0</b>	<b>160</b>	<b>100.0</b>

Source: Survey Data

It was found that members from a particular household belonged to the same religion, but generally majority of them were Christians, with 34.4% Protestants and 31.9% Catholics. The Moslems were 11.9% while the rest made up the remaining 21.8% (see Table 6.5).

**Table 6.5. Households' Religion**

<b>Religion</b>	<b>Household's</b>	
	<b>Count</b>	<b>%</b>
None	1	0.6
Other	34	21.3
Moslem	19	11.9
Protestant	55	34.4
Catholic	51	31.9
<b>TOTAL</b>	<b>160</b>	<b>100.0</b>

Source: Survey Data

**Table 6.6. Number of Ante-natal Visits**

<b>Number of Visits</b>	<b>Frequency</b>	<b>%</b>
20	1	0.3
12	1	0.3
10	1	0.3
9	33	11.0
8	2	0.7
7	6	2.0
6	18	6.0
5	62	20.6
4	83	27.6
3	68	22.6
2	24	8.0
1	2	0.7
<b>TOTAL</b>	<b>301</b>	<b>100.0</b>

Source: Survey Data

**Table 6.7. Persons Accompanying Mother to the Clinic**

<b>Persons Accompanying Woman</b>	<b>Number of Visits</b>	
	<b>Count</b>	<b>%</b>
2	5	1.7
1	4	1.3
0	292	97.0
<b>TOTAL</b>	<b>301</b>	<b>100.0</b>

Source: Survey Data

From the group of 160 women, majority said they visited an ante-natal clinic at least once, with the highest number of visits being 20. 70.8% made between 3 to 5, 97% were unaccompanied to the facilities, 74% of the women sought ante-natal



care at government facilities, with 11.3% visiting private and another 10.3% visiting mission clinics (see table 6.8).

**Table 6.8. Facilities Visited For Ante-natal Care**

<b>Facility</b>	<b>Count</b>	<b>%</b>
Other	1	0.3
Herbalist	1	0.3
Home Remedies	1	0.3
Mission Dispensary	12	4.0
Mission Hospital	19	6.3
Private Dispensary	29	9.6
Private hospital	5	1.7
Government Dispensary	11	3.7
Government Health Centre	157	52.0
Government Hospital	65	22.0
<b>TOTAL</b>	<b>301</b>	<b>100.0</b>

Source: Survey Data

Travel time ranged from five minutes to two hours, with an average travel time of 27.6 minutes. Waiting time ranged from zero to two hours with an average of 49.7 minutes.

The respondents spent on average Kshs 6.50 on transport, Kshs 15 on user-fees, Kshs 5.25 and Kshs 77 on ante-natal related tests.

The women were also asked about the total value of their household assets, and the values averaged about Kshs 94,000, the reason for this high value was due to the fact that these included even assets in their rural homes. The average value of the household's consumption/expenditures was Kshs 7,188, while the average household income was Kshs 5,609 Kshs.

Tables 6.9 to 6.11 show the women's ratings on their perceived quality of care for various aspects at the facilities.

Table 6.9.  
**Women's Perception of Staff Attitude, Cleanliness & Quality of Equipment**

	<b>Staff Attitude</b>		<b>Cleanliness</b>		<b>Quality of Equipment</b>	
	Count	%	Count	%	Count	%
Don't Know	1	0.6	1	0.6	44	27.5
Poor	9	5.6	8	5.0	4	2.5
Fair	53	33.1	55	34.4	37	23.1
Good	83	51.9	80	50.0	68	42.5
Very Good	12	7.5	14	8.8	5	3.1
N/A	2	1.3	2	1.3	2	1.3
<b>TOTAL</b>	<b>160</b>	<b>100.0</b>	<b>160</b>	<b>100.0</b>	<b>160</b>	<b>100.0</b>

Source: Survey Data

Table 6.10. **Women's Perception of Adequacy & Qualification of Personnel**

	<b>Qualification of Health Personnel</b>		<b>Adequacy of Staff</b>	
	Count	%	Count	%
Don't Know	1	0.6	25	15.6
Poor	9	5.6	5	3.1
Fair	53	33.1	37	23.1
Good	83	51.9	84	52.5
Very Good	12	7.5	7	4.4
N/A	2	1.3	2	1.3
<b>TOTAL</b>	<b>160</b>	<b>100.0</b>	<b>160</b>	<b>100.0</b>

Source: Survey Data

Table 6.11.  
**Women's Perception of Privacy, Drug Availability & Overall Quality of Service**

	<b>Level of Privacy</b>		<b>Drug Availability</b>		<b>Overall Quality</b>	
	Count	%	Count	%	Count	%
Don't Know	1	0.6	9	5.6	14	8.8
Poor	18	11.3	19	11.9	67	41.9
Fair	69	43.1	63	39.4	65	40.6
Good	65	40.6	65	40.6	6	3.8
Very Good	5	3.1	2	1.3	6	3.8
N/A	2	1.3	2	1.3	2	1.3
<b>TOTAL</b>	<b>160</b>	<b>100.0</b>	<b>160</b>	<b>100.0</b>	<b>160</b>	<b>100.0</b>

Source: Survey Data

From the 160 women interviewed, 51.9% rated staff attitude as good and another 33.1% as fair none rated it as excellent. 34.4% and 50.0% rated cleanliness as either fair or good respectively. When asked about their perception of the quality of equipment, 44.5% and 23.1% rated it as fair or good while another 27.5% said the don't know (Table 6.9)

52.5% rated adequacy of staff as good, 23.1% as fair and 15.6 did not know how to rate it, while 33.1% and 59.4% rated qualification of staff as fair or good and very good respectively and on the level of privacy, 11.3% rated it as poor, 43.1% as fair and 40.6% as good (Table 6.10). 11.9% rated drug availability as poor, 39.4% as fair and 40.6 as good. 8.8% rated overall quality at the facility as poor, 41.9% as fair and 44.4% as either good or very good. Generally a notable observation is that there was no excellent rating in any of the categories above.

About 88.75% of the respondents expressed willingness to pay for services. Though generally the PMO and NCC facilities do not charge for the ante-natal services, the women were asked to state the maximum amount they would be willing to pay given the services available in the ante-natal care package. 6.3 % were not certain, 12.5% were not willing to pay anything as long as its a government facility, 25.0% were willing to pay Kshs 20, 69.5% were willing to between Kshs 10 and Kshs 50. Only 7.5% of those interviewed were willing to pay Kshs 100 (see Table 6.12 below).

**Table 6.12. Willingness to Pay for Ante-natal Services**

<b>Amount (Kshs)</b>	<b>Count</b>	<b>%</b>
Not Certain	10	6.3
100	12	7.5
80	4	2.5
60	3	1.9
50	32	20.0
40	11	6.9
30	14	8.8
20	40	25.0
10	14	8.8
0	20	12.5
<b>TOTAL</b>	<b>160</b>	<b>100.0</b>

Source: Survey Data

## 6.2 REGRESSION RESULTS

The regression results (coefficients, standard deviations, t-values and p-values) are presented in table 6.13. The signs of the estimated parameters for the explanatory variables tell us the direction of change of the dependent variable due to change in the particular variables, while the value of the parameter gives the magnitude of this change relative to the change in the explanatory variable.

**Table 6.13. Regression Results for the Demand for Ante-natal Care**

<i><b>Explanatory Variable</b></i>	<i><b>Coefficient</b></i>	<i><b>Standard Error</b></i>	<i><b>t Stat</b></i>
Intercept	-4.592746	1.985741	<b>-2.313 **</b>
AGE	0.104705	0.225909	0.463
UFEE	-0.007972	0.11653	-0.684
DRUGC	0.014857	0.024091	0.617
CONEXP	0.052250	0.197608	0.264
HHINC	0.341998	0.178901	<b>1.912 *</b>
HHSIZE	-0.037071	0.341175	-0.109
OVQUAL	0.153719	0.158149	0.972
MSTAT	0.213826	0.192136	0.557
MEDUC	0.213826	0.192136	1.113
HHEDUC	-0.179775	0.189150	-0.950
MOCP	0.018322	0.204734	0.089
HHOCP	-0.119136	0.405800	-0.294
REL	0.017471	0.170860	0.102
TRVTM	0.266855	0.066721	<b>4.000 **</b>
WAITM	0.440450	0.040423	<b>10.896 **</b>
TRANC	0.005192	0.012908	0.402
ANCTES	0.006679	0.009942	0.672

**\*\* Statistically significant at 5% level**

**\* Statistically significant at 10% level**

Multiple R	0.80204	Standard Error	0.94568
R Square	0.64327	Observations	160
Adjusted R Square	0.60056	F	15.06245
DF	141		

**Source: Survey Data**

From the regression, the parameters of the explanatory variables were obtained, and these explain the effect of each variable on the demand for ante-natal care. The t-statistic gives the value corresponding to the null hypothesis that the true value of a parameter is zero, while the p-value indicates the minimum level of significance at which the estimated variable is statistically significant.

The results suggest that overall the explanatory variables explain about 64.3% of the variation in the demand for ante-natal care.

The Table above shows that most parameter estimates have signs that are consistent with those generally hypothesised earlier. The results suggest that Income, Mother's education, User-fee, Drug costs, Time costs and Perceived quality are important determinants of the demand for ante-natal care, as the coefficients of these are significant at 10% level and those of Income and Time costs at 5% level.

The coefficient of Income has the expected positive sign. Thus, an increase in the household income would lead to an increase in the demand for ante-natal care. The coefficient of Consumption/Expenditure is positive, implying that an increase in consumption and expenditure could be an indication of the ability to meet the costs in seeking ante-natal care.

Results also show that an increase in user-fees would decrease the utilisation of the ante-natal care services, while an increase in either the mothers education or perceived quality of care would increase utilisation, and as can be noted, the estimated parameters are statistically significant implying that a slight change in either of these variables would have a consequential change in the demand for the ante-natal care.

As expected from the hypothesised relationships, given results from previous studies, the perceived quality of service has a positive sign implying that the higher the women perceive the quality, the higher will be their utilisation of the ante-natal care.

The coefficient of household size also had a negative sign implying that mother with large families tended to utilise the ante-natal services less than those with smaller families, while at the same time the results indicated that the age of the mother influenced the demand positively as hypothesised, in that the more mature the mother the more she is likely to seek ante-natal care.

Some variables that gave different signs from those hypothesised included the education and occupation of the household head as well as the drug cost. The education/occupation of the household head would have been expected to have a positive coefficients, while that of the drug was expected to have a negative sign but the results indicated otherwise.

The coefficient of income indicates the income elasticity of demand while that of price (user fee) indicates the price elasticity of demand. Elasticity is generally a measure of responsiveness change in a variable due to a change in another variable. From the regression results, both elasticity coefficients for the two price variables (travel and money) ; travel time (0.266855) and price (-0.007972) are quite low especially that of price, thus any change in either travel time or money price would only have a negligible effect on the demand.

As for the elasticity coefficient of income (0.341998), it is statistically significant indicating that a change in income would result in a considerable change in the

demand for the ante-natal care. This implies that if the ante-natal care utilisation was to be increased, then, focusing on raising of peoples incomes would therefore be an appropriate target for the policy makers aiming to influence demand.

Further regressions using the willingness to pay (WTP) as the dependent variable were performed and they did not yield statistically significant results except for religion, indicating that some women (in this case the non-Catholics) would be more unwilling to pay, if the government facilities were to charge for antenatal care services.



**CONCLUSION AND RECOMMENDATIONS****7.0 INTRODUCTION**

This study examined the determinants of demand for ante-natal care in the slums of Nairobi. The study focused on effects of certain characteristics (socio- economic, facility and policy characteristics) on the utilisation of ante-natal care. The results of the study are expected to be useful to the planners and policy makers in ante-natal care delivery.

The study used mainly primary data collected through a household survey of 164 households in Kibera and Mathare slums. This chapter outlines the conclusions of the study and also makes certain policy recommendations.

**7.1 CONCLUSIONS**

From the study, there were a number of findings from which various conclusions could be drawn. For instance it was established that most women visited government facilities for ante-natal care services. This could be due to the fact that these facilities do not charge user-fee, and the government could increase the utilisation even further if the access to the facilities was improved, probably by reducing waiting time or opening more facilities closer to the people.

The results indicate that the mother's education does influence the ante-natal care demand positively, though not significantly but nevertheless effort should be made to discourage girls from dropping out of school early. Results suggest that quality of care is vital for increased utilisation of ante-natal care, and this simply implies that with improved quality of care, more women are likely to seek the ante-natal care.

It was also established that user-fee had a negative effect on the utilisation and the idea here should be to continue offering this form of service free of charge at the point of use, especially since the women are not able to foresee the benefits unlike in the case of curative care. Household income also influenced the utilisation positively indicating that if the incomes of the people could be raised, there is a strong likelihood that the utilisation levels would rise resulting to reduced risks that arise from lack of ante-natal care for both mother and child.

Travel time was found to have a positive influence, implication here being that travel time did not discourage the utilisation and so having more facilities closer to the people though a good idea should not be an immediate priority but rather target other aspect such as quality of care. This was especially true for the study area where the population per facility was quite high.

The age of the mother was also found to be an important factor influencing the utilisation of ante-natal care, the implication being that the younger the mother the less she is likely to perceive the need for ante-natal care for her and her child.

Another finding was that women whose household size was big tended to utilise the ante-natal service less, the reason here may not be clear, but for one it may be due to having too many responsibilities to afford time to attend the clinics. Secondly it could be due to earlier experience that may have been discouraging with long waiting time, poor service, or even normal deliveries without having sought care, and so not regarding the care as necessary.

Marital status also tended to impact on the demand positively, this could be due to shared responsibilities allowing the mother time to seek care unlike for the single mother with all the household responsibilities, and probably with nobody to advise her on the need for this form of health care.

Results also suggest that the occupation of the mother influences the demand positively, here it can be concluded that for a working mother, she is able to afford the user-fee, and where its free, she can afford the transport costs to the facility of her choice.

## 7.2 RECOMMENDATIONS

- The government should try and open up more facilities closer to the people, even if it is just clinics offering only MCH/FP, as the majority of women sought care in government facilities, implies.
- The government should try and maintain the provision of free services especially for the ante-natal care and for other preventive and promotive health care services, since the women may not foresee the benefits of ante-natal care unlike in the case of curative care. Other providers such as NGOs should also be encouraged to supplement the governments effort in this area of health care.
- The government should try and provide incentives to the young females to pursue education and at the same time try and discourage parents from marrying off their daughters early.

- Every effort should be made to ensure that the quality of care was kept as high as possible, the fee collected from other services could be invested in improving the overall quality of the facilities, this would entail improvement in the availability of drugs, quality of equipment as well as the general cleanliness of the facilities.
- By improving the quality of care, the government can prompt the women realise that the ante-natal experience may after all be very useful and so be encouraged to continue seeking it for all their children.
- Some form of incentives should also be found to try and motivate the staff as their attitude is part of the quality of service.
- Effort should be made to raise the people's incomes, with the hope that this would trigger more demand for the ante-natal services. The government could play a key role here by initiating development projects that target the poor, to try and give them some form of livelihood.
- More clinics should be put up closer to the people, and the health personnel make more home visits, as travel time tends to discourage utilisation, thus the government should try and reduce this as much as possible. This should prove very effective especially for the study area where the population per facility was quite high.

- The adolescent females and males should be provided with information, education and counselling to help them delay early family formation, premature sexual activity and first pregnancies.
- The government should, as a matter of urgency, needs to seek changes in high-risk sexual behaviour and devise strategies to ensure that men share responsibility for sexual and reproductive health, including family planning, and this will also go a long way in preventing and controlling sexually transmitted diseases, HIV infection and AIDS.
- The government should continue with the current effort of encouraging couples to have smaller families through the family planning exercise and programmes of education to engage men's support for maternal health and safe motherhood should be developed.

It should however be emphasised that the demand for health approach provides only part of the information required by policy makers, it provides information on only the benefits of particular policy measures. It therefore should be used in conjunction with other tools, such as cost-benefit and cost-effectiveness analysis (Wagstaff, 1986).

### 7.3. SUGGESTIONS FOR FURTHER RESEARCH

As noted above, a number of limitations were experienced in this study, which included time and resource constraints, limiting not only the sample size but also the composition, and in light of these, the following recommendations are made for further research in the demand for ante-natal care.

Since the data used in this study was limited to a small area of the country (two slums in Nairobi) and considered only one category of mothers (slum dwellers). I would recommend for a nation wide study considering all kinds of mothers from every locality, i.e., from both rural and urban, as well as both rich and poor, to enable comparisons between various classes of people as well as regions within the country.

There is need for further research into factors that influence the mother's first ante-natal visit, a factor that this study did not capture, but nevertheless a very critical one for not only does it to a great extent influences subsequent visits, it also demonstrates the extent of awareness of the mothers of the existence of ante-natal care.

More research is necessary especially including multiple visits and other related maternal health services such as family planning, postnatal care etc. in the estimation of the model.

There should also be some evaluation of the effect of the provision of free antenatal services to the pregnant women on the health services themselves as well as on the staff motivation.

A number of the variables used in this study were statistically insignificant, and considering that other variables gave different signs from the hypothesized ones, there is need for verification from a larger sample size. The study had higher explanatory powers for some variables relative to some earlier studies such as one by Ndele (1988), but the results are still not conclusive and there is still plenty of room for improvement. Therefore, a broader study on the factors influencing the demand for ante-natal care in Kenya is a necessity.

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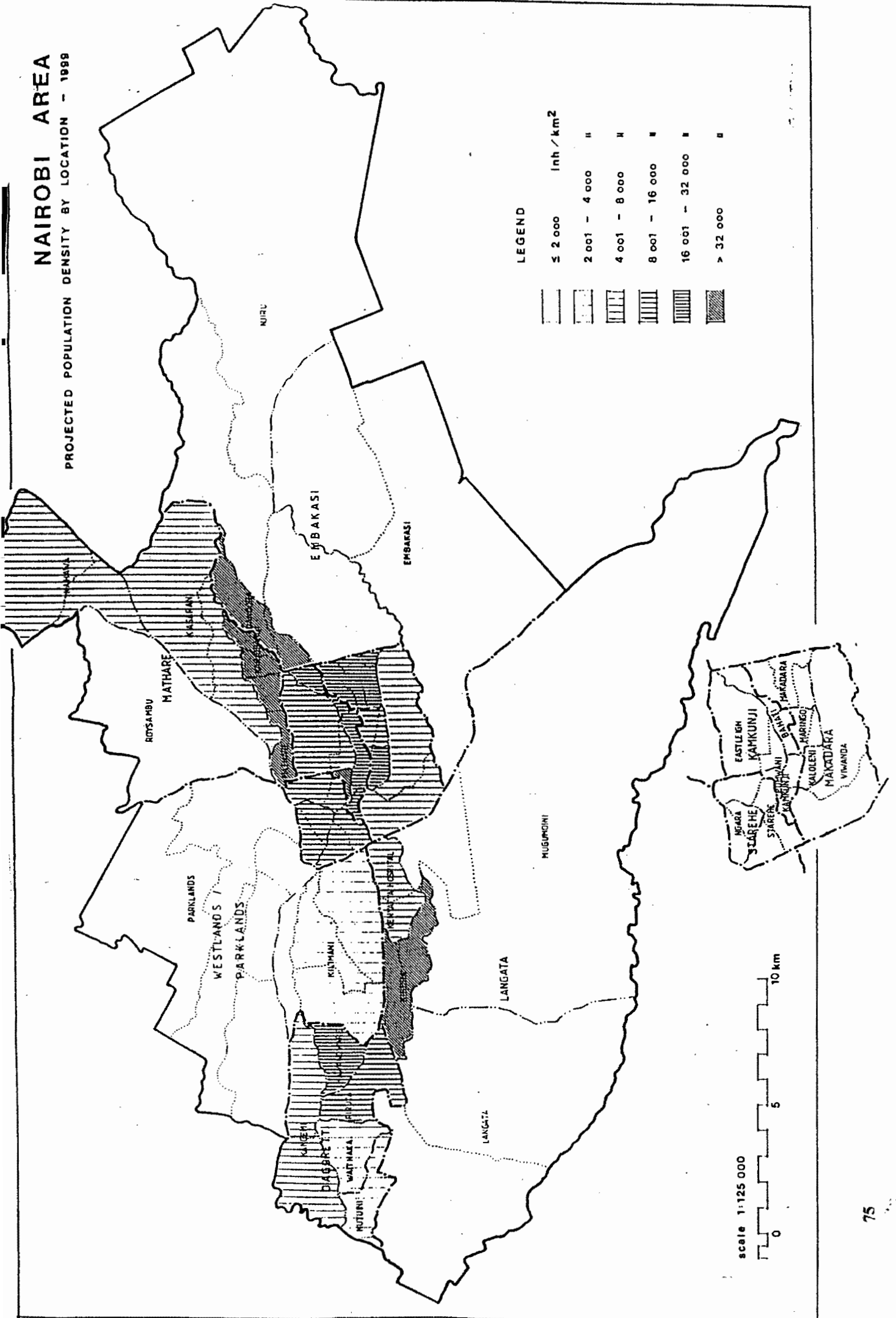
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# NAIROBI AREA

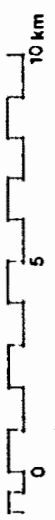
PROJECTED POPULATION DENSITY BY LOCATION - 1989



## LEGEND

Symbol	inh / km <sup>2</sup>
[White box]	≤ 2 000
[Horizontal lines]	2 001 - 4 000
[Vertical lines]	4 001 - 8 000
[Diagonal lines (top-left to bottom-right)]	8 001 - 16 000
[Diagonal lines (top-right to bottom-left)]	16 001 - 32 000
[Cross-hatch]	> 32 000

scale 1:125 000



**APPENDIX ii**  
**QUESTIONNAIRE**

**HOUSEHOLD SURVEY**

1. TYPE OF QUESTIONNAIRE: Household Survey:
2. DATE OF INTERVIEW: \_\_\_\_\_
3. INTERVIEWERS NAME: \_\_\_\_\_
4. NAME OF RESPONDENT: \_\_\_\_\_
5. TIME INTERVIEW STARTED: \_\_\_\_\_ A.M./P.M.
6. TIME INTERVIEW ENDED: \_\_\_\_\_ A.M./P.M.
7. NAME OF AREA: \_\_\_\_\_
7. HOUSEHOLD NUMBER: \_\_\_\_\_

**INTRODUCTION**

I am a postgraduate student at the University of Cape Town South Africa, carrying out a research for my Msc. Dissertation on Demand for Ante-natal care (health care that is offered to women who are in pre-pregnancy and pregnancy states with the aim of facilitating a normal pregnancy, safe delivery and a healthy childhood).

The information I will collect and findings of the research are purely for academic purposes. The details you give about yourself will not be diverted elsewhere. It will be treated strictly confidential.

**PART I: SOCIO-DEMOGRAPHIC CHARACTERISTICS**

List all the members of the household starting with the household head (enter the appropriate codes in the table below)

Household members names	Household members AGE	Household members SEX	Household members MARITAL STATUS	Highest education attained	Main Occupation	Household members RELIGION
1						
2						
3						
4						
5						
6						
7						
8						
9						
10						

**CODES TO BE USED IN PART I ABOVE**

SEX	MARITAL STATUS	HIGHEST EDUCATION	OCCUPATION	RELIGION
0 = Female 1 = Male	1 = Married 2 = Single 3 = Divorced 4 = Widowed 5 = Separated	1 = University 2 = College 3 = High School 4 = Secondary 5 = Primary 6 = Adult Literacy 7 = None	1 = Farmer 2 = Housewife 3 = Trader 4 = Casual Worker 5 = Civil Servant 6 = Private sector employee 7 = Student 8 = Unemployed 9 = Other (specify) 00 = Missing	1 = Catholic 2 = Protestant 3 = Moslem 4 = Hindu 5 = Other 6 = None

**PART II: HOUSEHOLD HEALTH VARIABLES**

Persons Number	Was ante-natal care sought? (for each member) 1 = Yes 0 = No (If No use code A)	No. of ante-natal care visits	Where was the ante-natal service sought (use code B)	No. of persons accompanying the care seeker to the health facility	Travel time per visit (minutes)	Waiting time per visit (minutes)	Transport cost per visit (Ksh)	User fees per visit (Ksh)	Cost of drugs per visit (Ksh)	Costs of ante-natal care related tests (Ksh)
1.										
2.										
3.										
4.										
5.										
6.										
7.										
8.										
9.										
10.										
11.										
12.										

CODE A	CODE B
01 = Too expensive 02 = No time 03 = No knowledge of service 04 = Service useless 05 = No reason 06 = Other (specify)	00 = None 01 = Government hospital 02 = Government Health Centre 03 = Government Dispensary 04 = Private Hospital 05 = Private Dispensary/Clinic 06 = Mission Hospital 07 = Mission Dispensary / clinic 08 = Chemist / Pharmacy 09 = Shop medicine 10 = Home remedies 11 = Traditional spiritual healer 12 = Religious spiritual healer 13 = Herbalist 14 = other (specify)

### PART III: HOUSEHOLD ASSETS

Does your household own any of the following assets? Please give me the quantities of those assets.  
 (DO NOT ASK THE RESPONDENTS FOR PRICES)

Name of asset	Quantity	Price per unit of asset (Ksh)
Land (in acres)		
Cattle		
Goats		
Sheep		
Donkeys		
Ox or donkey drawn ploughs		
Chicken		
Radio/record player		
Tractor		
Motor vehicle		
House 1= permanent (stone) 2= semi-perm. (timber) 3= temporary (carton/polythene) 4= none		
Other Assets (specify)		



<b>PART IV: HOUSEHOLD CONSUMPTION/EXPENDITURES</b>			
What items did you spend your money on last month?	How much did you pay?	How many times per month?	Are there things you got in kind last month ? How much did you get in kind ?
A. Rent			
B. Food			
C. Soap			
D. Salt			
E. Clothing			
F. Shoes			
G. Kerosene/Cooking gas			
H. Wood/charcoal			
I. Water			
J. Electricity			
K. Housewares			
L. Gifts			
M. School fees			
N. Transport except health			
O. Bicycle/Car			
P. Breakfast			
Q. Repay debt			
R. Petrol			
S. Toiletries			
T. Taxes			
U. Drinks (beer)			
V. Tobacco			
W. Family celebrations			
X. Mourning & mortuary			
Y. Construction materials			
Z. Other (specify)			

**PART V: HOUSEHOLD INCOME**

How much income does your house hold earn from the following sources per month ?

Source of income	Amount of income per month (Ksh)
Business (shop, kiosk, matatu)	
Coffee	
Tea	
Sugarcane	
Milk	
Household head's salary	
Wife's salary	
Reinittances from children/ relatives	
Pension/interest income	
Others (specify)	

**PART VI: PERCEIVED QUALITY OF CARE**

How would you rate the following? ( In the last facility visited for the ante-natal care)

Service/Aspect	Excellent	V. Good	Good	Fair	Poor	Don't Know
Staff Attitude						
Cleanliness						
Quality of equipment						
Qualification of health personnel						
Adequacy of the number of health personnel						
Level of privacy						
Drug availability						
Overall quality of service						

**PART VII: WILLINGNESS TO PAY**

*Description of the Ante-natal Care Commodity being valued*

Ante-natal care offered in your nearest government health facility includes the following services:

- Ascertaining adequate growth and well-being of the foetus.
- Prevention of infection in the mother.
- Checking for pre-existing disorders.
- Checking for the disorders of pregnancy.
- Checking for presentation/abnormality of lay in the foetus.
- Identification of the “at risk mother”

Because the Ministry of Health needs to know the value users attach to the above mentioned services , we would like to ask you some questions which would enable us to determine their value.

(a) Would you be willing to pay some money for the use of above mentioned ante-natal services in your nearest government health facility? 1 = Yes; 0 = No: \_\_\_\_\_

If Yes, proceed to question (b). If No, stop here.

(b) Would you be willing and able to pay the following amounts in your nearest government health facility?

- Ksh. . 10 ..... (Yes/No)
- Ksh. . 20 ..... (Yes/No)
- Ksh. . 30 ..... (Yes/No)
- Ksh. . 50 ..... (Yes/No)

(c) What is the maximum amount of money would you be willing and able to pay for the ante-natal services in the nearest government health facility? \_\_\_\_\_  
 Unsure \_\_\_\_\_

APPENDIX iii

ADDITIONAL RESULTS  
REGRESSION RESULTS ON WILLINGNESS TO PAY

DEPENDENT VARIABLE: Willingness to pay [WTP]: Equals 1 if woman is willing to pay, otherwise is zero

<i>Explanatory Variable</i>	<i>Coefficient</i>	<i>Standard Error</i>	<i>T- Stat</i>
CONSTANT	0.868974	0.716081	1.214
ANTVIS	-0.027563	0.029707	-0.928
AGE	-0.034528	0.080033	-0.431
UFEE	3.12E-04	0.004132	0.075
DRUGC	0.008133	0.00854	0.952
CONEXP	0.003879	0.069972	0.055
HHINC	0.023461	0.064142	0.366
HHSIZE	-0.030045	0.120783	-0.249
OVQUAL	0.055925	0.056171	0.996
MSTAT	-0.029325	0.102893	-0.285
MEDUC	-0.006185	0.068313	-0.091
HHEDUC	-0.042487	0.067173	-0.633
MOCP	0.033808	0.072479	0.466
HHOCP	0.048086	0.143699	0.335
REL	-0.108478	0.060488	-1.793 *
TRVTM	0.004107	0.024915	0.165
WAITM	0.012646	0.01939	0.652
TRANC	-3.34E-04	0.004572	-0.073
ANCTES	4.95E-04	0.003525	0.14

\*\* Statistically significant at 5% level

\* Statistically significant at 10% level

Multiple R	0.23711	F = 0.46664
R Square	0.05622	
Adjusted R Square	-0.06426	
Standard Error	0.33477	

Source: Survey Data

REGRESSION RESULTS ON WILLINGNESS TO PAY (Cont.)

DEPENDENT VARIABLE: Willingness to pay 10 Kshs (WTP10): Equals 1 if woman is willing to pay 10 Kshs, otherwise is zero

<i>Explanatory Variable</i>	<i>Coefficient</i>	<i>Standard Error</i>	<i>T- Stat</i>
CONSTANT	0.868974	0.716081	1.214
ANTVIS	-0.027563	0.029707	-0.928
AGE	-0.034528	0.080033	-0.431
UFEE	3.12E-04	0.004132	0.075
DRUGC	0.008133	0.00854	0.952
CONEXP	0.003879	0.069972	0.055
HHINC	0.023461	0.064142	0.366
HHSIZE	-0.030045	0.120783	-0.249
OVQUAL	0.055925	0.056171	0.996
MSTAT	-0.029325	0.102893	-0.285
MEDUC	-0.006185	0.068313	-0.091
HHEDUC	-0.042487	0.067173	-0.633
MOCP	0.033808	0.072479	0.466
HHOCP	0.048086	0.143699	0.335
REL	-0.108478	0.060488	-1.793 *
TRVTM	0.004107	0.024915	0.165
WAITM	0.012646	0.01939	0.652
TRANC	-3.34E-04	0.004572	-0.073
ANCTES	4.95E-04	0.003525	0.14

\*\* Statistically significant at 5% level

\* Statistically significant at 10% level

Multiple R	0.23711	F = .46664
R Square	0.05622	
Adjusted R Square	-0.06426	
Standard Error	0.33477	

Source: Survey Data

REGRESSION RESULTS ON WILLINGNESS TO PAY (Cont.)

DEPENDENT VARIABLE: Willingness to pay 20 Kshs (WTP20): Equals 1 if woman is willing to pay 20 Kshs, otherwise is zero

<i>Explanatory Variable</i>	<i>Coefficient</i>	<i>Standard Error</i>	<i>T- Stat</i>
CONSTANT	1.284799	0.943722	1.361
ANTVIS	0.002988	0.039151	0.076
AGE	0.019613	0.105476	0.186
UFEE	0.005473	0.005446	1.005
DRUGC	0.012199	0.011255	1.084
CONEXP	-0.040706	0.092215	-0.441
HHINC	0.013747	0.084532	0.163
HHSIZE	0.120982	0.159179	0.76
OVQUAL	-0.014619	0.074028	-0.197
MSTAT	-0.169404	0.135603	-1.249
MEDUC	0.062264	0.09003	0.692
HHEDUC	-0.004554	0.088527	-0.051
MOCP	-0.096996	0.09552	-1.015
HHOCP	-0.060033	0.189381	-0.317
REL	-0.116773	0.079716	-1.465
TRVTM	-0.003937	0.032835	-0.12
WAITM	-0.016556	0.025554	-0.648
TRANC	0.001153	0.006026	0.191
ANCTES	9.55E-04	0.004646	0.206

\*\* Statistically significant at 5% level

\* Statistically significant at 10% level

Multiple R	0.26346	F = 0.58429
R Square	0.06941	
Adjusted R Square	-0.04939	
Standard Error	0.44120	

Source: Survey Data

REGRESSION RESULTS ON WILLINGNESS TO PAY (Cont.)

DEPENDENT VARIABLE: Willingness to pay 30 Kshs (WTP30): Equals 1 if woman is willing to pay 30 Kshs, otherwise is zero

<i>Explanatory Variable</i>	<i>Coefficient</i>	<i>Standard Error</i>	<i>T- Stat</i>
CONSTANT	1.227425	1.057469	1.161
ANTVIS	0.083544	0.04387	1.904 *
AGE	0.026143	0.118189	0.221
UFEE	0.002039	0.006102	0.334
DRUGC	0.00665	0.012611	0.527
CONEXP	0.101947	0.10333	0.987
HHINC	-0.158191	0.094721	-1.67 *
HHSIZE	0.112114	0.178365	0.629
OVQUAL	0.047626	0.082951	0.574
MSTAT	-0.09602	0.151947	-0.632
MEDUC	0.07148	0.100881	0.709
HHEDUC	0.107939	0.099197	1.088
MOCP	-0.103756	0.107033	-0.969
HHOCP	-0.180024	0.212207	-0.848
REL	-0.197954	0.089325	-2.216 **
TRVTM	-0.03011	0.036792	-0.818
WAITM	-0.054705	0.028634	-1.91 *
TRANC	3.83E-04	0.006752	0.057
ANCTES	0.002288	0.005206	0.44

\*\* Statistically significant at 5% level

\* Statistically significant at 10% level

Multiple R	0.37192	F = 1.25751
R Square	0.13833	
Adjusted R Square	0.02833	
Standard Error	0.49438	

Source: Survey Data

REGRESSION RESULTS ON WILLINGNESS TO PAY (Cont.)

DEPENDENT VARIABLE: Willingness to pay 50 Kshs (WTP50): Equals 1 if woman is willing to pay 50 Kshs, otherwise is zero

<i>Explanatory Variable</i>	<i>Coefficient</i>	<i>Standard Error</i>	<i>T- Stat</i>
CONSTANT	0.89972	1.031607	0.872
ANTVIS	0.062674	0.042797	1.464
AGE	-0.06148	0.115298	-0.533
UFEE	0.007244	0.005953	1.217
DRUGC	0.002863	0.012303	0.233
CONEXP	0.142493	0.100803	1.414
HHINC	-0.148717	0.092404	-1.609 *
HHSIZE	0.063405	0.174003	0.364
OVQUAL	0.040468	0.080922	0.5
MSTAT	0.044833	0.148231	0.302
MEDUC	0.045404	0.098414	0.461
HHEDUC	0.050912	0.096771	0.526
MOCP	-0.0333	0.104416	-0.319
HHOCP	-0.259366	0.207017	-1.253
REL	-0.206053	0.08714	-2.365 **
TRVTM	-0.018173	0.035893	-0.506
WAITM	-0.044426	0.027934	-1.59
TRANC	-0.003838	0.006587	-0.583
ANCTES	-0.002421	0.005078	-0.477

\*\* Statistically significant at 5% level

\* Statistically significant at 10% level

Multiple R	0.34556	F = 1.06221
R Square	0.11941	
Adjusted R Square	0.00699	
Standard Error	0.48229	

Source: Survey Data

REGRESSION RESULTS ON WILLINGNESS TO PAY (Cont.)

DEPENDENT VARIABLE: Log of maximum amount one is willing to pay (WTPMax)

<i>Explanatory Variable</i>	<i>Coefficient</i>	<i>Standard Error</i>	<i>T- Stat</i>
CONSTANT	7.555887	12.636175	0.598
ANTVIS	-0.512973	0.524227	-0.979
AGE	-0.463789	1.41229	-0.328
UFEE	-0.054805	0.072917	-0.752
DRUGC	0.264143	0.150695	1.753 *
CONEXP	-1.032236	1.234739	-0.836
HHINC	0.817439	1.131862	0.722
HHSIZE	-1.746151	2.131368	-0.819
OVQUAL	0.928	0.991218	0.936
MSTAT	1.241841	1.815681	0.684
MEDUC	0.456555	1.205475	0.379
HHEDUC	-1.110204	1.185348	-0.937
MOCF	1.622814	1.278988	1.269
HHOCP	0.515335	2.535755	0.203
REL	-1.505831	1.067381	-1.411
TRVTM	-0.043505	0.439649	-0.099
WAITM	0.272447	0.342165	0.796
TRANC	0.028571	0.080682	0.354
ANCTES	-0.030419	0.062205	-0.489

\*\* Statistically significant at 5% level

\* Statistically significant at 10% level

Multiple R	0.29204	F = 0.73039
R Square	0.08529	
Adjusted R Square	-0.03148	
Standard Error	5.90752	

Source: Survey Data