HEALTH CARE FINANCING IN KENYA:

AN EMPIRICAL ANALYSIS

RACHEL KEMUNTO GESAMI

A DISSERTATION

SUBMITTED IN FULFILLMENT OF THE REQUIREMENTS FOR THE DEGREE

OF DOCTOR OF PHILOSOPHY IN THE UNIVERSITY OF NAIROBI

DEPARTMENT OF ECONOMICS

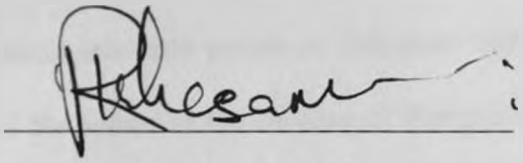
UNIVERSITY OF NAIROBI

NAIROBI, KENYA

AUGUST 2000

DECLARATION & CERTIFICATION

This thesis is my original work and has not been presented for a degree in any other university



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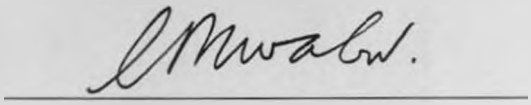

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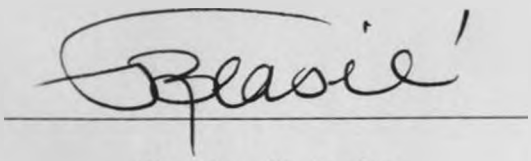

Dr. Aloys B. Ayako

DEDICATION

To my parents, my husband and our children who have always been there for me

Health Care Financing in Kenya: An Empirical Analysis

Abstract

This study was conducted against the background of concern regarding the welfare impact of introduction of user fees in government health facilities in Kenya. The introduction in 1989 of new and revised user fees in public health facilities represented a major policy change from a policy of "free" health services for all at the time of Independence. This change, together with concerns about the welfare loss it would likely engender, led in a large part to a lack of its acceptance by the public as well as a lack of political will to implement it.

The Thesis uses panel data to estimate a demand model for health care in Kenya and to assess the impact on welfare of the health care financing reform just noted. The data used covers a 10-year period – 3 years before (1986-88) and 7 years after the cost sharing reform (1989-95). Thus the data used for the analysis captures changes of the demand factors both over time as well as over the cross-section of health facilities included in the sample, which makes it possible to estimate parameters of the Kenyan medical care demand function more precisely than has been done in previous studies. Further, the data permit a comparison of the rate of health service utilization in public and private health facilities before and after cost sharing, which in turn permits a direct inspection of the effect of the cost sharing reform on medical care use.

The sample statistics show that service utilization was lower in both government and in private health facilities after the implementation of cost sharing. Demand for health services in government health facilities fell by around 33% compared to a drop of 17% in non-government facilities. The drop in medical care use was steepest in government hospitals (44%) where the fee increase was the largest. In government health centres, where fees were moderate, demand fell by 12%, while unexpectedly, in government dispensaries, where service provision continued to be free of charge, demand fell by 69%. These results suggest that interventions in one sub-sector of a medical care system can have quite unexpected effects on other parts of the system.

The regression results show that in overall terms, the *net* effect of cost sharing on health service utilization was negative, a finding that is consistent with what the sample statistics reveal. Implementation of cost sharing led to an increase in medical care demand (due perhaps to improvement in service quality), but this increase was insufficient to offset a relatively large, negative demand effect of fees (the usual price substitution effect). Distance between competing health facilities, emerges in this study, as a major determinant of demand for health services: demand for medical care is greater in facilities that are clustered together than in those that are far apart. This is perhaps because proximity among facilities enhances quality via competition and/or via the sharing of medical expertise. Proximity also increases households' knowledge about the available health services.

These findings are important in a variety of ways. For policy, they imply that caution should be taken when introducing user fees since they can lead to significant reductions in utilization of health services, particularly among the poor. They also suggest that in settings in which densities of alternative health care providers are high, such as in urban areas, the negative

demand effects of user fees can be greatly compensated for by the positive effects of quality improvement that appears to be associated with the proximity among providers.

The results further show that proper management of user fee revenues and attention to quality improvements have the effect of increasing the demand for health services. Moreover, changes in fees and in other determinants of demand in one region or district can have large effects on service quality and service use in a contiguous area. An increase in the number of doctors in Kiambu for instance (an area contiguous to Nairobi) reduces the number of visits to health facilities in Nairobi. Thus demand effects of regional spillovers of user fee changes and of other policy changes need to be considered for effective implementation of health care reforms.

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Acknowledgements

Work such as this inevitably needs guidance from many quarters. I would like to acknowledge my sincere thanks and profound gratitude to my supervisors Professor Germano Mwabu and Dr. Aloys B. Ayako for their comments, patience, meticulous guidance and encouragement all through the various phases of this work. This thesis owes its shape and substance to their sheer hard work.

My appreciation and thanks to the staff of the AERC who rendered me all the necessary assistance to enable me to successfully complete the degree programme and this dissertation. I also wish to thank the AERC for their financial support.

I wish to thank members of the Department of Economics and individuals from other institutions for their encouragement and constructive discussions that contributed to the success of this work. Special mention to Prof. Benno Ndulu, Prof. Delphin Rwegasira, Prof. William Lyakurwa, Prof. Ibrahim Elbadawi, Prof. Francis Mwega, Dr. Wafula Masai, Dr Samuel Nyandemo, Prof. Joseph Wang'ombe, Dr. Benjamin Nganda, Prof. Augustin Fosu, Benson Obonyo, Dr. Dominique Njinkeu, Moses Mwaura, Mary Michieka, Jane Omae, Edna Mokaya, James Mwangi, Jane Mayoli, Alice Wamae, Rachel Munyilu, Doris Zola and Hellen Mwaura. I am very grateful for their moral and critical comments during the entire period. I am grateful to Domisiano Mwabu for his assistance in statistical analysis and encouragement when things seemed impossible.

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beyond those of an intellectual companion, a friend and husband; his continuous source of insights and strength enabled me to feel, see and think differently, which was important in improving my work.

This work is dedicated to three groups of people, to whom it owes its existence: my parents, David Mokaya and the late Isabella Kwamboka Mokaya, who denied themselves the luxury of life to open the doors of knowledge to me and whose prayers, love and care sustained me during the most difficult times of my life; to my husband; and our children, Bridgette, Lillian, Moses, Carolyne and Michael who endured my long absence from home.

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ABBREVIATIONS

ADM	Administration
AERC	African Economic Research Consortium
AMS	Administration and Maintenance Staff
BOP	Balance of Payments
CBDs	Community-Based Distributor
CBS	Central Bureau of Statistics
CHW	Community Health Worker
CO	Clinical Officers
CSS	Clinical Support Staff
DEN	Dentists
DHMB	District Health Management Board
DOC	Doctors
FE	Fixed Effects Model
FIF	Facility Improvement Fund
FP	Family Planning
GDP	Gross Domestic Product
GLS	Generalised least-squares
GNP	Gross National Product
GOK	Government of Kenya
HIV/AIDS	Human Immuno-deficiency Virus/ Acquired Immuno-deficiency Syndrome
KHP	Key Health Personnel
KHPF	Kenya's Health Policy Framework
KMTC	Kenya medical Training College
KNH	Kenyatta National Hospital
LAB	Medical Laboratory
LDCs	Less Developed Countries
LSDV	Least Squares Dummy Variables
MCH	Maternal Child Health
MCH/FP	Maternal Child Health / Family Planning
ML	Maximum Likelihood
MOH	Medical Officer of Health

MoH	Ministry of Health
MSP	Maintenance Support
NGO	Non-Governmental Organisation
NHIF	National Hospital Insurance Fund
NHIF	National Hospital Insurance Fund
NUR	Nurses / Midwives
OLS	Ordinary Least Squares
PHA	Pharmacy
PHC	Primary Health Care
PHO	Public Health Officer
PHS	Public Health Services
PHT	Public Health Technician
PPH	Public and Promotive Health
RAD	Radiology
RE	Random Effects Model
REACH	Resources for Child Health
SUBS	Subordinate staff
TB	Tuberculosis
TBA	Traditional Birth Attendant
TES	Technology Support
THE	Therapy
USAID	United States Agency for International Development
VED	Vector Borne Diseases Laboratory
WHO	World Health Organisation

CHAPTER 1

BACKGROUND AND CONTEXT

1.1 Introduction

Countries of the Eastern and Southern Africa Regions, like the rest of less developed countries (LDCs), have been characterised by development crisis since the mid-1970s. The crisis, whose main features include low economic growth, declining personal incomes, declining savings and investment ratios, fiscal and balance of payments deficits, and external indebtedness, is attributed to both external and internal factors. Identified external factors underlying the crisis comprise declining terms of trade for these countries' primary exports, interest hikes for foreign loans, significant appreciation of hard currencies and world recession, among others. Internal factors underlying the crisis, on the other hand, include inappropriate macroeconomic policies, over-extended public sector, weak institutions, imperfect private markets, weak managerial skills in the public sector, and vulnerability to erratic weather.

The management of the development crisis in Kenya and in other countries in Eastern Africa region has, invariably, entailed implementation of structural adjustment and stabilisation programmes. A key element of this management strategy was budgetary austerity. While, initially, the austerity only affected the economic sectors it was later extended to cover social sectors including health care (Cornia *et al*, 1987). A key element of the budgetary austerity in the social sector was a shift away from the hitherto general tax revenue and donor-based financing of recurrent and development health care expenditures, respectively, to one based on

greater sectoral recovery of costs via user fees. Available literature on effects of these reforms in low-income countries is inconclusive as to what has happened to people's welfare. Some of the studies show that the reforms have had adverse effects on social service utilization and, hence, are welfare-reducing (Cornia *et al*, 1987; Gilson, 1988); other studies (Akin *et al*, 1987, Jimenez, 1987; World Bank, 1987) suggest that the reforms may have been welfare-improving. The existing uncertainty of the welfare effects of the reforms may be attributed to significant flaws in past studies. These include limited scope of spatial and service coverage in these studies, bad timing of evaluations, measurement errors, omission of relevant variables, e.g. price of food and sample selection biases (Deolalikar, 1996). This study attempts to redress some of these problems using facility-level demand data in Kenya for the period 1987-1996 with a further view of validating or revising policies based on the existing literature. On the basis of the study results, suggestions for facilitating the implementation of the desired reforms have been made.

1.2 Statement of the Research Problem

Two issues remain unclear about health care financing reforms in Kenya. The first is the welfare effects of increases in user charges. Previous work on this issue in Kenya (Mwabu and Mwangi, 1986; Kirigia *et al*, 1989) was done before cost sharing was introduced in public clinics, and reported favourable effects. *Ex-post* effects of the reforms, however, might be different. This study attempts to assess these effects using more comprehensive data sets and better specified models of health service utilization. The second issue about the financing reform that is still ill-understood concerns the effectiveness, costs, and the process of reform implementation. For example, how effective was the Government in implementing the cost-

sharing reform; what was the implementation cost; and how was the reform implementation process followed? The present study fills the knowledge gap in this important policy area.

1.3 Objectives of the Study

In view of the issues mentioned above, the objectives of the study were threefold: (a) documentation of health care financing reforms in Kenya (b) specification and estimation of a demand model for outpatient and inpatient services (c) analysis of welfare effects of fees using results from (b) above.

1.4 Macro-economic and Health Sector Situation

Kenya entered the 1970s with a strong economy, exemplifying the excellent macroeconomic performance of the 1960s. This was reflected in high growth of overall and sectoral gross domestic product (GDP), averaging at more than 5% per annum; balance of payments (BOP) surplus and minimal external debt burden; and price stability with the inflation rate averaging less than 4% per annum. The macro-economic performance record of the Kenyan economy during the 1960-1980 period was attributed to several factors including high savings and investment ratios, expansion of smallholder production of cash crops, and favourable external environment. With these factors and the resultant 'golden' macro-economic performance record, the country's health sector recorded tremendous growth especially in its public sub-sector. The sectoral growth was attributed to the high priority accorded to the improvement of the health status of Kenyans in the socio-economic development of the country.

The priority was reflected in the level and growth of resource commitments to the health sector. During these decades, the sector accounted for 5% of GDP, and, on average, about 5% of total central government expenditure and 6% of the government's total recurrent vote.

The high sectoral growth rate during these decades was reflected in the phenomenal growth in the number of health care facilities, programmes and personnel, and in the improvement of the health status of Kenyans.

By 1994 there were 3,754 health care facilities and 37,271 cots (or 147 cots per 100,000 population). The public health care provider, namely the Ministry of Health, runs about 1,834 facilities, unevenly spatially distributed across the country. The government health facilities are organised into a hierarchy of referral institutions comprising mobile clinics (4), dispensaries (1,158), health centres (35), sub health centres (13) and health clinics (51) at the base; sub-district, district and provincial hospitals (101) in the middle; and the Kenyatta National Hospital at the pinnacle, serving both as a national referral and a teaching hospital and offering a complexity of diagnostic facilities and skilled personnel (paediatricians, surgeons, obstetricians, pharmacists, and psychiatrists). Other health institutions operated by the Ministry of Health include Rural Health Training Centres (7), maternity homes (2), nursing homes (4), medical centres (8), and specialised institutions (1).

Table 1.1: Health Institutions, Hospital Beds and Cots, 1990 –1996

Type of Facility	1990 Number	1991 Number	1992 Number	1993 Number	1994 Number	1995 Number	1996 Number
Hospitals	268	277	301	308	324	346	387
Health Centres	299	357	477	569	562	531	548
Health Sub-Centres and Dispensaries	1,564	1,712	1,859	2,267	2,868	2925	3,058
Beds and Cots	33,086	33,926	34,360	38,131	37,271	47,214	49,371
No. of Beds and Cots per 100,000 population	136	148	145	156	147	180	175

Source: Republic of Kenya, *Statistical Abstract*, 1997

In 1994, the country's main private health care providers, namely, private for-profit and company institutions, missions and non-governmental organizations (NGOs) together accounted for about 39% of the total health care institutions (1,464); 54% of hospital institutions (178); 28% of health centres (536); and 36% of dispensaries (1,582). There were about 582 purely private health care institutions including private pharmacies, solo medical practitioners, traditional healers and midwives, and private laboratories. These accounted for about 3% of the total health care providers. The public and private health care facilities provide both curative

(out-patient and in-patient) as well as preventive and promotive health care services (including maternal and child health, family planning, sanitation, nutrition, and public health education on the promotion of good health and disease prevention). From the table it is evident that the total number of health institutions increased by 5% from 3,802 in 1995 to 3,993 in 1996. In the same period, the number of hospitals and health centres went up by 11.8% and 3.2% to reach 346 and 531 respectively resulting to a 4.5% rise in beds and cots. However the number of beds per 100,000 population dropped from 180 to 175 during the year under review.

Table 1.2: Breakdown of Health Institutions by Province (1996)

Province	Hospitals	Health Centres	Health Centres and Sub-Dispensaries	Total	No. of Beds and Cots	No. Per 100,000 Population
Nairobi	45	36	292	373	6373	330
Coast	42	47	352	441	3991	173
Eastern	50	69	652	771	6168	129
North Eastern	6	9	50	65	1451	215
Central	43	73	334	450	6606	175
Rift Valley	78	141	944	1163	9929	150
Nyanza	78	97	288	463	9480	194
Western	45	76	146	267	5334	161
Total 1996	**387**	**548**	**3058**	**3993**	**49331**	**175**
Total 1995	**346**	**531**	**2925**	**3802**	**47214**	**180**

Source: Republic of Kenya, *Economic Survey* 1997

There are about 79,000 health personnel in Kenya's public health sub-sector (see Table 1.3). Of these, 46% are administration and maintenance staff (AMS) whilst 39% comprise key health personnel (KHP) including medical doctors, clinical officers, dentists, nurses and midwives. The clinical support staff (CSS) and public and promotive health staff (PPH) each account for about 8% of the total health personnel. Overall, there are about 314 health personnel per 100,000 population. There are approximately 122 key health personnel, 27 clinical support staff, 22 public and promotive health and 143 administration and maintenance staff per 100,000 population. Among the key health personnel, dentists have the lowest coverage ratio of 2 per 100,000 population, while among the clinical support staff, the technology support staff also has a ratio of 2 per 100,000. Administration and maintenance has the highest coverage ratio of 143 per 100,000 population. The subordinate staff within this category of health personnel has the highest coverage ratio of 98 per 100,000 population.

Overall, there is need to restructure the public sector health delivery systems to facilitate an institutional framework with the necessary capacities to implement health sector reforms. The structure as shown above suffers from many operational bottlenecks which constrain the efficient delivery of services. While doing this, the functions and roles of the ministry of health will need to be clearly defined, again to facilitate clear schedule of duties and workplans for the health personnel. Lastly, the ministry need not assume responsibility as the sole provider of Health Services, it should instead play a more facilitative role that will enhance the participation of the private sector and of communities in the provision of health services.

Table 1.3: Health Personnel in Kenya, 1996

Category		Major Classification	Total	Percentage of Total	Per 100,000 Population
Key Health Personnel (KHP)	DOC	Medical Doctors	3,300	4	13
	CO	Clinical Officers	2,300	3	9
	DEN	Dentists	400	0.5	2
	NUR	Nurses/ Midwives	24,600	31	98
	KHP	KHP Sub-Total	30,600	39	122
Clinical Support Staff (CSS)	LAB	Medical Laboratory	2,800	4	11
	PHA	Pharmacy	1,900	2	8
	RAD	Radiology	700	1	3
	THE	Therapy	600	1	3
	TES	Technology Support	500	0.6	2
	CSS	CSS Sub-Total	6,700	8	27
Public and Promotive Health (PPH)	PHS	Public Health (PHO/PHT)	400	5	16
	PP	Preventive/ Promotive	1,300	2	16
	VED	Vector Borne Diseases Lab.	300	0.4	4
	PPH	PPH Sub-Total	5,600	7	22
Administration and Maintenance (AMS)	ADM	Administration	6,100	8	24
	MSP	Maintenance Support	5,300	7	21
	SUB	Subordinate staff	24,600	31	98
	AMS	AMS Sub-Total	36,000	46	143
TOTAL			78,900	100	314

Source: Development Solutions for Africa, Ltd.

Other types of health personnel not covered in Table 1.3 include community-based distributors (CBDs) of contraceptives (12,000-15,000); community health workers (CHWs) (8,000); and traditional birth attendants (TBAs), herbalists and other traditional healers. As Table 1.4 reveals,

distribution of Kenya's health personnel is concentrated in the urban areas. While only about 20% of Kenya's population live in the urban areas, more than half (56%) of its health personnel work in urban areas. Furthermore, 54% of key health personnel, 68% of clinical support staff and 61% of administration and maintenance staff are also concentrated in the urban areas. The preventive and promotive health staff are, however, concentrated in the rural areas with about 73% of the total personnel working there.

Table 1.4: Urban-Rural Distribution of Health Personnel in Kenya, 1996

Type of Personnel	Urban		Rural		Total	
	Number	Percent	Number	Percent	Number	Percent
Key Health Personnel (KHP)	16,600	54	13,900	46	30,500	100
Clinical Support Staff (CSS)	4,500	68	2,100	32	6,600	100
Public and Promotive Health Staff (PPH)	1,500	27	4,100	73	5,600	100
Administration and Maintenance Staff (AMS)	21,800	61	14,200	39	36,000	100
Total:	44,400	56	34,300	44	78,700	100

Source: Development Solutions for Africa, Ltd.

The uneven distribution of Kenya's health personnel reflects the uneven distribution of the country's health facilities and programmes. During the years 1990-1994, total medical personnel in the country averaged about 40,000. During this period the average number of doctors was over 3,500; dentists, over 600; pharmacists, over 500; pharmaceutical technologists, over 650; registered nurses, over 5,500; enrolled nurses, over 18,000; clinical officers, over 2,500; public health officers, over 600; and public health technicians, over 3,000. In terms of population coverage, medical personnel data translates to 15.75 doctors, 3.52 dentists, 2.95 pharmacists, 3.02 pharmaceutical technologists, 27.8 registered nurses, 72.71 enrolled nurses, 11.62 clinical officers, 3.65 public health officers, and 11.50 public health technicians per 100,000 population.

This population coverage ratio of the various categories of medical personnel seems low by the international standards.

Table 1.5: Trends in Medical Personnel, 1990 – 1994

TYPE OF PERSONNEL	1990 No.	1991 No.	1992 No.	1993 No.	1994 No.	No. per 100,000 population	In training	
							1993/94 No.	1994/95 No.
Doctors	3,357	1,457	3,554	3,794	3,895	15.75	1,318	1,388
Dentists	586	631	664	664	686	3.82	162	183
Pharmacists	443	472	542	605	628	2.95	252	275
Pharm. Technologists	604	644	680	720	745	3.02	148	160
Registered Nurses	5,441	10,700	5,879	6,210	6,286	27.80	1,165	1,186
Enrolled Nurses	17,734	18,674	19,604	20,933	20,988	72.71	4,292	4,300
Clinical Officers	2,630	2,675	2,786	2,913	2,988	11.62	745	780
Public Health Officers	585	620	686	732	747	3.65	88	92
Public Health Technicians	2,528	2,628	3,452	4,203	4,240	11.50	1,033	1,066

Source: GOK, *Statistical Abstract*, 1995, p. 240

Concomitant with the phenomenal growth in health care institutions, programmes and personnel during the country's first two decades of independence, was a significant improvement in the health status of Kenyans. Available data on trends in vital health status indicators, summarized in Tables 1.6 and 1.7, generally confirm this. However, the remarkable performance of the country's health sector could not be sustained into the subsequent decades of the country's independence, as is reflected in stagnation in both health care institutions and health status in the 1990s. This has been attributed to the prevailing harsh macroeconomic climate, inappropriate policy responses to this climate, and a host of

health care delivery system problems including inefficiencies, inequities, resource scarcities and new epidemiological pressures.

Table1.6: Trends in Kenya's Vital Health Status Indicators, 1965-1997

Health Indicator	1965	1980	1993	1997
Crude Death Rate	20 / 1000	12 / 1000	12 / 1000	12/1000
Crude Birth Rate	50 / 1000	49 / 1000	46 / 1000	46/1000
Immunisation coverage	•	74 / 100	76 / 100	80/100
Infant Mortality Rate	120 / 1000	74 / 1000	67 / 1000	66/1000
Life expectancy	40 years	60 years	60 years	55 years
Adult Literacy Rate	46 / 100	69 / 100	69 / 100	69/100
Doctors/Population Ratio	1 / 13,450	1 / 7,540	1 / 7,004	1/7092
Nurses/Population Ratio	1 / 1,860	1 / 990	1 / 983	1/755
Clinical Officers/ Population Ratio	1 / 12,944	1 / 10,889	1 / 9,834	1/9009
Health Facilities/ Population Ratio	•	1 / 12,580	1 / 12,580	14.2/10,000
Beds and Cots/ Population Ratio	•	1 / 153	1 / 153	1/176
GNP per capita	US$ 280	US$ 370	US$ 340	US$ 330

Source: Institute of Economic Affairs, Agenda '94: People, Economic Affairs and Politics. Nairobi, Institute of Economic Affairs. p. 257

Table 1.7: Demographic Indicators, 1963-1995

Indicator	1963	1979	1984	1989/90	1993	1995
Estimated population	8.9	15.3	18.4	21.4	24.5	27.5
Total Fertility Rate	6.8	7.9	7.7	6.7	5.4	5.0
Crude Death Rate/1000	20	14	13	12	12	12
Crude Birth rate/1000	50	52	50	49	46	43
Infant Mortality Rate/1000	120	104	87	74	67	67
Life Expectancy at Birth	44	54	56	58	60	58
Contraceptive Prevalence Rate	-	7	17	27	33	36
Population Growth Rate	3.0	3.8	3.3	3.3	3.4	3.0

Source: Central Bureau of Statistics, Office of the Vice-President and Ministry of Planning and National Development.

Kenya's post-Independence era has generally been characterised by demographic explosion. The country's total population, estimated at about 8.9 million people in 1963, is currently estimated at about 38 million. The rapid population growth that peaked at about 4% per annum was attributed to the high fertility rate and a substantial decline in the crude death rate and infant mortality rate. These were, in turn, attributed to the improvement in the health status of Kenyans. Since the early 1980s, however, there appears to be a slowing down in the growth of the country's population to about 3.0% per annum. This has been explained by a decline in the fertility rate from 7.9 in 1979 to about 5.0 in 1995. The decline in the fertility rate has, in turn, been explained by several factors including a gradual decrease in the crude birth rate, a rise in contraception prevalence rate for all methods (from 7% in 1978 to 33% in 1993), a rise in mean age at marriage, a rise in the proportion of educated women and women

who desire a small family, and severe economic pressure. The Kenyan population is generally youthful with at least half of the population being below the age of 15 years. Finally, the life expectancy of Kenyans at birth improved from 44 years in 1963 to about 58 years currently.

Preventable, vector-borne diseases continue to dominate the structure of morbidity and mortality nation-wide. Malaria and respiratory diseases account for more than 50% of reported outpatient morbidity. Other important causes of reported out-patient morbidity are diseases of the skin, including ulceration (8%); intestinal parasitic infections (4%); diarrhoeal diseases (4%), accidents, including fractures and burns (3%); and the HIV/AIDS pandemic, affecting an estimated population of about one million with a prevalence expected to rise from the current 7% to 10% by the year 2000, in the absence of effective intervention methods. A study conducted by the Ministry of Health with the support of the World Bank identified ten diseases accounting for about 77% of total mortality in the country. These were prenatal and maternal associated diseases; diarrhoea, malaria, pneumonia, AIDS, tuberculosis, protein/calorie malnutrition, cardiovascular diseases, measles, and injuries. Clearly, a reduction in the incidence of these diseases would significantly reduce mortality in Kenya.

Table 1.8: Major Causes of Reported Out-Patient Morbidity, 1990 - 1996

Disease Type	1990	1991	1992	1993	1994 %	1995	1996
Malaria	25.34	26.36	26.62	27.10	28.24	29.35	29.86
Diseases of Respiratory System	22.51	21.83	23.20	23.25	23.16	25.55	23.45
Diseases of the Skin (including ulceration)	8.53	7.16	9.14	8.73	7.87	7.92	7.92
Intestinal Worms	4.26	4.58	4.45	4.20	3.53	4.26	4.21
Diarrhoeal Diseases	4.17	4.08	4.36	4.14	4.53	4.31	4.48
Accidents (including fractures, burns, etc.)	3.04	2.42	2.70	2.91	2.71	2.85	2.97
Urinary Tract Infections	2.42	1.42	2.75	2.88	2.50	2.36	2.27
Eye Infections	2.38	2.88	2.47	2.32	2.19	2.50	2.24
Rheumatism, Joint pains, etc.	1.95	2.04	1.92	2.03	1.74	1.78	1.82
Ear Infections	1.64	1.72	1.54	1.58	1.40	1.48	1.5
Gonorrhoea	1.41	1.83	1.01	1.12	0.93	0.76	0.6
Pyrex of Unknown Origin (PUD)	1.11	0.71	0.49	0.55	0.54	0.40	0.5
Pneumonia	-	-	-	-	-	-	2.04
All other diseases	21.24	22.47	19.35	19.19	20.66	17.64	18.74
Total:	100.00	100.00	100.00	100.00	100.00	100.00	100.00

Source: Republic of Kenya, *Statistical Abstract*, 1995, pp. 242-246.

Rates of economic growth slowed in the early 1980s, as the world moved into recession. Oil prices rose, commodity prices fell, and the world-wide burden of debt soared. With

populations growing, rates of GNP per capita declined and for some countries, Kenya being no exception, the rate of economic growth drastically declined.

With severe shortages of foreign exchange to buy imports and competing claims on shrinking government budgets, health sectors, particularly in sub-Saharan Africa, faced tremendous resource cuts. With this situation little-changed in the 1990s, the question of finding alternative means to finance health care became an urgent and widely-debated topic, thus calling for health care financing reforms.

Good health is both a basic right and a prerequisite for rapid economic development. It is in view of that understanding that governments should invest heavily both in health care delivery and the expansion of health infrastructure. Indicators of health in Kenya are depicted from Tables 1.1, 1.2, 1.3, 1.4, and 1.5 are generally favourable, but the gap between the demand and supply of health services continues to widen. The sector has not been able to expand as rapidly as the population to ensure adequate coverage, accessibility and acceptable quality of health care for all. This situation has been worsened by inadequate finance for the health sector, the inefficient utilization of existing resources, the emergence of new diseases and by a rapidly growing demand for modern health care.

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1.5 Organisation of the Thesis

The thesis has seven chapters following this introduction. Chapter Two examines health care financing and reforms in Kenya and methods of financing health care, including health insurance. Chapter Three discusses the literature on health care pricing reforms in developing countries, highlighting the strengths and weaknesses of the studies reviewed. Chapter Four discusses the political economy of health care financing. The chapter begins with a discussion of various approaches to health care provision in low-income countries. It looks at events leading up to health reforms, and examines the role of power structure in the implementation of user charges for health care in Kenya.

In Chapter Five, a demand model for assessing the impact of cost sharing on the welfare of households is presented, and its main features discussed. Chapter Six gives an exposition of the methodology used to collect the data and explains the methods for their analysis. The chapter details data type and sources, and provides a brief description of study areas. Chapter Seven presents the empirical results. Chapter Eight gives a summary of the study and its key findings.

CHAPTER 2

HEALTH SECTOR REFORM

2.1 Health Sector Policies

In order to redress the sectoral problems, and to make quality care accessible and affordable by all Kenyans, the Government has instituted and implemented various health care reforms. These have been implemented with varying degrees of success, including harmonisation and decentralisation of the health care delivery system Gesami, (1990); integration of traditional medicine with modern medicine; expansion of health insurance coverage and benefits; and cost sharing in public clinics Mwabu, (1995).

Kenya's current health policy is stipulated in the Kenya Health Policy Framework (1994) and its subsequent implementation action plans and other derivative documents. The central issues addressed by the sectoral policy are governance (restructuring of the MoH); expanded provision of a basic package of quality health services to the growing population; human resource development; private sector, NGO and community involvement; and health sector financing. It should be noted that the health sector reforms form part of the wider reforms being undertaken by the Kenya Government. These are spelt out in the policy framework paper of February 1996, entitled Kenya's Economic Reforms for 1996-1998, which also sets up a Presidential Economic Commission to oversee the implementation of the proposed reform package to spur economic growth and reduce poverty. Other reforms complementing the sectoral reforms include the Civil Service Reform/Rationalisation Programme; Parastatal Reform Programme; District Focus for Rural Development, and reforms of key sectoral ministries.

The financing reforms stipulated by the sectoral policy document is fourfold, namely: resource mobilisation (through user fees and cost-sharing, health insurance and taxation); cost control and efficiency; planning and budgeting; and financial management. These financial reforms are geared towards creating an enabling environment that will ensure mobilisation of sufficient finances to support the entire health sector, and that effective and efficient use is made of these resources to provide the best quality care and services in a cost-effective manner.

2.2 Health Care Financing

Goodman and Waddington (1993) define health care financing as a general term that refers to the resources used to provide health care. While it most often refers to money, it also includes other resources that are used, such as voluntary labour or gifts in kind (items of equipment, supplies). The issue of health care financing relates to many aspects of health care provision. While its prime concerns are how much money is used, how it is raised, how it is spent and who controls it, the impact of these questions goes beyond mere matters of money. The issue of health care financing is, therefore, of much greater significance than might at first appear - in fact, it is a fundamental issue in health service delivery.

This section attempts to outline a variety of methods used in financing health care. There are three principal methods used: cost sharing (user charges), prepayment or insurance, and direct transfers and grants. The three methods can be applied at different levels of the health system (primary, secondary or tertiary), involve different health providers, and operate on different scales.

The term "user fee" relates to a charge made to the patient or user of the health service, for treatment or service received. The fee might be for consultation, drugs and dressings, and diagnostic tests. Fees are commonly charged for curative services since people are generally more willing to pay for a cure in the form of, say, drugs, than for promotive or preventive services. Prepayment (insurance) schemes operate to provide health care only for people who are members of the scheme. In order to join, it is necessary to make regular payment of a pre-determined sum, which means that people pay whether they are healthy or not. This payment entitles a person to receive health care for little or no extra charge when it is required. A major advantage of such form of health care financing is that the costs are shared between sick and healthy people. Direct transfers and grants refer to the provision of a quantity of resources, whether money or supplies, which does not have to be repaid. The quantity of the transfer or grant will usually have to be re-negotiated in advance and it might be a regular payment or a one-off gift. The choice of financing methods will depend upon what it is hoped to be achieved with the health programme.

2.3 Patterns of Health Care Expenditures

The Government remains the major financier of health care, meeting nearly half of the national health recurrent expenditure. The private market (insurance and out-of-pocket modes) meets 42%, while the missions, companies, donors and NGOs meet 6% (WHO 1995 pg. 215) of the expenditure. In creating and supporting the expanded health infrastructure the Government relied heavily on tax revenues, leading to a rapid growth in the nominal health budget from K£12.77 million in 1972 to K£691 million in 1996, out of which the recurrent component accounts for about 80% (GOK, (1996)). The increases in nominal funding notwithstanding, MoH's total and recurrent spending, as a percentage of treasury budget allocations, has been on

the decline from the early 1980s, coinciding with the implementation of structural adjustment programmes. Similarly, MoH's spending per capita, that rose in the 1970s, declined after 1980.

The secular decline in health expenditure has affected the ability of Kenya's public health sector to provide health care services, and the situation is likely to worsen with hard economic times ahead unless appropriate measures are adopted. The share of government recurrent expenditure allocated to health is projected to be 9.6% in 1996/97 compared to 9.26% in 1979/80. However, expenditures were at their lowest in 1988/89 (7.35%) before rising steadily to about 8% in 1994/95. Per capita expenditures have steadily declined from a high rate of US$9.82 in 1980/81 to US$ 6.2 in 1995/96, which is a 36% drop in US$ terms. This situation will be aggravated with the HIV/AIDS pandemic. Moreover, 70% of the recurrent health budget is tied to staff emoluments, leaving only 30% for supplies (Development Plan, 1997-2000).

In terms of resource allocation, there are two central issues: the distribution of resources between curative and preventive health care; and the allocation of expenditure between urban and rural areas. With respect to distribution, curative care accounted for a projected 67% of total recurrent expenditure for 1996/97 while rural and preventive health care accounted for 21%. This expenditure mix discriminates against rural and poor populations. With respect to the allocations of expenditure, the Kenyatta National Hospital accounted for 16.3% of total recurrent expenditure, while all rural health centres, the first constant for rural populations, accounted for 21%. Hence, health expenditures tend to favour the urban areas.

The National Hospital Insurance Fund (NHIF), established in 1968, provides another financing mechanism to Kenya's health sector. The scheme provides cover for the contributors (mostly salaried people) and their families, for in-patient care in approved

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hospitals. The fund provides about 50% of the cost-sharing revenue and has, until recently, provided a major source of income for many hospitals. In reality, it provides only 4% of the total gross recurrent expenditure (MoH 1995/98) and has a limited coverage of 25% of the population (Quick and Armsay, 1993). So far, the Fund remains non-accountable to its members and even less responsive to the needs of its members. The claiming process is tedious, has high transaction costs and is characterised by fraud and abuse. Worse, the hope of generating more resources through the institution remains limited and uncertain due to the weak administrative systems, poor investment portfolio and low claims settlement that characterise both the user charges and the NHIF. The principles, rationale and modalities of the cost-sharing policy could be a matter of great concern if the policy will remain central in Kenya's health care financing.

The performance of the NHIF has been improving. The total number of contributors to the Fund rose by 12.5% from 1.6 million in 1994/95 to 1.8 million in 1995/96. Similarly receipts from contributors rose by 17.0% from K£61.44 million in 1994/95 to K£71.9 million in 1995/96. However, benefits paid out by the Fund dropped significantly in comparison to the previous year simply because 61 hospitals were involved in a fraud with the Fund and as a result they were de-gazetted by the Government. The net effect of this suspension was that benefits fell drastically from K£52.4 million in 1994/95 to K£17.1 million in 1995/96.

The emphasis accorded to the health sector by the Government in the 1970s and 1980s resulted in increased public expenditure. For example, nominal spending increased from US$37 million in 1972 to US$234 million in 1996. As a percentage of total public expenditure, it averaged about 7% between the 1970s and early 1980s. It dropped however, to an average of 6% by the late 1980s and by the 1990s it was about 4%. During the same period, the MoH recurrent

expenditure remained constant at about 5% of total public expenditure between 1970s and the 1980s. However, beginning with the 1990s, the proportion dropped to about 3% of total public expenditure.

The decline in recurrent expenditure has resulted in an imbalance between personnel costs and other operating expenses. The outcome has been mass deterioration in the efficiency of health personnel and the quality and coverage of public health care. This has been manifested in recurrent shortfalls in drug availability, and in maintenance of equipment, buildings and vehicles.

In a number of successive policy documents, especially in the five-year national development plans, the Government has repeatedly stated its commitment to provide health facilities, as a basic need, to all Kenyans. In support of this policy objective, budgetary allocations to the health sector have increased in absolute terms, such that the MoH's recurrent budget rose to Kenya pounds 357.0 million in 1996/97. However, per capita allocation declined in real terms from US$ 8.65 (1979/80) to US$3.09 (1996/97). An increase of 7.16% in absolute terms does not, therefore, reflect this national commitment; this funding effort remains inadequate in the face of increased demands on the health system.

The best indicator of the sustainability of Government spending within the health sector is expenditure under the recurrent budget. This is important given the understanding that 97% of the resources under this budget are derived from the exchequer. The remaining 3% come from internally-generated funds - Appropriations in Aid - raised from sale of assets and miscellaneous receipts. These funds are, however, quite distinct from cost-sharing revenue which is never included in Treasury budgets. Between 1986/1987 and 1996/1997, actual recurrent spending per

capita in nominal terms (ignoring inflation) rose from Kenya Pounds 4.64 to 13.65. This amounts to an average increase of about 18.3% per annum. Tables 2.1 and 2.2 show how recurrent funds in the MoH have been shared among different functions of the Ministry between 1994/1995 and 1996/1997.

The share of recurrent resources going to the district level has consistently increased from 50.3% (K£144 million) in 1994/95 to 53.8% (K£259 million) in 1997/98. The greatest influence leading to this has been the increase in resources devoted to rural health centres and dispensaries, from 9.7% (K£28 million) to 12.7% (K£61 million). The other contributory factor has been a marginal increase in the share for district hospitals. However, the latter has tended to fluctuate ranging from 37.4% (K£107 million) to 38.2% (K£182 million). This is consistent with the policy objective of devoting more resources to primary level facilities. Nevertheless, it is important to understand that the district hospitals are heavily under-funded.

The data about the NHIF is somehow confusing due to big discrepancies between budget allocation and actual expenditure. The share attributed to NHIF declined from 0.9% (Kshs 2.5 Million) in 1994/95 to 0.1% (Kshs 202,000) in 1996/97 and then the approved estimates 1997/98 reported an allocation of more than Kshs. 16 million, that is 3.4% of the recurrent expenditure as indicated in Tables 2.1 and 2.2.

Table 2.1: Functional Composition of Recurrent Health Expenditure

Currents Kshs. National level	1994/95 Actuals	1995/96 Actuals	1996/97 Actuals	1997/98* Budget
Central Administration & Planning (HQ)	13,280,231	12,871,560	16,903,234	15,597,454
Central Medical Store	1,644,300	1,783,435	1,795,002	2,835,941
National Hospital (KNH)	48,795,707	62,554,855	60,396,998	70,396,810
Specialised Hospitals	6,190,757	6,781,126	7,459,792	11,009,456
National Hospital Insurance Fund	2,558,955	551,041	202,782	16,275,425
Health Training Colleges (KMTC) – Central*	3,820,605	4,514,902	5,136,484	6,014,656
Engineering & Production Units	828,117	996,276	1,016,287	694,742
Grants to NGOs	460,098	1,256,606	278,915	148,950
Subtotal	77,578,770	91,309,801	93,189,494	122,973,434
Provincial Level				
Provincial Administration & Planning	3,951,147	4,686,490	5,492,363	2,927,085
Provincial Hospitals	38,328,179	47,577,765	54,596,617	75,264,138
Health Training Colleges (KMTC) – Province*	4,056,977	4,837,395	5,503,376	6,444,274
Port Health Control	1,122,354	1,265,309	1,393,557	2,156,219
Subtotal	47,458,657	58,366,959	66,985,913	86,791,716
District Level				
District Hospitals	107,037,601	137,801,450	146,493,595	182,507,843
Rural Health Centres and Dispensaries	27,876,801	36,058,563	40,479,389	61,337,621
District In-Service Training Services	172,263	0	132,480	106,820
Rural Health Training and Demon. Centres	3,307,644	3,886,876	3,736,182	6,486,492
Health Training Colleges (KMTC) – District	5,618,846	6,772,353	7,704,727	9,021,983
Subtotal	144,013,155	184,519,242	198,546,373	259,460,759
Vertical Programmes				
National Aids Control Programme	238,208	697,596	565,559	576,920
Sexually Transmitted Infections Programme	0	0	0	451,270
National Quality Control Laboratories	137,102	172,061	141,027	201,845
Environmental Health	10,211,911	13,714,317	14,125,975	522,796
Communicable & Vector Control Diseases	1,630,162	7,184,572	7,661,939	3,404,580
Nutrition	280,588	203,721	161,966	330,474
FP & MCH	1,821,088	1,803,222	2,096,479	1,481,683
Health Education	276,811	297,520	317,530	556,213
National Public Health Laboratories Services	2,567,557	2,844,463	2,540,611	3,544,269
Subtotal	17,163,427	26,917,472	27,611,086	2,125,409
Total	286,214,009	361,113,473	386,332,866	13,195,459

Source: Republic of Kenya: The Appropriate Accounts other Public Accounts for 1990-91; 1991-92; 1992-93; 1993-94; 1994-95; 1995-96; and MoH Account Division for 1996-97

Table 2.2: Functional Composition of Recurrent Health Expenditure (current Kshs)

National Level	1994/95 Actuals	1995/96 Actuals	1996/97 Actuals	1997/98 Budget
Central Administration & Planning (HQ)	4.6	3.6	4.4	3.2
Central Medical Store	0.6	0.5	0.5	0.6
National Hospital (KNH)	17.0	17.3	15.6	14.6
Specialised Hospitals	2.2	1.9	1.9	2.3
National Hospital Insurance Fund	0.9	0.2	0.1	3.4
Health Training Colleges (KMTC) – Central	1.3	1.3	1.3	1.2
Engineering & Production Units	0.3	0.3	0.3	0.1
Grants to NGOs	0.2	0.3	0.1	0.0
Subtotal	27.1	25.3	24.1	25.5
Provincial Level				
Provincial Administration & Planning	1.4	1.3	1.4	0.6
Provincial Hospitals	13.4	13.2	14.1	15.6
Health Training Colleges (KMTC) – Province*	1.4	1.3	1.4	1.3
Port Health Control	0.4	0.4	0.4	0.4
Subtotal	16.6	16.2	17.3	18.0
District Level				
District Hospitals	37.4	38.2	37.9	37.8
Rural Health Centres and Dispensaries	9.7	10.0	10.5	12.7
District In-Service Training Services	0.1	0.0	0.0	0.0
Rural Health Training and Demon. Centres	1.2	1.1	1.0	1.3
Health Training Colleges (KMTC) – District	2.0	1.9	2.0	1.9
Subtotal	50.3	51.1	51.4	53.8
Vertical Programmes				
National Aids Control Programme	0.1	0.2	0.1	0.1
National Quality Control Laboratories	0.0	0.0	0.0	0.0
Environmental Health	3.6	3.8	3.7	0.1
Communicable & Vector Control Diseases	0.6	2.0	2.0	0.7
Nutrition	0.1	0.1	0.0	0.1
FP & MCH	0.6	0.5	0.5	0.3
Health Education	0.1	0.1	0.1	0.1
National Public Health Laboratories Services	0.9	0.8	0.7	0.7
Subtotal	6.0	7.5	7.1	2.7
Total	100	100	100	100

Source: Republic of Kenya: The Appropriate Accounts other Public Accounts for 1990-91; 1991-92; 1992-93; 1993-94; 1994-95; 1995-96; and MoH Account Division for 1996-97

2.4 Cost Sharing and User Charges

Since the initial period of independence, the Government operated a system of "free" medical services alongside subsidised church and private services. In reality, however, not all services were entirely free. Visits to government health centres and dispensaries, and to hospital outpatient departments, were free of any user charges. In-patient services were free to patients aged 16 years and below, but adult in-patients paid a fee of Kshs. 60 (US$ 1.00) at the time of discharge irrespective of duration of stay. Other assorted charges existed, such as Kshs. 180 (US$ 3.00) for amenity, some X-rays (especially for medical examinations) and for prosthetic devices. Additionally, government hospitals ran amenity wards with a few beds for which Kshs. 90 (US$ 1.50) was charged per day. For Kenyatta National Hospital, the charges were Kshs. 120 (US$ 2.00) per day.

The collection of fees was poorly enforced, however, because this would have been a contradiction of the Government's stated objective, upon attaining independence, of providing free medical services. However, as constraints on social spending became more evident, the Government became increasingly interested in implementing its cost-sharing policies. The most forceful policy statements regarding charging of user fees as a means of cost recovery were contained in both the Ndegwa Committee Report (1982) and the Ministry of Health Development Plan (1984-88: pp. 19-20).

With increased expenditures in Kenya's health spending, which pointed to the Government's fiscal constraints, the sustainability of the ambitious free medical services policy was threatened from the early 1980s. A cost-sharing programme in the health sector was therefore mooted to supplement government funding in the 1984/88 Development Plan and implemented in December 1989. In spite of the resistance, flaws and problems at the implementation stage

(Mbugua 1993), the policy appears to be central to Kenya's public health care financing. The programme generates additional revenues through user charges and collections from the NHIF and other third parties. With its contribution gradually rising from KShs. 28.5 million in 1990/91 to KShs. 62.5 million in 1992/93, and KShs. 205.1 million in 1996/97, the implication is that the programme contributes greatly towards the health care financing. The full potential of the cost-sharing programme in Kenya including the NHIF is yet to be fully exploited. Unfortunately, the programme cannot be relied entirely to bridge the financing gap estimated at 50%.

The National Development Plan 1984-88 adopted the proposals by the Ministry of Health and labelled the provisions as alternative financing mechanisms (pp. 153-154). The Plan argued for cost sharing as a response to the rising cost of providing good quality medical care and the difficulties faced by the Government in paying the costs from general revenues. It proposed the establishment and improvement of amenity wards and selective charges for hospital outpatient and inpatient services. Both the Ndegwa Committee Report and the Development Plan argued for increased consumer cost sharing for medical services, were merely suggesting implementation of a principle that had existed since Independence. These policy statements were echoed in Sessional Paper No. 1 of 1986 on Economic Management for Renewed Growth (Republic of Kenya, 1986) and the Ministry of Health concept paper of 1989 on Cost Sharing. This series of policy statements, begun in 1982, finally resulted in the decision to implement fees through the Government of Kenya Cabinet Paper of August 1989, recommending that the Ministry introduce user fees in all its facilities, except at the lowest (dispensary) level. Fees were introduced on December 1, 1989.

The decision to implement cost sharing in the health sector was a logical reaction to pressures from many corners. The decision process was long and deliberate. However, it is clear from the

policy statements that the main objective of cost sharing was to generate additional resources, although the various Committees were well aware of other dimensions to the initiative. In implementing the policy reform, the Ministry of Health realized that a number of other important objectives were crucial to its success. The Ministry's concept paper listed a number of objectives of the policy reform, which are summarized below.

The primary aim of the reform was to generate additional revenue. The paper emphasised that the primary goal of the reform was not to disengage the Government from the health sector but to raise additional revenues for health service delivery and to allow the Government to reallocate its spending in the service of improving the efficiency and equity of tax-financed services. User fees were also to be a tool to target public subsidies for curative services more carefully to patients who needed them most. Those who could contribute should contribute, but those who could not, should not be denied access to public medical services. Ensuring continued access by the poor was also considered important to the political acceptability of implementing cost sharing. Another stated aim of the reform was to improve the quality of services. Given that one of the demands prompting the cost-sharing initiative was a perceived need for higher quality services, some portion of the revenues from cost sharing was to be returned to the originating facility.

It took a number of empirical studies (Kirigia *et al*, 1989; REACH 1988a, 1988b), and considerable pressure from donors for the Government to implement the reform in government clinics in December 1989. Due to the uncertainty of the welfare effects of user charges, the Government initially introduced these cautiously and in only a quarter of the public health facilities, with exemptions of certain types of services (MCH/FP, chronic illnesses such as TB)

and of socio-economic groups (children under 10 years, the poor and civil servants) from payment of the user fees.

The fees for chargeable services and persons differed by type of facility, in order to help deflect demand from more costly, higher-level facilities such as hospitals, by providing a financial incentive for patients to first attend cheaper, lower-level dispensaries and health centres. An out-patient charge of KShs. 40 (US$ 0.66) was levied per patient per visit at the Kenyatta National Hospital (KNH), KShs. 20 (US$ 0.33) per patient for a maximum of thirty days at provincial or district hospitals, Kshs. 10.00 (US$ 0.17) per patient a month at a health centre, and no charge at a dispensary.

The following structure of in-patient charges also varied by type of health care facility: Kshs.60 (US$1.00) per day in a government hospital and Kshs.30 (US$0.50) per day in a health Centre for a maximum of five days per admission.Kshs.150 (US$2.50) and Kshs.300 (US$5.00) for maternity for each day spent at a general hospital and health centre, respectively. Kshs.600 (US$10.00) per day in KNH for delivery, Kshs.60 (US$1.00) per day in a general ward, and Kshs.1,200 (US$20.00) per day in an amenity ward. Charges for amenity wards in other hospitals were Kshs.900 (US$15.00) and Kshs.60 (US$1.00) for single room and shared room, respectively.

Other charges included Kshs.30 (US$0.50) for each tooth extracted; Kshs.60 (US$1.00) for filling a tooth; Kshs.75 (US$1.25) for each routine X-ray taken; Kshs.300 (US$ 5.00) for each special X-ray taken, irrespective of whether it was for in-patient or out-patient treatment; shs.30 (US$0.50) for each routine laboratory test and Kshs.60 (US$1.00) for each special laboratory test done; Kshs.300 (US$5.00) for each medical examination; and Kshs.150 (US$2.50) for each

circumcision performed (Republic of Kenya, 1989). The fee revenue was to be spent to improve health services in institutions and districts. Seventy-five percent (75%) of the fee revenue was to be retained in the facility of collection to improve services there. The remaining twenty-five percent (25%) of the fee revenue was to be forwarded to the District Accountant to finance preventive and primary health care services in the district where the revenue-generating institutions were located (Republic of Kenya, 1989).

In August 1990, nine months later, the above health care pricing reform was abruptly reversed, implying suspension of all fees for outpatient and in-patient health care services. The reversal of the reform was based on strong suspicions that it had negative welfare effects on the poor, as well as its failure to bring about the anticipated improvements in the quality of services provided by the facilities. It was also claimed that the reform had significantly reduced access by the poor to health care services, and that complaints about shortages of drugs and stationery in government health facilities continued even after implementation of the reform.

At the time of its suspension, the reform had generated Kshs.7 million, amounting to no more than 3% of the recurrent budget of the MoH. By then, only a few facilities had used retained revenue to improve the quality of their services through the purchase of drugs and the repair of their infrastructure.

During the period the suspension was in effect, the Government's fiscal situation continued to deteriorate, leading to its inability to compensate the facilities for the fee revenue they had lost (Dahlgren, 1990). Consequently, in April 1992 the Government announced a phased reinstatement of a slightly modified health services pricing reform. The implementation of user charges at various levels of the health care system was as follows: national referral hospital,

national referral hospital, April 1992; provincial hospitals, July 1992; district hospitals, January 1993; and health centres, July 1993.

The reinstated health care pricing reform differed from that suspended in several respects that increased its public acceptability and led to some improvement in the quality of services. First, unlike the suspended reform, the new reform was preceded by public information campaigns. Second, the reinstatement of the reform was accompanied by several managerial reforms. The first managerial reform was the creation of a central unit within the MoH to implement the new user fees. Its tasks included setting fees, initiating changes in national insurance regulations, and training health personnel in the new system of financial management (i.e. in collection, recording and banking of fee revenues). The other financial innovations of the new reform related to timing of payment of charges, authorisation of expenditure of retained funds, and groups of population exempted from charges. Unlike the suspended reform, the new reform provided for payment of charges after treatment, decentralised management of 75% of the fee revenue retained in facilities by District Health Management Boards (DHMBs) with representation of the community, and expansion of the groups of population exempt from the fees including civil servants, the military and the unemployed.

The latter two managerial innovations of the new reform are the subject of controversy. First, the decentralised management of 75% of the fee-revenue, while well-intended, may exacerbate existing disparities in the spatial distribution of public health facilities and quality of services. Second, the expansion of the socio-economic groups exempt from paying fees would reduce the revenue yield of the reform, while the subjective adjudication of the beneficiaries (especially the poor) of the exemptions and waivers, being vested in the facility managers, implies possible regressivity of the reform. Cost sharing cannot be implemented in isolation from other health

financing reforms - placing the burden of financing on the individual without exploring social insurance, resource allocation or general efficiency would be improper and could cause failure of a cost-sharing programme.

The existing cost-sharing mechanism has been found to cause hardship and to restrict access to modern health care by the vulnerable, and to endanger primary and preventive health care activities. However, the system should be maintained in some form since the Government is unable to fully finance or deliver highly subsidised health services to all citizens. More innovative approaches therefore need to be put in place to overcome the implementation weaknesses. Strategies should be adopted to improve efficiency in revenue collection, to balance the revenue generation and access objectives, to assure quality services, and to direct government financial support or cross-subsidies to poorer facilities. Disincentives against loss, mismanagement and diversion of health care funds to other uses should be put in place and strictly enforced.

2.5 Insurance

Two sets of social insurance reforms proposed in the country's health policy document are progressively being implemented. First, there has been expansion of mandatory health insurance benefits to cover outpatient medical care costs. Along with this, the Ministry of Health has not only encouraged competition among accredited social insurance schemes but has shifted its financial burden of curative care to private insurance schemes. Second, the health insurance sector is being reformed through the development of innovative financing mechanisms that guarantee accessibility to basic packages of health services to all, based on need and not on ability to pay. The National Hospital Insurance Fund is being transformed into an effective pay-as-you-go health insurance fund with mandatory coverage of all formal sector workers.

The National Insurance Fund Act will be reviewed to establish a comprehensive health insurance scheme. This will be a major avenue for increasing the flow of funds from the private sector towards the financing of health care. The development of such a scheme might be seen as an important precursor to the country's national health service, which provides for all.

The secular decline in health expenditure has affected the ability of Kenya's public health sector to provide health services, and the situation is likely to worsen in the face of serious economic challenges facing the economy. The share of government recurrent expenditure allocated to health is projected to be 9.6% in 1996/97, compared to 9.26% in 1979/80. However, expenditures were at their lowest in 1988/89 (7.35%) before rising steadily to about 8% in 1994/95. Per capita expenditures have steadily declined from a high of US$ 9.82 in 1980/81 to US$ 6.2 in 1995/96, which is a 36% drop in US$ terms.

In a number of successive policy documents, especially in the five-year national development plans, the Government has repeatedly stated its commitment to provide health services as a basic need to all Kenyans. In support of this policy objective, budgetary allocations to the health sector have increased in absolute terms, such that the MoH's recurrent budget rose to Kenya Pounds 357.0 million in 1996/97. Even though the per capita allocation declined in real terms from US$ 8.65 (1979/80) to US$ 3.09 (1996/97), an increase of 7.16% in absolute terms does reflect this national commitment. However, this funding effort remains inadequate in the face of increased demands on the health system.

The Kenya Government, through the Ministry of Health, currently provides 72% of the combined recurrent and development budget of the Ministry of Health. With regard to current expenditure alone, the Ministry provides 42% while the National Hospital Insurance Fund provides only 3.79%. The Kenya policy framework seeks to reverse these proportions such that user contributions through insurance premiums can increasingly pay for the services currently being paid for by the MoH. For effective realisation of the above, it requires the conversion of the National Hospital Insurance Fund into a Health Insurance Scheme Act. A restructured fund also implies a reconstitution of the Board to bring on stream professional capability, considering that the role of the Scheme would be different from that of the existing Fund.

The development of Kenya's Health Policy Framework paper of 1994 accomplished a major milestone towards reforming the health sector. The blueprint presents a succinct and factual analysis of the health situation in Kenya, and also proposed broad strategies and policy objectives to address problems in the health sector. The Kenya Health Policy Framework (1994) recommends reform in the health insurance sector through the development of innovative financing mechanisms that guarantee accessibility of basic packages of health services to all,

based on need and not on ability to pay. In particular, legislation will be enacted to transform the National Hospital Insurance Fund (NHIF) into an effective, pay-as-you-go health insurance fund with mandatory coverage for all formal sector workers.

In reforming the financing of health care services, there is a policy desire to promote the increased participation of other stakeholders. There is a deliberate move in this direction. The implementing and expansion of the cost-sharing initiative is likely to form a part of the strategy in realising this objective. It is envisaged that user fees will be raised and their collection enhanced at facility level. The health facilities should, in turn, provide quality services in order to justify the upward adjustment in fees and user charges.

Efforts that seek to increase the flow of resources to health financing must not overlook the important contribution that communities can make towards the realisation of this objective. Innovative schemes that entail the provision of health care services that are relevant to communities have been known to trigger enthusiastic community response, participation and contribution. Community-managed health schemes will, therefore, form an integral part of the strategy for increased resource flow into the health sector.

The above calls for the creation of an enabling environment that will facilitate the increased participation of the private sector, non-governmental agencies and communities in the expansion of health care services. This definitely calls for a review of the existing legal arrangements to streamline procedures in the licensing of NGOs and private agencies involved in the provision of health services. There is a need also to explore alternative incentives that may be offered to these agencies to take health care services to under-served areas. The resources of the MoH need to be concentrated on a core of central and critical investments.

It is equally important to observe that primary health care activities within the health care sector are not accorded the required weight in terms of resource allocation, and yet the primary health care approach is perhaps the only one that readily translates itself into a community-oriented programme and one which offers tangible results. It is imperative that the shift in emphasis towards preventive/promotive health services be accompanied by an equal commitment to expand and intensify primary health care activities. In some districts, the community-based approach to health care activities already has taken root using the Bamako type of initiative.

CHAPTER 3

LITERATURE REVIEW

The existing analytical and empirical frameworks for analysing the welfare effects of health care pricing reforms in developing countries are the conditional and unconditional health care demand models (see Dow, 1995). Here we present a survey of literature on such models to inform the methodology for analysing the welfare effects of the cost-sharing policy in Kenya's health care sector. The survey is organised in two sections: theoretical literature and empirical literature.

3.1 Theoretical Literature

The cost-sharing policies affect individual utilization of health services because price is one of the determinants of health service utilization. There are two approaches in the literature to the study of health care utilization by the population: conditional health care demand analysis and unconditional demand analysis. In the conditional approach, which predominates the literature, health care demand behaviour is conditional upon illness. Specifically, since curative health care is demanded by the sick, the healthy are assumed not to demand medical care. This modelling approach, by ignoring endogeneity of health status, has potential for sample selection bias because the behaviour of the non-sick is not taken into account when estimating demand effects of prices and of demographic covariates. The first analytical effort at integrating the healthy in health care demand modelling was by Dow (1995). Dow develops a simple dynamic model to formalise the dual effect of user fees on the demand behaviour of sick and of healthy individuals. He distinguishes between short-run and long-run price effects and shows that the conditional demand specification allows only

political because it affects the distribution and allocation of resources, as well as the benefits and harms (Reich, 1993). In turn, it promotes competition among groups seeking to influence the distributional consequences – effectively based on competition for resources or power (Long and Long, 1992; Grindle and Thomas, 1991; Walt and Gilson, 1994). Indeed, the class dynamics embedded in a change process imply that the poor, due to subordinate position and lack of voice across different social relations (e.g. in land, credit, labour, political representation and ability to make leaders account) remain vulnerable. Their vulnerability makes it obvious that the provision of health care to the poor or allocation of resources in their favour is likely to be of low priority in the agenda formed by dominant classes, or for the political decision-makers and implementers who represent and are bound by the interests of the dominant class (Doyal and Pennell, 1979; Turshen, 1989).

3.2 Empirical Literature

The empirical literature on the determinants of demand for curative health care in Africa can be traced to the 1980s following the introduction of such structural adjustment measures as user fees in the financing of health care. The literature offers inconclusive evidence regarding the price elasticity of demand for curative health care service. Evidence from the early stream of empirical literature, generally reported a low and statistically insignificant price elasticity of demand for curative health care, implying marginality or neutrality of pricing reform in health care services utilization (Akin *et al*, 1986a,b; Kirigia *et al,* 1989; World Bank, 1997; REACH, 1981, 1988; Birdsall and Chuhan, 1986; and Schwartz *et al. 1991).* The evidence seems to have rationalised the introduction of user charges to finance health care in many developing countries, especially in Africa. Evidence from the recent stream of literature reports high and statistically significant price elasticity of demand for curative health care especially at the lower end of income distribution, implying a significant negative effect of

user fees on health service utilisation by the poor. For a discussion of the issues involved see Mwabu and Wang'ombe (1994, 1997); Mwabu *et al* (1993); Moses *et al* (1992); Huber (1993); Kraushaar and Akumu (1993); Quick *et al* (1993); Gertler *et al* (1987); Alderman and Gertler (1988); Gertler and van der Gaag (1990); Deolalikar (1996); Bekele and Lewis (1986); McPake *et al* (1993). The findings from these studies, that fees significantly reduce health care utilization among low income households, have been further corroborated by such Kenya-specific studies as those by Moses *et al* (1992), Collins and Hussein (1993), Quick *et al* (1995), Mwabu and Wang'ombe (1998) and Collins *et al* (1996). Similar empirical effects of user charges have been reported in several other countries including Egypt (Ellis *et al*, 1994), Ghana (Waddington and Anyimayew, 1990); Swaziland (Yoder, 1989) and Zambia (Foresberg *et al*, 1992). The result of this latter stream of studies, that fees reduce demand, has been rationalised on several grounds including low levels of existing user fees (on which additional fees are levied), and availability of alternative sources of medical care. The findings of these studies cautioned that a large drop in service utilization by the poor could result following implementation of even modest user fees in government health facilities. Despite the cautionary implications of the findings against user fees, fees were implemented in many developing countries, mainly on the grounds that they would improve efficiency and sometimes equity (Sauerborn *et al*, 1994).

Results of studies from Cameroon (Livtack and Bordat, 1993) and Niger (Diop *et al*, 1995; Wouters, 1995) show opposite effects of fees. Here, implementation of user charges improved service quality, averting reductions in medical care use. The findings of the first stream of literature have been considered paradoxical considering the very low income and medical insurance coverage levels in developing countries (Deolalikar, 1996). The differences in the results highlighted above might be due to measurement errors (e.g., expenditure per medical visit reported by consumers may differ from the standard fee

schedules published by providers). It is, thus, possible that the price used in the estimation of elasticities might be subject to large measurement errors, which are made worse by differences in quality of service at different facilities. Specifically, the measured effects of unit prices on health care are a combination of disease-specific or technological effect and the consumer-chosen quality effect. The elasticities might also suffer from measurement errors even when published or official fees to estimate demand functions (see e.g. Gertler and van der Gaag, 1990) due to failure to incorporate related costs such as travel, waiting and quality costs, thereby overstating price elasticity estimates (Deolalikar and Vashista, 1992). Another bias in reported elasticities might come from endogeneity of some of the right-hand variables. Ellis and Mwabu (1991) discuss endogeneity of health status by showing that demographic characteristics not only affect demand for health care once a person is sick, but also affect the probability of a person reporting sickness and so are correlated with the error term.

Another issue requiring attention in the literature is the omission of food prices from medical care demand specification, given that the health and nutritional status of an individual are jointly determined (Behrman and Deolalikar, 1988). A further problem with previous literature is that some of the studies were undertaken barely a year after the implementation of the cost-sharing reforms, before the full effects of the reforms could be felt (see, e.g., Collins *et al*, 1996; Mwabu and Wang'ombe, 1997).

The literature on efficiency, equity and revenue mobilisation effects of cost sharing reports favourable effects of fees (Kirigia *et al*, 1987; REACH, 1988; Makinen, 1988; Huber, 1989; Kamau, 1991; Ellis, 1987). However, time lags required for these positive effects were much longer than initially implied (Litvack and Bodart, 1993). The long lags are due to administrative and regulatory constraints in using revenue raised from user fees to provide better services. Lack of effective service management at health facilities was an even greater

obstacle to improving quality of health care services at public health facilities. In Kenya, two management innovations were introduced during the second phase of user charges to overcome this problem, namely, the creation of a central unit within the Ministry of Health charged with the actual implementation of user fees, and the establishment of District Health Management Boards to decentralise authorisation of expenditure of the revenue retained at the health facilities and to create representation of the community in the management of public health services. Although critical in getting the public to accept the new fees, these Boards only led to marginal improvement in the quality of health care services (Collins *et al*, 1996), because of the diversion of funds to cover recurrent expenditure shortfalls arising from low Treasury allocations.

The most well known and widely discussed econometric estimates of health care demand for a developing country were reported in the mid 1980s for the Philippines which were quickly followed by a number of similar studies (see Akin *et al* 1985, 1986, Dow *et al,* 1987, Ellis, 1987, Gertler *et al,* 1987 and Shwartz *et al*, 1987). The Philippines study showed that the elasticity of medical care with respect to user charges was substantially less than unity; that is, other things being equal, a small increase in user charges would reduce medical care demand by very little. This result was derived with greater care from a detailed household data set. Consequently, price inelastic health care demand was used in support of the policy of charging for health services in developing countries (see Akin, Birdsall and de Feranti, 1987, Griffin, 1988). Further, work on health care demand by the Philippines study showed that health care demand was highly responsive to user charges, especially at the lower end of income groups (see especially Gertler and Van der Gaag 1990). This later study cautioned that a large drop in service utilization by the poor would result following implementation of even modest user fee in government health facilities.

Most of the empirical studies of the discrete demand for curative medical care condition estimation on individuals having reported themselves sick especially in studies of low income populations (see Akin *et al*, 1986a,b, Gertler and Van der Gaag, 1990, Lavy and Quigley, 1993 and Mwabu, Ainsworth and Nyamete, 1993). Akin *et al* justify this by arguing that healthy people will not demand curative care. Ellis and Mwabu (1991) provide a notable exception to this literature, as they focus attention on the effects of demographic covariates on the probability of falling ill as well as on demand behaviour once ill. However, they do not discuss any possible correlation between unobservables in the health demand and the health demand equations.

Mwabu (1997) in his paper on user charges for health care reviews the theoretical basis for the application of user fees in the public health sector in low-income countries with particular reference to the special characteristic of medical care as a commodity. Empirical health demand studies in developing countries have tended to use complex econometric models (see for example, Akin *et al*, 1987, Gertler and Van der Gaag 1987, and Ellis and Mwabu 1991). In contrast to past research in this area, we used a sample model, that yielded results very similar to those other researchers have obtained using more complex formulations.

As our results, however, critically depend on the assumption that determinants of health care demand other than user charges remained constant during the period analysed, we constituted our model in a manner designed to permit a check of this assumption's validity. Though the reform activities started on a small scale in 1989 following the introductions of the cost-sharing programme, the start-up activities can be traced back to 1993 and publication of Kenya's Health Policy Framework (KHPF) document approved by cabinet in 1994 that was launched by the Minister for Health in the same year; and the work plan to operationalise KHPF drawn up in 1996 and Health Reform Secretariat established during the same year to

play a catalytic role in the implementation of these plans. Thus, little in terms of tangible progress was visible until late 1996.

We conclude from the literature review that cost sharing programmes have drawn a lot of interest as people attempt to understand the impact of their implementation on the demand for health care especially by the poor. Some studies have shown that cost sharing can have positive effects on service use. Others have indicated that while price elasticity of demand may be small, the impact of higher fees when introduced may be greater among the low-income groups than the rich. At the same time, others have not been concerned with the technical analysis of the feasibility of cost sharing programmes. Instead, they have focused on the political economy of user fees and tried to show that due to class dynamics and processes that tend to work against the poor, provision of health care or resource allocation would be in favour of the rich or the dominant class.

Empirical work on the effect of price on demand for health care in Africa tended to show low price elasticities of demand and concluded that health care financing reforms undertaken in the early 1980s would not have a negative effect on the demand for curative care services. But these findings were contradicted by findings of a later stream of studies which produced evidence showing high and statistically significant price elasticities of demand for curative care services.

Despite merely pointing out the differences and contradictions in the results of previous studies on health care demand, this literature review has revealed that such differences may have arisen due to errors of measurement and to omission of unobserved factors from demand models. Another problem with the previous studies is that they were conducted too soon after introduction of user fees and thus could not have measured the full effects of the reforms. This thesis addresses these concerns. Another problem in the literature is the omission of the role of politics in the reform process. Since the political process is key in the implementation of reforms (Mwabu, 1995) there is need to analyse the role of power structure in the design and implementation of health sector reforms. To that end, Chapter four discusses political economy issues in health care reforms in Kenya.

CHAPTER 4

THE POLITICAL ECONOMY OF HEALTH CARE FINANCING

This chapter examines the political economy in which the health financing reforms are embedded. It starts with a look at the political economy issues that emerged as a result of the implementation of reforms. Political economy as discussed in the chapter examines some of the concerns and actions that were taken by the government, civil society and by the grass roots organisations to mitigate against the adverse consequences associated with the implementation of the policies. In addition, the analysis looks at the individual, institutional and national capacities instituted to respond to the concerns raised regarding the implementation of user fees and other reforms by the different interest groups.

4.1 Approaches to Provision of Health Care

Provision of health care constitutes one of the basic human needs and contributes significantly towards enhancing and maintaining the productive potential of a people. Provision of better health care as such contributes towards positive impacts on longevity, adult productivity, earnings, quality of life and socio-economic development (World Bank, 1993 p.17). In appreciating the above understanding, the Kenyan Government has continued to design appropriate policies aimed at the provision of appropriate health care. Most of these policies are articulated in the Health Policy Framework paper launched in 1994 which details clear strategies, objectives and priorities in the management of Kenya's health care system.

Historically, most independent African governments embarked on ambitious plan of providing free medical services. This was given support by the launching of Health for All Movement – in 1978. The public sector remained dominant in the provision and financing – with very little growth and expansion of the private sector. In a number of successive policy documents, especially development plans, the Kenyan government repeatedly expressed its commitment towards providing health care services as a basic need for all Kenyans. In support of the policy objective, budgetary allocations to health increased in absolute terms over the years. The Ministry of Health's recurrent budget for 1979/80 fiscal year rose from Kenyan pounds 43.0 million to 351 million in 1996/97. During and throughout this period of public sector dominance and expansion of health services, the non-governmental sector was less exploited due to weak institutional links between the government and the Non-Governmental Organisation (NGO) sector. The input and opinion of the NGO sector was less solicited and incorporated in policy formulation.

The 1980s and 1990s witnessed a shift, driven by fiscal and ideological concerns way from comprehensive social guarantees through welfare state toward multiple and diverse forms of provision, delivery and financing of health services. This shift has involved a declining role for the state and a corresponding increase in provision or financing through mechanisms such as insurance, private pensions, and user fees. In many parts of the world undergoing economic adjustment, transition or recession, there has been a heavy reliance on private family or kinship networks in providing basic guarantees of livelihood security during periods of economic or social stress. There is likewise an increasing role for civic or community organizations. This emerging welfare pluralism is frequently presented as a new approach to welfare provision. In fact, individuals, households and communities have long been engaged in the provision of social and economic security through a range of informal and semi-formal mechanisms. Currently, the

NGOs make a substantial contribution to Kenya's health service provision as reflected by, among many others, its dominant representation in health clinics, maternity and medical centres. The NGO sector has developed rigorously over the past twenty years. This growth can be attributed to the Government's decision to allow civil servants to engage in private practice (commencing from the 1970s), an upward revision of the National Hospital Insurance Fund (NHIF) rates and deterioration of the public sector terms of service. Since launching the Health for All approach, there has been dramatic change in the original setting for primary health care implementation in Kenya. Within the health sector the above-mentioned challenges alongside mismanagement and inefficient use of resources have jeopardised meeting the intended target of health for all.

During the past decade, the health care delivery systems and services in developing countries, Kenya being no exception, have experienced daunting challenges largely due to economic, social and other external factors characteristic of the period. A harsh economic climate coinciding with a critical phase of demographic transition has given rise to imbalance between the demand for and supply of health services. This, in turn, has resulted in unmet health needs. Nevertheless, the Kenyan Government, through various health care reforms, is likely to meet the challenges facing the health sector.

Since launching of the Health for All Movement, a global economic recession and political pressures have largely changed health care financing. Equally, the economic crisis and subsequent restructuring measures have seriously weakened the health and social sectors. Rapid population growth, new emerging diseases, resurgence of epidemics, natural and man-made disasters, have confronted health systems with challenges for which they were not prepared, thus calling for health care reforms. In responding to these challenges, the Kenyan Government,

through the Ministry of Health, had to re-define its health policies and restructure its institutions and the direction of these reforms.

Health care financing reforms in Kenya as in other developing countries have taken a number of patterns mainly involving budget cuts and expenditure rationalisation and developing more sources of revenue. All these methods or some combination of them are at different stages of development and implementation in most of these countries. In Kenya, budget cuts and expenditure rationalisation have invariably followed spending cuts for social services contingent on adjustment policies championed by the IMF and World Bank. Since Kenya, like most of the developing countries, relied on budgetary allocations from the treasury and exchequer as the main source of financing, adjustment policies thus necessitated rationalisation of expenditure for health. The major features of the rationalisation policies have been development of public investment programmes or sector investment programmes and sector-wide approaches with the intention to enhance better allocation and targeting of financial resources for health.

Implementation of reforms was characterised by negative reaction and shortcomings all related to institutional bottlenecks (structures, competencies, and political will) to carry out the reforms. For example, there are certain factors that negatively affected the acceptance of user fees. Key among these included low incomes and increased poverty among households, and the history of health financing in Kenya. Also, poorly developed systems of administration, information and socio-political circumstances tended to limit efficiency of targeting in the program. As a result, there were initial rejection – reflected in bad press and rejection by politicians and leaders.

User fees have themselves been proved to be regressive and lead to welfare loss and increased reliance on them as sources of finances should be complemented with strong mechanisms for

targeting in order to ensure some equity. In a study of the willingness to pay for health services, Gertler et al (1987) concluded that user fees are regressive both in terms of access and welfare. They suggested adoption of price discrimination as a possible solution to welfare problem. Other studies have also revealed constraints due to information and administration as hindering targeting under user fees programs. For example, Gilson et al., 1995 concluded that reaching the poor through public policy is not a simple process of aiming at a target. The constraints to targeting under cost recovery programs indicate a strong need for developing broad programs of social insurance in order to balance fiscal constraints facing the health sector with well-defined social objectives.

Furthermore, as the role of the private sector is expanded there also arise concerns regarding efficiency in the allocation of resources between primary care and other health care needs. The private sector may not have a strong incentive to under take provision of primary health care. In addition, the private sector's full potential is yet to be developed due to weak institutional links between the government and the NGO sector. Geographical coverage by the private sector is limited due to inadequate incentives and burdensome regulation.

This analysis looks at the implementation of these policies and the issues of political economy that have emerged as a result of these measures. Political economy is considered to refer to some of the concerns and actions taken by the government, civil society and communities to mitigate against the diverse consequences associated with the implementation of these policies. There are issues of individual, institutional and national capacities and capabilities to respond to the new policies in order to derive positive and desirable benefits.

4.2 Chronology of Events leading up to Reforms

This section discusses the social and political environment in Kenya in which the health care financing reforms involving new and enhanced user fees, were implemented. It provides the analysis of some of the decisions that were taken to address the political economy of user fees implementation. In addition, it highlights some of the important events, positive and negative, that took place in response to the introduction of new fees for health services, and which may have promoted or undermined the process of implementation. In Kenya and other African countries, the governments historically (at the time of independence) promised and were committed to universal and free access to health services, relying on tax revenues as the main source of financing. The objective was to protect and ensure access to services by the poor. In Kenya for instance, the Government withdrew the outpatient attendance fee of Kshs. 5, but retained other sets of fees such as for inpatient treatment, medical examinations, and other selected outpatient charges.

The fees, however, were poorly enforced and the revenue contributions remained low. More decisive and forceful policy discussions regarding charging for health services were first contained in the *National Development Plan (1989-93*). The argument was to make people more responsible for their health, and that considerations for free services had changed somewhat and there was no basis to continue providing free health services. In addition, it was realized that the increasing burden of providing the services free was becoming untenable due to budgetary constraints facing the Government. As already discussed elsewhere, the Government introduced a new and enhanced fee schedule in 1989. The chronology of fee implementation events in Kenya was as follows:

Policy of universal (but not necessarily entirely free) access to medical services; pre-independence attendance fee discontinued but nominal inpatient and selected outpatient charges continued up to 1989; National Development Plan (1989-93) advocates for health cost recovery; new fee schedule introduced in December (1989) as cost sharing; September outpatient registration fees suspended, but all other charges remain; and June the same year, phased reintroduction outpatient fees but coupled with strengthening of the programme of FIF beginning with Provincial General Hospitals.

In the report of an inter-country meeting of November 20 to 23, 1995 in Tanzania, on achieving evidence-based health sector reforms in sub-Saharan Africa, a vital consideration was placed on the urgency of moving forward with health sector reform. The reform process was thought to consider the link between the development of essential support infrastructure with priority disease control, and should constitute the basis of planning, implementing and monitoring health sector reforms in sub-Saharan Africa.

In view of the above, a series of health reform programmes and a number of activities were agreed to be undertaken at the in-country level. These included: situation analysis, development of a comprehensive health policy and related strategies, management of various financial options, definition of the role of the private sector, and improvement of the effectiveness of service delivery. Other issues to be tackled also included availing of essential drugs, improvement of physical infrastructure and equipment, and integrating health promotion and protection.

A key area of health care reform revolves around the policy focus on financing the health care services. The policy desire has a bearing on promoting increased participation of other

stakeholders in the financing of health services. This is a deliberate move to increase the resource flow to the sector. The attainment of this policy objective may entail the provision of incentives to private and NGO health providers in order to engender their increased involvement in health care provision. Indeed, there is urgent need to strengthen this policy in order to harness additional resources from the private sector.

Most countries that have embarked upon the implementation of user fees have done so to achieve interrelated objectives: to generate revenue; to improve quality of health services; and to increase access to services. However, achieving these objectives is not easy. For example, while the principle behind the policy change may be clear, its implementation could worsen the situation that is the target of policy. In most countries the desire to improve the acceptance of programmes has led to the setting of low fees and the inclusion of elaborate exemption procedures. Such generous exemptions undermine the revenue-generating potential and the extent to which it can be relied upon to improve the availability and quality of health care services. At the same time, the acceptance and image of such programmes invariably depend upon quality improvements and assured access to services by the needy. Because revenues remain low, quality of care tends not to improve with charging. In certain cases, the measures for ensuring access to care have failed to guarantee use by the people they are intended to protect. These failures tend to lead to discontent and in some cases have resulted in suspension and termination of the programmes.

User fees complemented by decentralisation and combined with measures to protect the poor and exemption mechanisms, and use of fee revenue to improve the coverage and/or quality of the service needed and used predominantly by the poor, can enhance the political economy of the policy change. Fees have the potential to promote equity since the provision of services

financed by taxation and free at point of use is characterised by bias in favour of urban-based, curative and tertiary level care, and so has represented a regressive public subsidy to wealthier groups. Higher income groups use such services proportionately more than the poor and yet can afford to pay more for them than they do under existing financing systems. A more equitable, and at the same time efficient, financing system would charge those who can afford to pay and would target subsidies to the poor, reducing wastage of benefits on the rich and decreasing the cost of assisting the poor.

4.3 Power Structure and User Charges for Health Care

The on-and-off cost-sharing policy since Kenya's colonial era can be explained by the conflicting interaction between economic and political groups in society. Prior to 1957 government health services were supposed to be free for Africans except for those in employment whose employers were supposed to meet their medical expenses (Mbai, 1992:55). In 1957, however, the colonial government introduced fees for its health services to help finance the rising health care expenditure. The introduction of the fees was politicised by the nationalist politicians as a strategy to deny Africans access to modern health care.

The political perception of the fees is reflected in the Kenya African National Union Manifesto of 1960 and its reversal (for out-patient services, on 1st June, 1965), two years after the country attained independence in 1963. Financing of free outpatient services in government hospitals, however, could not be sustained into the 1980s due to the country's demographic explosion, macro-economic crisis, declining flow of foreign aid, and rising cost of foreign commercial loans. The crisis in the financing of medical services in government hospitals, reflected in congestion, untidiness and a chronic shortage of drugs, made it imperative for the Government to reverse the policy again in December 1989 under the health care financing programme. The

to reverse the policy again in December 1989 under the health care financing programme. The hurried process of reversing the policy was top-bottom with the initiative coming from the Bretton Woods institutions. Discussions on the reversal of the policy were limited to government officials and the Cabinet. Although the Cabinet approved the reversal of the policy, triggering off necessary implementation activities, political will and commitment for it were generally not strong. This was clearly manifest in the abrupt reversal of the policy again in August 1990 by the President on political suspicion of its likely adverse consequences on the poor and other vulnerable groups in society. The policy was again reversed in 1992 after being redesigned to make it politically acceptable. The process of designing and implementing the user fees in Kenya can be associated with six phases: Pre-User Fee Phase, 1963-1989, USAID - Funded Pre-Programme Phase, 1988-1990, Early Implementation Phase, 1989-1991, Systems Development Phase, 1991-1992, Acceptability Phase, 1991-1993 and Accountability Phase, 1993-1995.

A cost recovery package consists of various financial systems. This is mainly user fees complemented by decentralisation combined with measures to protect the poor; an exemption mechanism and use of fee revenue to improve not only the coverage, but also the quality of services needed.

The exemption mechanism protects the low-income groups from full cost of care and ensure that fees are levied on those able to pay. It guards against inequity in access and utilization of public health care due to the differential ability to pay at the individual and household level. Exemptions also consider only access to essential, government-financed services, ignoring patterns of access to and utilization of private care. The resources generated by fees (and

reviewed primarily on those able to pay) can in contrast be used in ways that influence overall utilization patterns.

Decentralised decision-making supports these changes by facilitating the use of revenue in ways that meet locally-determined health care service needs and community- perceived quality weaknesses. In addition, decentralised screening within targeting programmes potentially has greater accuracy advantages than centrally administered systems, since a symmetry of information between applicant and administering agent about applicant's economic status is likely to be smaller. The process of targeting through exemption and appropriate use of revenues is the critical element in the theoretical arguments suggesting that rational cost recovery programmes can have positive equity impact. Targeting permits the poor to benefit disproportionately from public health care provision financed by user fees.

For the poor to benefit in revenue use, there are three critical aspects which need to be taken into account: Firstly, the targeting proposed by fee proponents requires that exemption mechanisms be complemented by use of fee revenue to improve the health care offered to the poor. The effectiveness of this reform of targeting can be judged by whether the revenue raised by fees is used to disproportionately benefit the poor, by strengthening the services most relevant to their needs, i.e. primary care. Secondly, local retention and control of at least some portion of the revenue is the distinguishing feature of community financing. It provides incentives for cost recovery and allows revenue to be used in ways that meet perceived quality weaknesses. Thirdly, the adequacy of fee revenue is perhaps most important to the effectiveness of its use. The introduction of user fees can only improve the care offered to the poor if the revenue generated is sufficient to allow the coverage or quality improvements necessary in any particular context.

The implementation of the above health reforms will be quite a challenging process. It will entail not only significant organisational change, including creating and rendering functional, appropriate, effective operational and managerial structures, but also careful and effective prioritisation of activities carried out aimed at realising the reform objectives. Furthermore, the mobilisation and management of substantial resource inputs and the institutionalisation of effective procedures for monitoring and evaluating the health reform process will be essential. It is also important to recognise that the implementation of health programmes, whenever possible should build upon the ongoing programmes and activities that are consistent with the health reform agenda. To this end, public information is considered vital in order to ensure that the reform process is properly understood, by both the beneficiaries and the actors who will be involved. This needs to be followed by establishing health reform institutions, marketing the health reform plans, strengthening of health service delivery, and financing and management.

The country has made remarkable strides in the development of the health system, though several problems continue to undermine the capacity of the health sector to ensure adequate availability, quality and access to health services. Poor health still prevails and the objective of attaining Health for all by the Year 2000 is obviously not attainable. To enhance appropriate and adequate health care provision, several changes and innovations are required to overcome the deficiencies in the health sector. What appears to be lacking are actions that could turn the policy objectives into results - a factor that is symptomatic of a lack of will and commitment. In addition there is the need to be cognisant of the negative attitudes of health staff, weak management skills and gross interference by the politicians and others that have vested interests in the health sector. Good governance is also required to create an enabling environment and to guarantee these groups adequate protection.

Reform is of critical significance to the Kenyan health sector. It is a sustained process of fundamental change in policy and institutional arrangements, based on scientific evidence, guided by government and designed to improve the functioning and performance of the country's health sector and ultimately the health status of the population. The Kenya Government's visionary nature of the Health Policy Framework Paper of 1994 needs to be translated into action and this requires the orchestration of a wide variety of organizations, interested groups and individuals, both within and outside the Government. This requires a number of critical steps which must be taken immediately. These are both strategic and operational in nature and begin with a recognition that there must exist a legal mandate and institutional focus for reform within the Ministry of Health.

An important insight from this Chapter is that user fees are not set entirely by the market forces as is assumed in neo-classical theory of health care demand. Politics, especially the prevailing power structure, influences the level of fees levied both in the public and private health care structures and in turn it affects the level of health services utilisation by various social groups. However, for analytical convenience, political variables are omitted from a model of health care demand developed in Chapter five; it is recognised that these variables are key in a more encompassing model.

CHAPTER 5

ANALYTICAL AND EMPIRICAL FRAMEWORK

5.1 Introduction

The aim of this section is to specify a framework for assessing the impact of cost sharing on the welfare of the population. We use the more general welfare function involving the use of health services and other goods and services as arguments. In the model, health care utilization directly affects welfare; it is assumed that the welfare of the population is affected by the consumption of health care services, as other goods and services are held constant. The demand for health care is itself determined by its own price and prices of other goods and services – as well as by a set of socio-economic, demographic, facility-specific characteristics and distances between facilities. In the analysis, health care is treated as any service or good in the market where ceteris paribus, the quantity demanded is affected by its own price. Other things being equal the own price (user fee) is expected to lower the utilization of health services in public health facilities. Despite being modest, the new fees represented a significant proportional increase – as they were changed from "low" or "no charges" – to Kshs 20-40 in district health centres and dispensaries and are thus expected to have induced a drop in service utilization. We also believe that the expectation created at Independence that the government would provide "free" medical services, together with the perceived poor quality of care at public facilities even after the introduction of user charges induced a negative reaction to the fees.

The demand for health care is expected to be directly related to the income of the population – with the direction of the relationship being positive or negative, depending on whether health

care is a normal or inferior good. Changes in structural variables, especially the facility specific factors that are proxies for quality are expected to shift the demand curve for health care. The improvement in quality of health services may shift the curve outward or inward depending on the effect of quality on disease condition, and on decisions to seek care. If quality improvement increases the cure rate, repeat visit would be unnecessary and attendance would be lower at any given user fee. However, an improvement in service quality may make the first visits worthwhile, and thus shift the demand curve outward.

The distance variable in the model specified below measures proximity between facilities - typically between a facility and its competitor. It is treated in the model as a rough indicator of the information the patient (the household) possesses about the services being offered at health facilities.

5.2 Model

In general, the welfare of a household depends on the consumption of health care and other goods and services. The relationship between people's wellbeing, health service utilization, the consumption of other goods and services, over a given time period can be summarized as follows:

$$V = f\ (Q, \Omega) \qquad (1)$$

where

V = household welfare;

Q = quantity of health services;

Ω = all other goods and services, apart from health care.

Maximisation of the above welfare function subject to the wealth constraint of the household leads to ordinary demand functions for Q and Ω. We make a simplifying assumption that the Ω

argument in the welfare function is a constant, and then estimate a medical care demand function of the following general form:

$$Q_{it} = f(P_{it}, Y_{it}, A_{it}, S_{it}, D_{it}, Z_{it}, \varepsilon_{it});\ i=1, ...N, t=1,.. T \qquad (2)$$

where

Q_{it} = Utilization of health care services, at the ith facility at time t;

P_{it} = Vector of own price (i.e., price of health care at a facility), and prices at alternative facilities and price of food in the catchment area for facility i at time t;

Y_{it} = Per capita income in facility i's catchment area at time t;

A_{it} = Vector of socio-economic characteristics of households within the catchment area for facility i at time t (e.g, assets, household size, education, gender);

S_{it}= Vector of characteristics of facility i at time t (e.g., number of doctors, medical equipment, etc);

D_{it} = Distance between ith facility and competing facilities at time t;

Z_{it}= other factors influencing health service utilization such as interaction terms after cost sharing and zero otherwise);

ε_{it} = Error term for the ith observation at time t.

5.3 Estimation Techniques

There are unobservable factors in vectors A_{it} and S_{it} in equation (2), such as peoples' perception about quality of care and attitudes of health care providers towards patients, which can cause shifts in health care demand. These unobservables may account for demand shifts noted in Chapter seven. To estimate the above model, two pieces of information are needed: data on demand and on determinants of demand. In addition, a precise mathematical form of it is needed. The regression model to be estimated can be expressed in short-hand version as in (3) below.

$y_{it} = \beta x_{it} + u_{it}$ i =1, ...,N, t = 1,..... T..... (3)

where

i denotes the ith observation (in this case, a health facility); t denotes the time period (t=1...T);

y_{it} is quantity of outpatient and inpatient medical care demanded at ith facility at period time t as already noted; ß are coefficients to be estimated; x_{it} is a vector of covariates that determine the level of utilization of health services at facility i at time period t; and finally, u_{it} is a disturbance term such that $u_{it} = F_{it} + v_{it}$. The component, F_{it}, is time-invariant and denotes the unobservable health facility-specific factors, while v_{it} denotes the remainder of the overall disturbance and obeys the usual assumptions of classical regression analysis.

In fixed effects (FE) models, F_i is assumed to be a fixed parameter to be estimated, with v_{it} IID $(0,\sigma^2)$, that is v_{it} is "white noise" and it is assumed independent of x_{it} for all i and t. However, the FE least squares method, also known as least squares dummy variables (LSDV) method suffers several shortcomings including large loss of degrees of freedom as (N-1) extra parameters are estimated; too many dummies that could aggravate the problem of multicollinearity among the regressors; and failure to estimate the effects of time-invariant variables. To circumvent these problems, a random effects (RE) model is specified with both F_{it} and v_{it} being assumed to be white noise (i.e., both F_{it} and v_{it} are IID $(0,\sigma^2_F)$ and IID $(0, \sigma^2_u)$ respectively, with x_{it} being assumed independent of both F_i and v_{it} for all i and t. The demand models for outpatient and inpatient services were estimated using OLS, robust and GLS (with fixed effects) methods. The estimation results are used to analyse levels in health services

utilisation: the issue of how health service consumption is distributed in the population is not captured by the model.

5.4 Hypotheses

The key hypothesis of this study is that other things being equal, an increase in user fees reduces health service utilisation and hence household welfare. On the basis of the existing literature on health services utilisation, it is further hypothesised that demand for health services in Kenya is price inelastic. Table 5.1 summarises the expected signs of the behavioural coefficients to be estimated.

Table 5.1 Summary of Variables included in the demand equation

Variable Name	Expected Sign of Estimated Parameter.
Utilisation of heath care services dependent variable (outpatient and inpatient visits)	n.a.
Own Price (i.e. price of health care services)	Negative
Price of the competing health service	Uncertain
Price of food in catchment area	Positive
Per Capita income of households within the catchment area	Positive
Socio-economic characteristics of households - household size	Uncertain
- sex ratio	Uncertain
- literacy rate	Uncertain
Supply characteristics within a facility - personnel (number of doctors, nurses)	Positive
- equipment (number of x-ray machines, stethoscopes)	Positive
Ecological and epidemiological characteristics in the catchment area - rainfall, temperature	Uncertain
Distance between health facilities	Negative

The demand effect of the price of a competing facility is negative if the services are substitutes and positive when the services of the facilities are complementary in consumption. It is assumed that an increase in the price of food increases malnutrition in the community and hence mobility leading to an increase in attendance at health facilities. Hence the expected sign of the

coefficient on food price is positive. Similarly, demand effects of household size, literacy rate, sex ratio, rainfall and temperature are difficult to be determined a priori. For example, an increase in rainfall might increase the number of mosquitoes and malaria. At the same time it might improve the quality of drinking water. Depending on which of these effects are dominant, attendance at the health facility would increase or decrease.

To estimate the demand model in equation (3) and to test the hypotheses indicated in Table 5.1, panel data is required. Chapter six details the types of data needed as well as the methodology for collecting them.

CHAPTER 6

DATA COLLECTION METHODOLOGY

6.1 Data type and data sources

The data set used in the thesis was derived from records of a random sample of health facilities, covering all levels of both government and non-government facilities, namely; hospitals, health centres, and dispensaries. Roughly the number of health facilities (20-23) was selected randomly from a purposively selected urban district and three rural districts for the period 1986-88 (3 years before introduction of the reform) and for the period 1989-95 (7 years after its introduction). A multi-stage sampling design was used to select the overall sample of 91 facilities, but one facility was subsequently dropped due to lack of data. At the first stage, one urban and three rural districts were selected; selection was not random, but purposeful at this stage. The urban district selected for the study was Nairobi, while the rural districts selected were those in provinces contiguous to Nairobi, namely; Kajiado (Rift Valley), Machakos (Eastern) and Kiambu (Central). (See Appendices Tables 3a, b, c, d and Appendices Figures 1,2,3,4,5). The rural districts were required to be contiguous to Nairobi in order to facilitate examination of changes in the pattern of health service utilization as one moves from a primate urban area to a rural area. Furthermore, the contiguity of rural study sites to Nairobi should facilitate examination of the impact of rural-urban disparity in service improvements on utilization of urban services by both urban and rural populations because urban services are accessible to the rural population. Moreover, the contiguity property ensures that the population has information about the quality of services of urban facilities, which is expected to be greater than that of rural facilities due to initial physical and personnel endowments of urban facilities.

At the second stage of sampling, an equal sample of 11 government and non-government facilities was selected at random from the universe of facilities in each of the four study areas noted above. At the third stage of sampling, in each district, a sample from each facility type (i.e., a district hospital, a health centre and a dispensary) was selected, again by simple random sampling. The number of each facilities selected from each level was dependent upon the existing number of each facility type relative to the overall number of health facilities in the study area.

The sampling frame for the selection of the facilities was a list of all medical facilities in the country, obtained from the Ministry of Health (MoH). The frame is organised in terms of strata of facilities; namely, district hospitals, health centres and dispensaries. For each of the strata, the frame indicates the public and private sub-strata facilities. Being relatively few, all the district-level facilities in the four study districts were covered. The sub-district level facilities (health centres and dispensaries) were sufficient in number to be adequately sampled. For each of the health centre and dispensary strata, a proportional sample of facilities, depending on the relative number of facilities, was selected using random number tables.

Using either one or two digits of the random numbers in the tables, and the numbers of facilities in the frame, we were able to fill the sample size for the study. During the pilot survey, however, it was discovered that some of the sampled facilities had either ceased to exist or had been in existence for less than two years. It was deemed necessary to replace these, where possible, by similar ones in the same general locality. The final list of facilities selected for the study and for which relevant survey data was collected is summarised by district.

6.2. Sample Selection

One set of questionnaire was designed for collection of the secondary data. The set of questionnaire was used to collect the quantitative data on Kenya. Actual collection of data was conducted between July and December 1997 with the help of two trained research assistants.

The data collected was pooled over a cross-section of facilities over time. The stack of panel data for one year for each district is as shown in (Appendix 5).

6.3 Variable Descriptions and Derivations

The information was collected on service utilization (outpatient and inpatient attendance per year); price of health care services in a facility and provider characteristics, and were collected directly from the facilities using facility annual reports and personal interviews with facility management. The data on utilization shows the total number of outpatients attended to in each facility per year from 1986 to 1995. In-patients are also indicated where applicable. This data was obtained from the records of utilization at district level. The data on own prices (P_1) were obtained from accounts departments of the district hospitals. The revenue collections started in 1989 when cost sharing was introduced, but before that no revenue was accrued to the hospitals and health centres. The dispensaries do not charge patients and, hence, have no revenue. Given the revenue and the utilization data, own price of health care services at a facility was derived as a ratio of total revenue to utilization (number of visits). The price variable therefore, is an average price, which may not be independent of service quality.

The set of provider characteristics (S) consists of several elements. The data on actual personnel employed in the facility was collected from each health facility directly from the

annual records kept in its various departments. Data on budgeted personnel from either the private or the government health facilities, was unavailable. The categories of personnel, such as specialists, doctors, clinical officers, nurses, and midwives, provide an indicator of the type and quality of service offered by each facility. Data on equipment was obtained directly from the annual records maintained by each facility. Here again, only actual data was available. Types of equipment and numbers of working units, from the more commonly used, such as thermometers, through to more sophisticated equipment, such as X-ray machines and cardiac monitors, provide a good indicator of the level and quality of service.

Data on facility-specific characteristics was collected on personnel employed in each facility and on types and numbers of working units of equipment (such as thermometers, through to x-ray machines and cardiac monitors). This was used to indicate the level and quality of service offered by each facility. Only a few of these variables are included in the demand model estimated here. The price of food is average of prices of food items collected from markets within the facility's catchment area.

The socio-economic characteristics of households (A), such as overall family size, sex ratio, and literacy rate were obtained from demographic characteristics of a facility's catchment area. Average literacy rate of the population in a catchment area in each of the four districts is indicated by the number of years of formal education. The average number of years of formal education was derived on the basis of the 8-4-4 education system and the 7-6-3 system. Both systems entail a total of 16 years of schooling from Standard 1 to completion of the first university degree. Data on distance between health facilities was collected via interviews with facility management and from cartographic records. The distances between

the nearest health facilities were measured from topographical maps (1:50000 and 1:100000) for the four districts under study. Physical measurements also had to be taken in cases where the health facilities were located in close proximity to each other, especially in major towns. In all cases, the distances were obtained using the most direct routes between the health facilities. Data on a large number of variables, not described here (and to be used in the larger study) was sourced from the Central Bureau of Statistics, the statistical office of the government.

Data on other covariates was not available at facility level and, therefore, was obtained for the catchment area of the facility, indirectly, and from other sources including reports of the Central Bureau of Statistics (CBS), Ministry of Education, Ministry of Agriculture and Livestock Development, Co-operative Societies, Provincial and District Administration, and Meteorological Department. The price of competing health services (P_2) was computed as an average of those prices charged by the alternative health facilities within the facility's catchment area. In the study areas, competition in health services was between public and private facilities. A competitor of a given level of public (private) facility was defined spatially as that private (public) facility nearest to it. Hence, the prices of the competing health services were generated as the own price of the nearest competing facility. The average price of food (P_3) was computed as an average of food items collected from markets within the facility's catchment area. Maize was the main food crop in all areas. The actual prices of maize per 90Kg bag were extracted from the CBS records. The prices were determined from surveys done by CBS at the main markets located in each of the divisions under study.

Monthly average income (Y) was obtained from annual records of payments made by co-operative societies to its members in a facility's catchment area. In the case of Nairobi, data on income was obtained from tax returns. The average monthly income for each of the divisions covered was calculated from the income from wages and salaries, sale of agricultural products or livestock and other sources, divided by the population that is above 15 years of age. These figures were deemed to be representative of the monthly income of the divisions. In some areas, the average monthly income values were available directly from the *District Development Plans* for some years.

The meteorological and ecological characteristics (E) capture factors such as climate, soil types, agricultural potential of districts and epidemiological profile (disease patterns) of a facility's catchment area. Data on annual rainfall and temperature for the catchment areas of the health facilities were available from the Kenya Meteorological Services records. The stations within each catchment area were used for compilation of the data. However, there were some catchment areas without rainfall and temperature recording stations. For these the following arithmetic mean method was used to derive the missing rainfall data:

$$P_x = \frac{N_x}{n}\left[\frac{P_1}{N_1} + \frac{P_2}{N_2} + \frac{P_3}{N_3} + \ldots\ldots\ldots + \frac{P_n}{P_n}\right]$$

where N_1, N_2, ... N_n, are long-term averages for the closely correlated stations 1, 2, ... n, while N_x is the corresponding annual average value for the station with missing records. P_1, P_2, ... P_n, are the available records from closely correlated stations 1, 2, ... n, with P_x as

the corresponding missing record. The records indicate the daily, monthly and annual rainfall as collected in rain gauges located at the stations.

For temperature, the Thiesen Polygon method was used due to the non-uniform distribution of stations outside the catchment area (Thom, 1966). The values obtained compared well with the values shown in the respective agro-ecological zones for each catchment area. An agro-climatic zone is defined by the relevant agro-climatic factors and soil pattern with the aim of providing a framework for ecological land use potential. The zones given in the text are generalised for temperature belts defined according to the maximum temperature limits within which main crops in Kenya can flourish. Kenyan agro-ecological zones are depicted in (Appendix Table 4).

Data on distance between health facilities was collected via interviews with facility management and from cartographic records. The distances between the nearest health facilities were measured from topographical maps (1:50000 and 1:100000) for the four districts under study. In some cases, where the health facilities were not indicated on the maps, the distances were estimated using the kilometre readings of the fieldwork vehicle. Physical measurements also had to be taken in cases where the health facilities were located in close proximity to each other, especially in major towns. In all cases, the distances were obtained using the most direct routes between the health facilities. Data on wealth and average per capita landholding (W) were obtained from the Central Bureau of Statistics and also from the *District Development Plans*. In some areas, such as Kajiado District where livestock is considered to be wealth, the number of cattle per household was the proxy for wealth. This data was collected from agricultural records in the catchment area.

Population (Z) is the total population size within the facility's catchment area. The last variable is used to redress the sample selection bias problem implicit in our facility level demand analysis. Within the period 1986 to 1995, there was only one national population census done in 1989. This census covered the male and female population from the national to sub-locational level. Population at the different age cohorts was only available at district level, which gave direct data on population for 1989 only. Projections for the other 9 years were done assuming medium fertility decline and constant fatality, as recommended for the various districts and divisions by the Central Bureau of Statistics (1993). The assumptions of the projections are constant fertility and declining mortality from 1979 and 1989 census; and that growth rates for the whole district apply to the smaller administrative units such as divisions, locations and sub-locations. Comparisons of the projections obtained with those presented in District Development Plans were agreeable, with error margins of about 0.5 (5%).

CHAPTER 7

FINDINGS

7.1 Introduction

This chapter presents the findings of the study. It presents both descriptive and analytical results from the analysis of the data collected in four contiguous districts: Nairobi, Kiambu, Machakos and Kajiado. It starts with a presentation of sample statistics in section 7.2, which is followed by correlation results in 7.3. It concludes with a presentation and discussion of the regression results in section 7.4.

7.2 Health service utilization before and after cost-sharing

To provide a quick view of the impact of the cost-sharing on utilization of health care services, annual service utilization before and after introduction of cost sharing were computed and compared across and within types of facilities in the sample districts of Nairobi, Kiambu, Machakos and Kajiado. Results for overall average annual service utilization before (1986 – 88) and after (1989 – 95) the introduction of the cost sharing is summarized in Table 7.1 below. The findings in the table are consistent with the *a priori* expectation of a reduction in utilization of health care services due to fees. The table reveals overall reduction in average service utilization in the sample districts by about 25%. The data further shows that the reduction in annual service utilization was larger in government than in non-government facilities, which experienced declines of 33% and 17%, respectively. The large differential in service utilization at these two types of facilities is not surprising considering that the non-government facilities already practised some form or other of cost sharing. The reduction in utilization across all facilities after the introduction of cost sharing

was due to other factors also. In particular, per capita incomes fell during the cost sharing period (per capita monthly income was Kshs 841.3 before cost sharing and 652.1 after cost sharing). Furthermore, the inflation rate rose from around 12% in the 1980s to 46% per annum in 1993.

Within type of facility, the reduction in average annual service utilization was largest in hospital facilities. The annual service utilization in this type of facility declined by about 45% followed by health centre facilities with a decline of about 24%. This pattern of decline is consistent with higher fees that were levied at the hospitals and health centres.

Table 7.1: Overall Average Annual Service Utilization by Type of Facility (Standard deviations in parentheses)

Type of Facility	Average Annual Service Utilization		Percentage change
	Before Cost Sharing (1986 – 88)	After Cost Sharing (1989 – 95)	
Government Facilities	7211.20 (10508.59)	4811.61 (8475.12)	-33.28
Non-government Facilities	8806.31 (12332.39)	7287.19 (15205.89)	-17.25
Hospitals	22354.68 (19326.11)	12203.75 (9466.75)	-45.41
Health Centres	8629.24 (7637.78)	6534.82 (8231.45)	-24.27
Dispensaries	2903.58 (5307.12)	1627.88 (2160.13)	-43.94
Overall	7947.41 (11393.12)	5954.18 (12110.76)	-25.08

Source: Own calculations based on survey data

Table 7.2: Overall Average Annual Service Utilization by Type of Government and Non-government Facilities (Standard deviations in parentheses)

Type of Facility	Average Annual Service Utilization		Percentage Change
	Before Cost Sharing (1986 – 88)	After Cost Sharing (1989 – 95)	
A. Government Facilities:			
Hospitals	21556.47 (20374.18)	12000.51 (117148.88)	-44.33
Health Centres	8773.92 (7041.83)	7695.27 (10099.55)	-12.19
Dispensaries	2920.34 (6309.72)	910.87 (1071.07)	-68.81
B. Non-government Facilities:			
Hospitals	22853.56 (19071.85)	12330.77 (7859.31)	-46.04
Health Centres	8448.40 (8396.35)	5084.26 (4654.40)	-39.82
Dispensaries	2881.24 (3618.37)	2584.09 (2784.77)	-10.31

Source: Own calculations based on survey data

The aggregate impact of the implementation of the cost-sharing policy on utilization of health care services shown in Table 7.1 could mask differential changes in service utilization within government and non-government facilities. Information on changes in overall sample average annual service utilization by government facilities is summarized in Table 7.2 above.

The table shows a consistent reduction in service utilization across all types of facilities after the introduction of the cost-sharing policy. The largest reduction in the annual service utilization was recorded in the government dispensaries (68.81%), followed by government hospitals (44.33%) and by government health centres (12.9%). The large reduction in service utilization at government dispensaries appears surprising as charges were levied at all but this type of facility. This probably reflects existence of complementarity in use of different types of facilities.

Contrary to expectations, after the introduction of the cost-sharing in the government facilities, annual service utilization in the non-government hospitals also declined by even greater extent (46.04%), with the reduction in the non-government health centres (39.82%) being almost thrice that of similar government facilities. As already noted, the decline in service demand at non-government hospitals is probably due more to a fall in household's per capita income during the period of reform than to user fees per se.

The results for all districts shown on Tables 7.1 and 7.2 may mask differential policy impacts across districts, because of differences in district-specific spatial and socio-economic factors. To uncover these, information on changes in service utilisation after the implementation of the cost-sharing policy in individual sample districts was generated and is summarised in Table 7.3 below.

Table 7.3: Overall Average Annual Service Utilization by District (Standard deviations in parentheses)

District	Average Annual Service Utilization		Percentage Change
	Before Cost Sharing	After Cost Sharing	
Nairobi	8960.03 (13720.88)	8456.74(20431.69)	-5.6
Kiambu	10076.19 (13505.95)	8110.31(10202.16)	-19.51
Machakos	8565.15 (1058.66)	3734.08(5566.76)	-56.09
Kajiado	4447.65 (6603.15)	3049.58(3732.04)	-31.43

Source: Own computation based on survey data

The results from Table 7.3 are consistent with those shown in the previous two tables. Service utilization declined in all districts at the introduction of cost sharing, with the reduction being largest in Machakos District and smallest in Nairobi District. The results are not totally unexpected, because Nairobi has other factors that, apart from cost sharing, influence health care utilisation such as higher incomes and better awareness of health problems. (see Appendix Table 2 for details about Table 7.3)

13 Correlation results

Table 7.4 presents the correlation results. The results in the table show that income is positively correlated with the utilization of both outpatient and inpatient visits. This finding is consistent with prior expectations that people with more purchasing power use more health services. However, the correlation coefficient between the two variables is small (.1180); it indicates that a 10% increase in incomes would be associated with a 1.18% increase in health services use, and the vice versa. The correlation between distance among facilities and outpatient visits is 0.2760, which is larger than the correlation between distance and inpatient visits (.075). The correlation between the number of doctors and outpatient and inpatient visits shows the same pattern. In both cases, the correlation is positive, but larger and statistically significant for outpatient visits.

The correlation results show that income and visits, especially the inpatient visits, are positively correlated. The degree of correlations in both cases however is low – about 10–30%. The correlations of visits with user fees are statistically insignificant, and only the correlation for the inpatients visits has the expected sign.

Table 7.4: Correlation of health service utilization with Selected Variables (p-values in parentheses)

Variables	Correlation with log number of outpatient visits	Correlation with log number of inpatient visits
Log of per capita income in a catchment area	.1180 (.0037)	.2817 (.0000)
Log of fees at a health facility	.0418 (.4235)	-.0739 (.3110)
Log of distance between health facilities	.2760 (.0000)	.0749 (.2270)
Number of doctors at a health facility	.3047 (.0000)	.1028 (.0964)
Sample sizes	369-703	190 – 262

7.4 Regression Results

Next we present regression results. Three types of regression results are presented – the ordinary least squares (OLS), random effects (RE) and robust regression results. Table 7.5 presents the results for all the four study districts. The results for each district come next in tables 7.6 through 7.9.

Table 7.5:Overall Regression Results for Random Effects and OLS Models: Dependent Variable is Log of the Number of Visits (t-ratios parentheses)

Variables	Log Outpatient Visits		Log Inpatient Visits	
	RE	OLS	RE	OLS
Log of per capita income in a catchment area	.0851 (3.116)	.1274 (2.336)	.0900 (2.261)	.2014 (3.137)
Log of fees at a health facility	-.1849 (6.653)	-.1695 (5.823)	-.1986 (5.610)	-.3668 (8.831)
Cost Sharing (1=after; 0=before)	.1461 (3.656)	-4.33 (0.000)	.2084 (3.915)	.1773 (1.770)
Log of number of doctors at a health facility	.0343 (2.636)	.0402 (5.698)	.0366 (2.563)	.0591 (8.636)
Log of average household size in a catchment area	-.0254 (2.169)	-.1034 (7.311)	-.0176 (1.057)	-.0582 (3.416)
Proportion of females in a catchment area	-3.06 (0.306)	5.250 (2.686)	2.490 (0.233)	3.680 (2.473)
Log of distance between health facilities	-.1669 (2.763)	-.0544 (1.437)	-.1147 (1.582)	.0031 (0.077)
Constant	5.236 (38.177)	9.411 (21.330)	5.236 (28.136)	9.302 (19.223)
Sample Size R^2	339 0.204	339 0.333	180 0.350	180 0.476

Table 7.5 shows very low income elasticities of outpatient and inpatient visits. As can be seen from Table 7.5, the elasticity of outpatient visits with respect to income is about the same as the income elasticity of inpatient visits. A 10% increase in income increases outpatient visits by .85% and increases inpatient visits by .90%. In other words, a doubling of income (a 100% rise) would increase inpatient visits by 9% and the number of outpatient visits by 8.5%.

Given the very low income elasticity of visits, it would take a large increase in income to produce an appreciable increase in health services utilization. The correlation between user fees and visits in all the models is negative as expected - on the basis of the theory of demand. The price elasticity of demand is less than one in all the models, but much higher than the income elasticities. In the case of outpatient visits, a 10 per cent increase in user fees reduces outpatient visits by 1.85% and by 1.70% in the RE and OLS models respectively. These elasticities are slightly larger for the inpatient visits, which suggests that inpatient care is more responsive to user fees than outpatient care, which is somewhat surprising. The inpatient visits are more responsive to fees than the outpatient visits because inpatient and hospital-based care may be a luxury good.

The coefficient on the cost sharing dummy shows that health service utilization was higher during the cost-sharing period than before the implementation of cost-sharing in government health facilities. This increase in medical care usage might have been brought about by improvements in quality of services rendered (see Collins *et al*, 1996). However, the negative effect of user fees on service utilization was higher than the positive effect that may have occurred due to possible improvements in service quality. Thus, the net effect of the introduction of cost-sharing on service utilization was negative.

The results further show that the number of doctors at a health facility is positively correlated with the demand for health services. Focusing on the RE results, it can be seen that a 10% increase in the number of doctors increases outpatient and inpatient visits by .34% and .37% respectively. In contrast, the catchment areas with large household sizes are associated with low levels of outpatient visits. In particular, a doubling of a household size reduces the number of outpatient visits by about 2.5% which suggests that there may be scale diseconomies of household size in the utilization of health services. Intuitively, given budget

constraints and competing demands for household resources, those with large sizes are likely to use health services less even in situations where services are "free". Thus, introducing user fees is expected to create further disincentives for use of health services by larger households. Catchment areas with larger proportions of females are associated with higher rates of utilization of inpatient services, but this relationship is statistically significant only for the OLS model. This may be due to differences in health seeking behaviour between females and males reflecting unobservable factors between the two such as differences in health problems and related needs. Such factors may contribute to higher use of health services in catchment areas with larger proportions of females. Distance between health facilities influences the rate of utilization of outpatient services. As distance between competing facilities in a catchment area decreases, the demand for outpatient services increases. This is probably because close-by facilities share staff and treatment technologies, a situation that would tend to increase service quality and hence demand. However, demand for outpatient care is inelastic with respect to distances. In the RE model the distance elasticity of demand for outpatient care is -.1669, which indicates that a doubling of distance between health facilities would for instance reduce visits by around 17% which is a rather small change relative to the large increase in distance. Thus an increase in the density of health facilities would have to be very large to stimulate a noticeable increase in health service utilization.

Tables 7.6 through 7.9 provide information about the effect of cost sharing on utilization of health services in Nairobi, Kiambu, Kajiado and Machakos districts. In Nairobi, the introduction of cost sharing shifted the demand curves for outpatient services to the right (the coefficient of the cost-sharing dummy in Table 7.6 is positive). As in the overall regression (Table 7.5), the demand effects of income and user fees are positive and negative respectively. In Kiambu (Table 7.7) there is a similar pattern of effects, but the effects are generally insignificant. In Kajiado (Table 7.8) and Machakos (Table 7.9) service utilization was higher during the cost sharing

period, but notice that in both districts the coefficients on cost sharing dummies are insignificant, except for the RE results in the outpatient specification.

Table 7.6: Regression Results for Random Effects and OLS Models: Dependent Variable is Log of the Number of Visits (t-values in parentheses) - Nairobi District

Variables	Log Outpatient Visits		Log Inpatient Visits	
	RE	OLS	RE	OLS
Log of per capita income in a catchment area	.0419 (3.044)	.1145 (1.300)	.0559 (4.129)	.0665 (0.670)
Log of fees at a health facility	-.0355 (1.133)	.0137 (0.420)	-.0065 (0.266)	-.0885 (1.148)
After cost sharing (1=after, 0=before)	.1344 (4.275)	.2651 (1.554)	.0881 (2.979)	.3689 (2.019)
Log of distance between health facilities	-.07246 (1.452)	1.182 (7.726)	.0149 (0.283)	1.328 (8.748)
Constant	5.236 (34.173)	9.779 (12.223)	5.236 (30.564)	10.700 (11.038)
Sample size R^2	91 0.574	91 0.404	50 0.31	50 0.630

Table 7.7: Regression Results for Random Effects and OLS Models: Dependent Variable is Log of the Number of Visits - Kiambu District (t-ratios in parentheses)

Variables	Log Outpatient Visits		Log Inpatient Visits	
	RE	OLS	RE	OLS
Log of per capita income in a catchment area	.1208 (2.865)	-.2152 (0.703)	.2323 (0.726)	.2323 (0.472)
Log of fees at a health facility	.0110 (0.344)	- .1219 (0.733)	-.5884 (4.071)	-.5884 (4.071)
After cost sharing (1=after, 0=before)	.1247 (2.586)	.5703 (1.652)	-.0067 (0.022)	-.0067 (0.022)
Log of distance between health facilities	-.3828 (3.970)	-.6036 (2.507)	-.0462 (0.204)	-.0462 (0.839)
Constant	5.236 (25.623)	11.948 (5.249)	5.236 (4.212)	10.176 (4.212)
Sample Size R^2	63 0.091	63 0.135	45 0.510	45 0.296

Table 7.8: Regression Results for Random Effects and OLS Models: Dependent Variable is Log of the Number of Visits – Machakos District (t-ratios in parentheses)

Variables	Log Out-patient Visits	
	RE	OLS
Log of per capita income in a catchment area	.5048 (8.752)	.2588 (1.311)
Log of fees at a health facility	-.7614 (13.798)	.0904 (0.957)
After cost sharing (1=after, 0=before)	.0052 (0.078)	-.0546 (0.228)
Log of distance between health facilities	.1136 (0.885)	.1108 (2.727)
Constant	5.236 (16.255)	7.796 (6.123)
Sample size R^2	100 0.006	100 0.103

Table 7.9: Regression Results for Random Effects and OLS Models: Dependent Variable is Log of the Number of Visits - Kajiado District (t-ratios in parentheses)

Variables	Log Outpatient Visits		Log Inpatient Visits	
	RE	OLS	RE	OLS
Log of per capita income in a catchment area	-.2920 (0.884)	2.593 (6.130)	.7223 (1.064)	.7223 (1.064)
Log of fees at a health facility	-.2341 (3.344)	-.3036 (5.030)	-.2608 (4.186)	-.2608 (4.186)
After cost sharing (1=after, 0=before)	.1270 (0.693)	-1.034 (3.371)	.2076 (0.524)	.2076 (0.524)
Log of distance between health facilities	-.2573 (2.087)	.0358 (0.420)	.0240 (0.391)	.0240 (0.391)
Constant	12.320 (5.506)	–7.548 (-2.592)	5.236 (1.118)	5.236 (1.118)
Sample size R^2	85 0.099	85 0.440	37 0.435	37 0.435

In summary, the overall results in Table 7.5 and the district-by-district results (Tables 7.6 through 7.9) show that, other things being equal, health service utilization increases as income rises, and falls as the user fees are adjusted upwards. However, in both cases, the responsiveness of both outpatient and inpatient visits to income and fees is low, as indeed is shown by demand elasticities that are consistently less than unity in virtually all specifications. The results also show that although the introduction of cost-sharing shifted the demand curves rightward, thereby increasing service use (except for the RE results in the outpatient specification), the increase was not enough to offset the reduction in usage caused by higher fees. Thus, the net effect of the cost-sharing in the health sector was to reduce the level of utilization of outpatient and inpatient services. As shown by the R^2, the variables in the demand equations explain around 30-60% of the variations in health service utilization across the catchment areas. This rather low level of

planation is not uncommon in cross-section studies in health economics literature (see pecially Akin *et al* 1986a,b).

ables 7.10 and 7.11present the results for all the districts combined and for district- by-strict for slightly different specifications of the demand for health care. This is done to heck how sensitive the results are to changes in the specification of the demand function. In verall terms, the change in the specification of the demand model does not alter the results eported earlier in Tables 7.5 through 7.9. As can be seen from Tables 7.10 and 7.11, demand or outpatient and inpatient care is still inelastic with respect to user fees and per capita ncome. Furthermore, introduction of cost-sharing generally shifted the demand curve utward, but the shift was not large enough to outweigh the negative influence of higher fees n service utilization. In general, the pattern of effects of demand determinants noted earlier re all present in Tables 7.10 and 7.11, which suggests that the empirical demand relationship presented in previous tables is quite stable.

Table 7.10: Regression Results for the Log of the Number of Outpatient Visits (absolute ratios in parentheses)

Variables	Log Outpatient Visits (RE and OLS Parameter Estimates)									
	All districts		Nairobi		Kiambu		Machakos		Kajiado	
	RE	OLS	RE	OLS	RE	OLS	RE	OLS	RE	OLS
Log of per capita income in a catchment area	0.0851 (3.1160)	2.4490 (5.5950)	0.0502 (2.5560)	0.0684 (1.3136)	0.1511 (4.2900)	-0.0228 (0.1640)	-0.4250 (1.2960)	2.4490 (5.5950)	0.5075 (9.1420)	0.3469 (1.8580)
Log of fees at a facility	-1.8490 (6.6530)	-2.9020 (4.3300)	-0.1245 (3.7470)	-0.2856 (9.4330)	-0.0036 (0.136)	-0.0546 (0.7130)	-0.2210 (3.1440)	0.2902 (4.3300)	-0.7711 (14.5600)	-0.0820 (0.8390)
Cost sharing (1=after 0= before)	-0.1461 (3.6560)	-1.0500 (3.2470)	0.2216 (5.3040)	0.1866 (1.8350)	0.1552 (6.4250)	0.1347 (0.8490)	0.1476 (0.8230)	-0.1050 (3.2470)	0.0144 (0.2250)	-0.1010 (0.4500)
Number of doctors at a health facility	-0.3430 (2.6360)	0.0018 (0.1300)	-0.6310 (6.7760)	0.7220 (10.860)	0.1070 (1.0600)	0.1501 (4.8130)	-0.0007 (0.0250)	0.0018 (0.1300)	-0.8500 (1.7520)	-0.1690 (4.0500)
Log of average household size	-0.0254 (2.1690)	-0.0111 (0.3830)	-0.0116 (0.7430)	-0.0198 (0.4930)	0.0043 (0.4670)	-0.2152 (9.8020)	-0.0449 (1.1970)	-0.0111 (0.3830)	-0.0201 (1.4850)	0.0651 (2.3760)
Proportion of females in catchment	-3.0600 (0.306)	-0.3730 (0.790)	-6.6680 (1.071)	4.7370 (3.667)	1.7800 (0.638)	5.7670 (0.656)	-9.1780 (0.088)	-3.7370 (0.790)	3.8760 (1.572)	4.2460 (2.398)
Log of distance between health facilities	-0.1669 (2.763)	0.0114 (0.126)	-0.0036 (0.053)	-0.0862 (0.697)	-0.3690 (4.490)	0.2360 (1.759)	-0.2594 (1.907)	0.0114 (0.126)	-0.1312 (0.890)	0.2511 (4.411)
Constant	9.572 (38.18)	6.378 (21.33)	9.707 (46.84)	9.936 (20.85)	9.11 (9.96)	10.293 (6.06)	13.426 (5.99)	-6.378 (2.09)	6.881 (15.79)	7.136 (5.91)
Sample size	339	85	91	91	166	63	85	85	100	100
R^2	0.204	0.457	0.656	0.811	0.41	0.833	0.134	0.457	0.009	0.245

Table 7.11: Regression results ... ratios in parentheses)

Variables	Log Inpatient Visits (OLS and Robust Parameter Estimates)									
	All districts		Nairobi		Kiambu		Machakos		Kajiado	
	Robust	OLS	Robust	OLS	Robust	OLS	Robust	OLS	Robust	OLS
Log of per capita income in a catchment area	0.090 (2.261)	0.082 (1.095)	0.120 (2.907)	0.082 (1.095)	1.022 (4.839)	0.422 (1.436)	0.095 (0.369)	-0.381 (0.953)	0.493 (1.940)	0.520 (2.243)
Log of fees at a health facility	-0.199 (5.610)	-0.377 (4.230)	-0.584 (11.820)	-3.765 (4.230)	-1.402 (30.885)	-0.633 (4.862)	-0.007 (0.412)	0.026 (0.333)	-0.039 (0.119)	-0.088 (0.295)
Cost sharing (1=after; 0=before)	0.208 (3.915)	0.296 (2.145)	0.240 (0.240)	0.296 (2.145)	0.199 (2.417)	0.029 (0.105)	0.143 (1.021)	0.302 (1.395)	0.120 (0.617)	0.126 (0.533)
Number of doctors at a health facility	0.037 (2.563)	0.051 (4.484)	0.044 (6.400)	0.051 (4.484)	0.043 (5.117)	0.074 (0.813)	0.618 (9.090)	0.371 (3.842)	-0.044 (0.226)	-0.065 (0.370)
Log of average household size in a catchment area	-0.018 (1.057)	-0.027 (0.477)	-0.021 (0.679)	-0.269 (0.477)	-0.034 (1.925)	0.127 (1.969)	0.064 (2.264)	0.073 (1.682)	-0.095 (2.285)	-0.087 (2.314)
Proportion of females in a catchment area	2.490 (0.23)	5.060 (3.45)	1.620 (9.92)	5.067 (3.45)	-7.020 (0.20)	-3.887 (0.30)	-2.860 (8.44)	-2.726 (5.20)	-4.230 (-0.138)	8.958 (0.03)
Log of distance between health facilities	-0.115 (1.582)	0.218 (0.987)	-0.056 (-0.459)	0.218 (0.987)	-0.367 (5.697)	0.180 (0.769)	-0.035 (1.412)	-0.048 (1.258)	-0.153 (1.022)	-0.121 (0.884)
Constant	9.683 (28.136)	10.592 (19.223)	10.998 (25.582)	10.592 (13.762)	6.421 (3.946)	8.461 (3.740)	9.411 (5.249)	12.675 (4.570)	6.837 (4.797)	6.689 (5.167)
Sample size	180	50	49	50	44	45	37	37	48	48
R^2		0.782		0.813		0.510		0.851		0.421
F-ratio	112.9 (.000)		108.700 (0.000)		235.040 (0.000)		66.150 (0.000)		(3.39)	

Tables 7.12 through 7.14 show effects of policy changes, especially those that affect quality, in one of the districts (area of intervention) on service utilization in another contiguous district. These effects are shown for various specifications of the demand function. Table 7.12 presents results for the simplest specification. In this specification, the dependent variable is the number of visits in all districts. The coefficient of a district dummy in the specification shows the effect on the total demand of unobservable factors specific to that district relative to factors specific to Nairobi. The first point to note from Table 7.12 is that the effect of user fee on demand is negative (as expected) and that of income is positive, which suggests that medical care is a normal good. As already noted, the comparison in Table 7.12 focuses on total health service utilization as affected by unobserved factors specific to each of the districts, with Nairobi being the comparison district.

Unmeasured factors in Kiambu, i.e., the factors omitted from the regression such as the quality of social infrastructure and level of schooling had the effect of raising demand for health services relative to factors specific to Nairobi. However, as can be seen from the t-ratios of the coefficients for the Kiambu dummy, the effects are not statistically significant. In contrast, factors specific to Machakos and Kajiado, such as the environmental and cultural factors tended to reduce demand for both inpatient and outpatient services relative to unobserved factors in Nairobi; these effects are generally insignificant. However, in overall terms, unobserved district-specific factors do not seem to influence the total up-take of health services by the population.

Table 7.12: Regression Results for Random Effects and OLS Models: Dependent Variable is Log of Total Number of Visits in all Districts (t-ratios in parentheses)

Variables	Log Out-patient Visits		Log Inpatient Visits	
	RE	OLS	RE	OLS
Log of fees at a health facility	-.1485 (5.376)	-.0939 (3.195)	-.1516 (4.199)	-.2284 (4.481)
Log of per capita income in a catchment area	.1249 (4.688)	.1932 (2.235)	.1472 (3.768)	.2084 (2.127)
Kiambu	.0319 (0.076)	.1213 (0.663)	-.3752 (0.824)	.2766 (1.638)
Machakos	-.6413 (1.766)	-.3952 (1.818)	-.4785 (1.062)	.6639 (2.331)
Kajiado	-.6259 (1.659)	-.4279 (1.891)	-.2544 (0.552)	.2242 (1.436)
Nairobi	Coefficients normalised to zero			
Constant	9.667 (26.710)	8.896 (11.174)	9.658 (19.547)	9.677 (27.881)
Sample R^2	339 0.130	339 0.137	180 0.118	180 0.130

Tables 7.13 and 7.14 show how medical care utilization is affected when factors that affect demand change in a contiguous district. The focus is on effects of changes in Nairobi on demand for health services in the districts contiguous to it. In each case, the effect of doctors on demand in contiguous districts is controlled for.

Looking at Table 7.13 (panel B), it can be seen that an increase in the user fees in Nairobi increases demand for outpatient services in Machakos district. This suggests that when cost of medical care in Nairobi rises, people move to Machakos district for health care. The elasticity

of demand for outpatient services in Machakos with respect to fees for outpatient services in Nairobi is .223; that is, a 10% increase in outpatient care in Nairobi increases demand for outpatient services in Machakos by 1.22%. The effects for other districts of price changes in Nairobi are insignificant. The response of outpatient medicare demand in Machakos to Nairobi prices makes sense because of easy transportation between Machakos and Nairobi; Nairobi and which are approximately 40 miles apart are linked by a major road, which is heavily used by buses and Matatus (minibuses).

Table7.13: The effects of Policy Change in Nairobi on the Demand for Medical Care in Contiguous Districts (t-ratios in parentheses)

Variable	Log of outpatient visits			Log of Inpatient Visits		
A. Common Factors	Kiambu	Kajiado	Machakos	Kiambu	Kajiado	Machakos
Log user fees	-.0326 (0.549)	-.4029 (2.921)	-.7092 (6.860)	-.1282 (2.008)	-4.351 (1.681)	-.5835 (3.254)
Log per capita income	.2636 (3.728)	.9535 (2.163)	.4279 (2.847)	1.079 (2.465)	2.549 (0.683)	.6680 (5.333)
Cost sharing (1=after; 0=before)	.0778 (1.015)	-.5083 (1.671)	.0091 (0.054)	.0110 (0.067)	-.7302 (0.384)	.0480 (0.569)
Number of Doctors in Kiambu	**-.0707 (2.983)**			**.0126 (0.215)**		
Number of Doctors in Kajiado		**.0172 (1.673)**			**.2186 (0.979)**	
Number of Doctors in Machakos			**-.0091 (0.560)**			**.0027 (0.063)**
B. Factors specific to Nairobi						
Log user fees in Nairobi	-.0219 (0.379)	.0198 (0.123)	.1223 (3.694)	-.0527 (0.830)	.2375 (0.238)	-.1092 (0.991)
Number of Doctors in Nairobi	.2954 (12.492)	.0330 (1.443)	.0257 (3.315)	-.0167 (0.098)	-.3636 (0.539)	.0216 (0.447)
Log per capita in income in Nairobi	.0280 (0.739)	-.0798 (0.748)	-.0325 (0.584)	.1181 (1.917)	-.0604 (0.192)	.0289 (1.140)
Log distance between facilities in Nairobi	-.0218 (0.185)	-.8821 (2.686)	-.3323 (2.659)	-3.533 (3.323)	-3.823 (3.432)	-.6005 (0.608)
Constant	5.160 (7.261)	3.144 (1.052)	6.671 (5.943)	-1.036 (0.252)	13.201 (0.881)	5.698 (2.491)
Sample size	30	40	44	18	10	18

Table7.14: The effects of Policy Change in Contiguous Districts on the Demand for Medical Care in Nairobi (t-ratios in parentheses)

Variables	Log of outpatient visits			Log of Inpatient Visits		
A Common factors	Nairobi	Nairobi	Nairobi	Nairobi	Nairobi	Nairobi
Log User fee	-.0751 (1.145)	.0565 (1.425)	-.1165 (3.646)	-.0797 (0.895)	-.4562 (4.715)	-.2481 (2.411)
Log per capita income	.0639 (1.637)	.0450 (1.831)	.0955 (1 511)	.0026 (0.041)	.1177 (4.545)	.0646 (4.285)
Cost sharing (=after, =before)	.1724 (2.134)	.0963 (1.883)	.1260 (1.079)	.1144 (0.582)	.2376 (4.209)	.1339 (3 369)
B. District-specific Factors						
Number of Doctor Nairobi	.2535 (11 454)		.0741 (10.180)	-.2121 (1.343)	.0793 (2.036)	.0402 (1 438)
Log user fee Kiambu	.0551 (0.851)			.0244 (0.283)		
Log user fee Kajiado		-.0533 (1.518)			-.0316 (0.184)	
Log user fee Machakos			-.0545 (0.431)			.0548 (0.519)
Number of Doctor Kiambu	-.1358 (6.105)			.0397 (0.509)		
Number of Doctor Kajiado		-.0084 (3.196)			.0220 (0.937)	
Number of Doctor Machakos			.0739 (3.967)			.0293 (1.221)
Log per capita income Kiambu	.0284 (0.414)			.0125 (0.021)		
Log per capita income Kajiado		-.0030 (0.034)			-.1110 (1.740)	
Log per capita income Machakos			-.2568 (1.831)			-.0376 (0.734)
Log distance in Kiambu	.0973 (0.751)			-.0555 (0.212)		
Log distance in Kajiado		.1360 (6.097)			.2033 (1.140)	
Log distance in Machakos			.0359 (0.954)			.0119 (0.078)
Constant	8.0310 (10.201)	9.605 (13.741)	10.835 (8.966)	13.263 (2.928)	10.113 (8.459)	10.634 (8.710)
Sample size	30	40	44	18	10	18
R^2	0.955	0.951	0.839	0.877	0.871	0.985

Estimation method is OLS.

In Table 7.14 the simulation exercise is reversed. We examine what happens in Nairobi's health facilities when changes occur in contiguous districts.

From Table 7.14 (Panel B), it can be seen that an increase in user fees in the contiguous

icts (Kiambu, Kajiado and Machakos) reduces the demand for outpatient services in obi; however, this price effect is not statistically significant. In the case of doctors, an ease in doctors in Kiambu and Kajiado reduces utilization of outpatient services in robi. This makes sense because, with better quality of care in the two districts (which can proxied by doctors) patients do not have to travel to Nairobi for better care. That is, when re improves in home areas, patients either stay in the home districts or they shift from irobi back to their original sources of care. In the case of Machakos, an increase in doctors ere raises the demand for outpatient services in Nairobi. This is possibly because the ctors own clinics in both areas and this may cause provider induced increase in service ilization through referrals by doctors to their own clinics.

An increase in incomes in Machakos and Kajiado districts reduces demand for outpatient care in Nairobi. This may be due to the seeking of more expensive care in home districts by patients instead of seeking subsidised or cheaper care in Nairobi. The effects of other changes in contiguous districts on service utilization in Nairobi are interpreted similarly.

In the case of inpatients, an increase in user fees in Kiambu, Kajiado and Machakos would increase demand for inpatient services in Nairobi. The effects of increase in doctors in the three districts on inpatient demand in Nairobi is mixed and statistically insignificant i.e., the effect is sometimes positive and other times negative. The effects of the increase in income in contiguous districts on inpatient service utilization in Nairobi is also mixed and statistically insignificant.

To conclude, it is very important to consider spillover effects of policy changes in one district on other districts, especially those that are contiguous to it. Failure to do so could lead to under (over) prediction of service demands and hence to inefficiencies in the allocation of

health personnel and other medical supplies in districts. Other previous studies failed to consider this important aspect of policy change or implementation.

In the last Table in this section (Table 7.15) we consider the effect of quality-related variables on demand for outpatient and inpatient services. The reason why quality indicators have been entered individually in various regression equations is because these regressors are highly collinear so that multicollinearity would be a problem in estimation of models if the regressors were all included in the estimating equations.

ratios in parentheses)

Variables	Log Outpatient Visits (RE Parameter Estimates)																	
	1	2	3	4	5	6	7	8	9	1	2	3	4	5	6	7	8	9
A. Common Factors																		
Log of per capita income in a catchment area	.0843 (3.095)	.0849 (3.120)	.0849 (3.106)	.0874 (3.202)	.0869 (3.186)	.0860 (3.138)	.0860 (3.122)	.0843 (3.076)	.0844 (3.077)	.0909 (2.320)	.0909 (2.319)	0953 (2.392)	.0987 2.483)	0959 (2.441)	0996 (2.581)	.0997 (2.462)	0907 (2.331)	.0858 (2.209)
Log of fees at a health facility	-.1827 (6.571)	-.1895 (6.821)	-.1860 (6.673)	-.1842 (6.650)	-.1866 (6.712)	-.1887 (6.709)	-.1821 (6.527)	-.1845 (6.600)	-.1832 (6.549)	-.1849 (5.283)	-.1904 (5.439)	-.1949 (5.473)	-.1908 (5.402)	-.1896 (5.410)	-.1878 (5.511)	-.1817 (5.111)	-.1945 (5.630)	-.1856 (5.399)
Cost sharing (1=after; 0=before)	.1615 (4.049)	.1627 (4.086)	.1598 (3.990)	.1610 (4.033)	.1590 (3.983)	.1614 (4.024)	.1610 (4.000)	.1626 (4.050)	.1623 (4.042)	.2151 (4.040)	.2176 (4.083)	.2166 (4.008)	.2168 (4.041)	.2133 (4.000)	.2247 (4.295)	.2210 (4.036)	.2292 (4.332)	.2362 (4.466)
Log of distance between facilities	-.1356 (2.092)	-.1406 (2.215)	-.1378 (2.151)	-.1309 (2.063)	-.1378 (0.0639)	-.1300 (2.044)	-.1290 (2.021)	-.1310 (2.048)	-.1323 (2.056)	-.1278 (1.571)	-.1162 (1.479)	-.1026 (1.340)	-.1151 (1.462)	-.1252 (1.577)	-.0984 (1.357)	-.0748 (1.022)	-.1022 (1.377)	-.0907 (1.224)
Kiambu	.0562 (0.131)	.1617 (0.400)	.1075 (0.262)	.1020 (0.254)	.0720 (0.176)	.1909 (0.467)	.1148 (0.281)	.1181 (0.287)	.0801 (0.193)	-.4507 (0.984)	-.1730 (0.396)	-.2559 (0.643)	-.2588 (0.601)	-.3925 (0.019)	.4415 (1.063)	-.0754 (0.195)	.0502 (0.127)	.0403 (0.102)
Machakos	-.6255 (1.657)	-.3855 (1.053)	-.5081 (1.383)	-.5531 (1.555)	-.5372 (1.480)	-.4742 (1.299)	-.5598 (1.537)	.5591 (1.537)	.5951 (1.613)	-.5302 (1.133)	-.0225 (0.045)	-.1841 (0.412)	-.2531 (0.543)	-.3287 (0.724)	.6108 (1.303)	-.1357 (0.324)	.1028 (0.238)	.1303 (0.301)
Kajiado	-.5387 (1.348)	-.3329 (0.867)	-.4626 (1.201)	-.4874 (1.296)	-.4686 (1.222)	-.3870 (1.002)	-.4815 (1.254)	-.4741 (1.231)	-.5115 (1.311)	-.4068 (0.878)	.1221 (0.804)	-.0240 (0.055)	-.1121 (0.245)	-.1900 (0.425)	.7749 (1.688)	.0517 (0.127)	.2483 (0.592)	.2871 (0.679)
B. Quality Variables																		
Log of Number of nurses		**.0039 (2.658)**									**.0037 (2.142)**							
Log of Number of doctors			**.2310 (1.750)**									**.0328 (2.049)**						
Log of Number of pharmacists				**.02316 (2.367)**									**.0414 (1.673)**					
Log of Number of clinical officers					**.0193 (2.101)**									**.0200 (1.893)**				
Log of Number of patient attendants						**.0291 (1.743)**									**.0840 (4.293)**			
Log of Number of cleaners							**.0050 (0.895)**									**.0156 (2.455)**		
Log of Number of xray machines								**.0396 (1.208)**									**.1371 (3.637)**	
Log of Number of theatres									**.0265 (0.589)**									**.2088 (3.724)**
Constant	9.934 (27.165)	9.638 (26.103)	9.787 (26.728)	9.826 (27.641)	9.791 (27.020)	9.718 (26.010)	9.840 (26.686)	9.838 (26.991)	9.889 (26.972)	10.119 (20.503)	9.597 (17.921)	9.726 (19.208)	9.783 (18.869)	9.871 (19.844)	8.841 (16.454)	9.579 (18.772)	9.468 (19.389)	9.427 (19.221)
Sample size R^2	339 0.101	339 0.244	41 0.167	339 0.165	339 0.197	339 0.194	339 0.138	339 0.160	339 0.119	180 0.044	180 0.201	180 0.316	180 0.215	180 0.203	180 0.421	180 0.375	180 0.343	180 0.362

From Table 7.15 (Panel B), we see that an increase in doctors generally raises demand for outpatient and inpatient services. The same is true for pharmacists, clinical officers, nurses and cleaners. However, the effects of these personnel are not the same for outpatient and inpatient services. In the case of cleaners, this category of personnel has a greater impact on demand for inpatient care than outpatient services.

Turning attention to medical equipment, we see that x-ray machines and theatres are positively correlated with outpatient and inpatient services, but the correlations are much stronger in the case of inpatient care, as one would expect. The table clearly indicates that quality is a major factor in health service utilization.

Looking at the table as a whole, it can be seen that all the previous results hold. For example, the user fees elasticities of demand are consistently negative and less than unity in all specifications; and are also statistically insignificant. The same applies with respect to income elasticities of demand, which are uniformly positive and less than unity, in all specifications, as well as statistically significant. The higher rate of service utilization during the period of cost sharing (relative to the before period) is also strongly confirmed in all the specifications. i.e. the coefficient on the cost-sharing dummy is positive and significant in virtually every case. However, as previously noted, the increase in fees due to factors associated with cost-sharing was not large enough to offset the negative effect induced by higher user fees. To compare these effects, one must weight the coefficient on the cost-sharing dummy with the sample mean of the dummy to transform it into an elasticity. Such a transformation shows the

negative (elasticity) coefficient on fees is uniformly higher than the (elasticity) coefficient on the dummy for the cost sharing period.

Briefly, our results have shown that medical care price is central in determining the utilization of health services, although the size of its effect is small. Both the descriptive and regression results have confirmed the a priori expectation of a negative effective effect of user fees on the demand for health services. In all the regression results, the demand for health services is less responsive to changes in fees than to changes in income (Appendix Table 7.1). Furthermore the welfare effects of fees can be assessed directly from empirical results presented in Tables 7.1 – 7.15. As is evident from the welfare function in the chapter 5 (and equation 1) welfare drops as the utilisation of health services falls. Thus, other things being constant, the factors that affect health services utilisation, also do affect the welfare of the population.

The contiguity of regions to each other has come out very clearly as an important determinant of health service use. The effect of policy change for example in Nairobi has large spillover effects on contiguous districts. These spillover effects are important to measure so as to correctly predict the changes in demand that can result from changes in policy in different regions of the country. These findings and their implications for policy decisions and implementation of cost-sharing programs are discussed in greater detail in chapter 8.

CHAPTER 8

SUMMARY AND CONCLUSION

8.1 Summary and key findings

This study has empirically examined the implementation of health care financing reforms in Kenya using cross-section and time series data. The health financing reforms were instituted to change and reduce heavy reliance on the government as the main financier of heath care, and to develop additional mechanisms for health financing in the public sector. This study concentrated on demand effects of the introduction of the cost sharing in government health facilities, as well as in non-government facilities. Nominal charges for inpatient care had persisted and were only weakly enforced in Kenya since independence but, in 1989 the Ministry of Health increased these charges substantially and broadened them to cover outpatient services except at the dispensary level. In revising and introducing user fees, the Ministry of Health recognised that a number of parallel objectives were necessary to its success, namely, generation of additional revenue, assurance of service access by the poor and improvement in quality of services at all levels of the public health care system.

A number of empirical studies (Kirigia *et al*, 1989; REACH 1988a, 1988b) were done to inform the design and implementation of these reforms. Even so, uncertainty and concerns regarding the effects of the reforms remained in the minds of policy makers and individuals. This was due in part to the dearth of information and lack of conclusive and illuminating studies regarding the welfare effects of health care pricing policies. Most earlier studies (except Dow, 1995)

concentrated on the effects of pricing on only the sick, thus producing results that appeared to support the introduction of user fees based on low price elasticities of demand. The first stream of these studies reported very low elasticities of demand for curative care (see e.g., Akin *et al*, 1986; Kirigia *et al*, 1989), which suggested that user charges could be levied at government health facilities with little impact on attendance. The second stream of studies reported high and statistically significant price elasticities of demand for curative care especially among the low income people (see Gertler and van der Gaag, 1990; Mwabu et al., 1993; Mwabu and Wang'ombe, 1997). The third stream showed that reductions in demand would be averted if user fee revenues are used to improve quality of services. These studies had two shortcomings in common. Firstly, they relied on consumer-reported costs of care rather than on exogenously given prices of medical care to estimate price elasticities. Secondly, except for Mwabu and Wang'ombe (1997), only cross-section data based on household surveys were used for econometric analysis. In addition, the effects of quality of services on service demand were controlled for only imperfectly in econometric analysis. For these reasons, demand estimates in previous studies are likely to have been biased.

The conceptual basis for this study is an abbreviated welfare function (Fields, 1998) in which health services and non-health services are its arguments. In this general welfare function, other welfare determinants, apart from health services are assumed to be given. In other words, estimates of demand for health services were derived by holding the consumption of other goods and services constant. The study used a panel data method to estimate a random effects model for health services. The data needed for estimation was collected on service utilization and on factors that affect this utilization. The health facility in a catchment area formed the unit of analysis. Data were collected on the number of visits to the facility in the selected catchment area and on

factors in that catchment area that affect attendance to the facility. The study thus focused on understanding the determinants of demand based on factors specific to a facility and to a catchment area. In addition, the study captured the behaviour of households seeking health care from facilities that were in competition with the facility under observation in a specific catchment area.

The data set was derived from records of a sample of government and non-government health facilities, covering all levels, namely, hospitals, health centres and dispensaries in a catchment area. The facilities covered by the study were selected from an urban district, purposively selected and from three rural districts contiguous to the urban district. The urban district was Nairobi, and the rural districts were Kiambu, Kajiado and Machakos, all of which are contiguous to Nairobi.

The rural districts were required to be contiguous to Nairobi in order to facilitate examination of changes in health service utilization in a primate urban area on the adjacent areas and the vice-versa. Also, the contiguity of rural study districts to an urban centre intended to allow for examination of the effect of urban-rural disparity in service quality on the utilization of urban services by both urban and rural populations. Furthermore, the contiguity feature of the study sites ensures that both rural and urban populations have information about quality of services in the adjacent and accessible areas.

As in previous other studies (see e.g., Mwabu (1986), Akin *et al* (1986b), determinants of demand are those specific to a facility and to a catchment area. However, in contrast to these earlier studies, the focus in this thesis is on factors that influence demand both over time and in a

cross-section of households and health facilities. In terms of demand determinants, the present and previous approaches have a common feature in that they seek information from a health facility. The approach used in this thesis is distinctly unique in that it enables an examination of utilization of services at a given facility at different points in time and at a relatively low cost to a researcher. This is in contrast to panel data obtained from households, which are very expensive because household surveys have to be repeated, an exercise that often involves tracing previously sampled households at great expense.

It is need less to say, that the panel data generated through the present approach, that collects both cross-section and time series data from facility records and secondary sources is cheaper than the panel data collected from a cross-section of households at certain time intervals. In addition to this approach being cost-effective, it generates sufficiently exogenous information on demand determinants. For example, income is the average income for the catchment area rather than the income reported by households, as in a household survey; further, the price is the user fee charged by a health facility rather than the fee reported by households.

The results confirm *a priori* expectation of a reduction in utilization of health care services following user fees. The descriptive statistics reveal that there was an overall reduction in service utilization in all the sample districts. Furthermore, the statistics show that the reduction in service utilization was larger in government than in non-government facilities. The reduction in service utilization however appears to be due also to factors other than the user fees. In particular, there was a drop in real per capita income during the cost-sharing period, which undoubtedly contributed to the drop in health service utilization. The reduction in service utilization was

largest in government dispensaries, followed by government hospitals and by health centres, in all districts; the utilization was lowest in Nairobi district.

Further statistical analysis shows that while higher fees had a negative impact on utilization of health services, the introduction of cost sharing is associated with outward shifts in health services demand, which means higher health service utilization at given prices. The results suggest that improvements in quality of services after the introduction of cost sharing increased the use of health services during the period 1989-1995 (the cost sharing period). This is evidenced by a positive coefficient on the cost-sharing dummy, which turns on during the cost sharing period. Collins *et al.* (1996) report that there was some improvements in during the cost sharing period. Availability of drugs was cited as the main reason for the service improvement. The results obtained in this study are consistent with the Collins *et al* finding. The availability of doctors, x-ray machines, theatres, and support staff are all associated with increased utilization of health services. This finding reinforces the need to allow retention and expenditure of cost sharing revenue at the local health facilities (i.e. where fees are being collected).

Despite the increase in utilization due to possible effect of quality improvements, the net effect of cost sharing implementation was negative, however, since the increase in utilization was not high enough to counteract the effect of higher fees. This finding indicates the need for policy and program managers to exercise caution when introducing fees since they can lead to a large drop in utilization, especially among poor households, which also tend to have large families.

With respect to distance between health facilities, the results have shown that closeness or high density of health facilities in a catchment area increases the rate of utilization of services,

perhaps because they tend to share staff and treatment technologies. Such sharing of staff and technology may increase service quality and therefore the demand for medical care. However, the distance elasticity of demand is small which implies that the clustering of health facilities would have to be very dense for it to induce a sizeable increase in health service utilization.

The study has analysed the area contiguity effect on demand, and has convincingly shown that fee and policy changes in one area can have large spill-over consequences in adjacent areas. For example, changes in per capita income or service quality in a district does influence the up-take of health services in a contiguous district. Health policy changes in Nairobi for example would affect utilization of services in the contiguous districts such as Kiambu, Machakos and Kajiado. In addition to the factors explicitly included in the regressions, the study shows that unmeasured factors, such as social infrastructure, level of schooling, environmental and cultural factors have large effects on demand for health services in the specific study districts, but their demand effects in other districts have no statistical significance, which suggests that their impact on health service utilization is not uniform in all areas.

8.2 Policy Implications

The cost sharing policy was introduced as part of the long term measures to address the financing and development of the Kenyan health sector. Regarding the financial position of the sector, cost sharing through user fees was meant to raise additional revenue and to translate it into more accessible and better health services. In this regard, a deliberate decision was taken to allow retention and expenditure of revenues at the fee collecting facilities. In addition, continued access by the needy and poor was to be guaranteed by differential pricing across levels of facilities in the health sector, and across service types; government dispensaries for example were exempted

n fees. In summary, the policy was aimed at improving the efficiency of service delivery and ity in its utilization.

is study has shown that cost-sharing as a policy can be used to achieve redistribution of users ross different providers and regions, and therefore induce a balanced growth in the health ctor. Taking into account the fact of contiguity of regions to each other, the analysis has shown at charging for health services in one location can lead to a large redistribution of users of ealth services across providers in neighbouring districts. The extent of redistribution has also een shown to depend on the prices and quality of services provided in contiguous areas. That by troducing user fees in one location, use of health services can be increased in contiguous istricts is not surprising finding. The surprise is that these spill-over effects had not been analysed in previous studies. This is important because ignoring to pay attention to the availability and quality of services in adjacent areas can lead to over burdening of health resources and capacities in areas that receive unexpected patients or to under-utilization of medical facilities in regions from which patients move.

Proximity between medical facilities has been shown to induce an increased utilization of services since it enables users to get more information regarding the availability and quality of services provided across facilities. Considering the revenue mobilisation objective of cost sharing, it seems that areas such as urban centres that are well endowed with health facilities have higher potential of generating more revenues than under-served rural locations, where medical facilities are far apart. This finding implies that facilities in rural locations will require special budgetary allocations from the Treasury to compensate them for their low revenues if they have to raise quality of services to the expected standards. In terms of equity, the finding regarding distance shows that there will continue to be differential access to quality services

between rural and urban populations, with urban residents having better access to quality health services. Indeed, as the government intensifies the process of decentralisation of health services management, the need for equalisation or compensation grants to poorer and under-served areas will need to be given special attention. It should be noted that the advantage of the urban residents does not lie in them being closer to a health facility relative to the rural population. Rather, their advantage is in being closer to a cluster of health facilities that can share medical staff, equipment, and state-of-the art treatment technologies.

A further implication of this study is the need to develop alternative financing mechanisms, such as insurance or pre-payment schemes. The study findings indicate consistently that price has a negative and statistically significant effect on the utilization of health services. Insurance and pre-payment schemes, in addition to the existing National Hospital Insurance Fund (NHIF), if developed, will counteract the effect of fees on use of services, and in addition improve the revenue generation potential of the user fee programme of the Ministry of Health.

8.3 Areas for further Research

Four distinct areas for research stand out from the findings and conclusions of this study. Firstly, we have concluded on the basis of the results that there was an increased utilization of health services attributable to the effect of clustering of health facilities. In particular, we have concluded that a high density of facilities promotes sharing of staff, treatment technologies and equipment which translate into improved quality of care. This appears as a possible explanation for the increased utilization of clustered facilities. More data and analysis is required to determine the magnitude of this clustering effect.

dly, the contiguity effect has been analysed in this study with respect to a primate urban nd it has been shown that it affects the behaviour and utilization of health services in the ent districts. Similar analyses for a rural setting will be informative and further inate the contiguity factor. There is need to conduct a similar study in another African try to verify some of the key findings of this study, especially the effect of the facility tering on demand.

rdly, research is needed to determine the mechanisms for compensating rural populations ause they are served by dispersed facilities and therefore do not have the advantage of oying better quality services. This will be useful in addressing some of the equity concerns health care delivery.

estly, further analysis is required to use the panel data method to verify the extent to which emand for health services is inelastic with respect to prices and income as has been demonstrated in this study.

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APPENDICES

Appendix 1 - Tables

Table 1

Regression Results for Random Effects: Dependent Variable is Log of the Number of Visits (t in parentheses)

Variable	Log Inpatient Visits (RE)	Log Outpatient Visits (RE)
Log of income	.1067 (1.573)	.8510 (3.116)
Log of fees	-.3037 (6.436)	.1849 (6.653)
Cost sharing (1=after; 0=before)	.2393 (2.646)	.1461 (3.656)
Log of distance	.0016 (0.045)	-.1669 (2.763)
Kiambu	.0951 (0.045)	-.0707 (2.983)
Masaku	.2978 (0.929)	-.0091 (0.500)
Kajiado	.7411 (2.409)	.0172 (1.673)
Log of number of pharmacists	-.1048 (1.536)	.0231 (.0151)
Log of average household size	-.0769 (4.241)	.0586 (0912)
Annual rainfall	.0002 (1.505)	3.061 (0.306)
Proportion of females in the catchment area	-2.65 (0.145)	-3.060 (0.306)
Log of number of Lab technicians	-.1113 (3.245	.0907 (-2.692)
Log of number of beds	.0023 (2.541)	-.0306 (3.425)
Log of number of chemical types	.0650 (3.745)	.0775 (4.287)
Log of number of surgical equipment	-.0393 (2.928)	.0469 (-3.383)
Average annual temperatures	.0302 (0.265	.0884 (0.919)
Average literacy rate	-5.12 (1.163)	-6.930 (-1.532)
Log of number of clinical officers	-.0079 (0.263)	0.193 (2.101)
Log of number of support staff	.0149 (0.489)	.0118 (.369)
Log of Price of food	.1251 (1.478)	.1523 (1.587)
Log of number of doctors	.1267 (2.865)	.2310 (1.750)
Constant	9.341 (16.454)	9.887 (19.644)
Sample size	180	323
R^2	0.681	0.936

dix Table 2- Overall Average Annual Service Utilization by District and Type of ment and non-government Facility (Standard deviations in parentheses)

of Facility	Average Annual Service Utilization		Percentage Change
	Before Cost Sharing	After Cost Sharing	
irobi District			
Facilities	3955.54 (4388.17)	1971.07 (2252.73)	-50.16
als			
Centres	7233.78 (4414.12)	3480.43 (2145.08)	-51.88
nsaries	2559.51 (2711.74)	1250.13 (1818.55)	-51.16
GOK Facilities	14965.42 (1817.63)	1629.56 (28405.9)	8.51
itals	38640.6 (15,354.22)	18785.01 (7430.23)	-51.3
lth Centres	2755.67 (3053.91)	1382.05 (1514.85)	-49.84
nsaries	7569.93 (5781.09)	6986.10 (2687.56)	-7.71
all District	8960.03 (13720.88)	8456.74 (20431.69	-5.61
Kiambu District			
Facilities	9857.37 (15005.56)	10089.78 (1255.83)	2.35
itals	49723.23 (5940.80)	26123.3 (345.64)	-47.46
lth Centres	12930.61 (13277.66)	17586.24 (12935.98)	36.00
nsaries	2046.35 (1823.53)	1034.68 (956.34)	-49.43
n-GOK Facilities	10331.47 (1172.29)	5800.92 (572.01)	-43.85
pitals	27317.17 (11377.30)	12754.17 (4613.05)	-53.31
lth Centres	10671.80 (9149.91)	6379.47 (5334.49)	-40.22
nsaries	1328.14 (1733.77)	1456.45 (1332.94)	9.66
rall District	10076.19 (13505.95)	8110.31 (10202.16)	-19.51
Machakos District			
OK Facilities	12063.16 (12303.25)	4225.64 (7169.94)	-64.97
spitals	34938.72 (3484.5)	22917.49 (7499.66)	-34.40
lth Centres	9029.5 (3251.55)	2745.33 (1254.88)	-69.59
nsaries	9377.89 (13578.64)	1033 (741.67)	-88.98
n-GOK Facilities	5302.93 (7561.53)	3291.67 (3559.73)	-37.92
spitals	Missing	4576 (313.66)	Missing
lth Centres	11880.96 (11146.93)	6268.06 (4678.26)	-47.24
nsaries	2897.74 (2251.37)	1589.41 (1192.78)	-45.15
rall District	8505.15 (10558.66)	3734.08 (5566.79)	-56.09
D. Kajiado District			
GOK Facility	4538.56 (7529.95)	2289.38 (3691.50)	-49.55
spitals	23210.22 (1385.50)	10952.76 (427.43	-52.81
lth Centres	6572.64 (8034.54)	3390.23 (4095.79)	-48.41
nsaries	944.54 (632.79)	518.43 (355.35)	-45.11
Non-GOK Facility	4320.39 (5153.4)	4113.87 (3547.28)	-4.78
spitals	6136.17 (6761.63)	6103.37 (2990.80)	-0.534
lth Centres	8159.33 (5110.18)	6246.31 (3363.13)	-23.44
nsaries	1290.71 (1743.47)	2038.61 (2567.34)	57.94
rall District	4447.65 (6603.15)	3049.58 (3732.04)	-31.43

Source: Own computation based on survey data

(Appendix Table 3.a)

DISTRIBUTION OF SAMPLE [illegible] IN NAIROBI DISTRICT

FACILITY TYPE	GOVERNMENT FACILITIES IN SAMPLE		NGO / MISSION / PRIVATE FACILITIES IN SAMPLE	
HOSPITAL	1 Mbagathi District Hospital	(Kibera)	1 Mater Misericordiae Hospital	(Industrial Area)
	2 Kenyatta National Hospital	(Nairobi)	2 Nairobi Hospital	(Nairobi)
			3 Aga Khan Hospital	(Parklands)
HEALTH CENTRE / NURSING HOME	1 G.S.U. Kibera H/C	(Langata)	1 Chandaria M.H.I.V. H/C	(Dagoretti)
	2 Kamiti H/C	(Kamiti)	2 Mundoro Medical Clinic	(Nairobi)
	3 Kayole H/C	(Embakasi)	3 Ideal Nursing Home	(Mathare)
	4 Lady North H/C	(Westlands)	4 Nairobi West Nursing Home	(Langata)
	5 Lang'ata H/C	(Lang'ata)	5 South "B" Nursing Home	(South "B")
DISPENSARY / HEALTH CLINIC	1 G.K. W Prison Dispensary	(Langata)	1 Kibera Catholic Dispensary	(Kibera)
	2 Kabete Juvenile Remand Home Disp.	(Kabete)	2 Nairobi Evang. Graduate Dispensary	(Nairobi)
	3 Mathare Police Line Dispensary	(Mathare)	3 Shauri Moyo (SDA) Dispensary	(Kamukunji)
	4 Mbagathi Training School Disp.	(Langata)	4 Dr. Aggarwal Prakash Dispensary	(Parklands)
	5 Railway Training School Disp.	(Embakasi)	5 Dr. R. Kamau Dispensary	(Nairobi)
TOTALS	**12**		**13**	

(Appendix Table 3 b)

DISTRIBUTION OF SAMPLED HEALTH CARE FACILITIES IN KAJIADO DISTRICT

FACILITY TYPE	GOVERNMENT FACILITIES IN SAMPLE			NGO / MISSION / PRIVATE FACILITIES IN SAMPLE		
HOSPITAL	1	Kajiado District Hospital	(Central)	1	Magadi Hospital	(Magadi)
				2	Ngong Hills Hospital	(Ngong)
HEALTH CENTRE / NURSING HOME	1	Enkorika H/C	(Mashuru)	1	Abossi H/C	(Ngong)
	2	Ngong H/C	(Ngong)	2	Fatima (Ongata) Mission H/C	(Ngong)
	3	Ongata Rongai H/C	(Ngong)	3	Rombo Mission H/C	(Rombo)
	4	Kimana Dispensary	(Loitokitok)	4	Matasia Maternity Home	(Ngong)
	5	Namanga H/C	(Mile 46)	7	Rongai Cottage Nursing Home	(Ngong)
DISPENSARY / HEALTH CLINIC	1	Ilkelunyeti Dispensary	(Mashuru)	1	Fatima (Lengesim) Dispensary	(Loitokitok)
	2	Iltilal Dispensary	(Loitokitok)	2	Orinie Dispensary	(Central)
	3	Namelock Dispensary	(Loitokitok)	3	Emmanuel Health Clinic	(Ngong)
	4	Ngataek Dispensary	(Central)	4	Junel Medical Clinic	(Ngong)
	5	Olgulului Dispensary	(Loitokitok)	5	Midhill Medical Clinic	(Central)
TOTALS	**11**			**12**		

(Appendix Table 3 c)

DISTRIBUTION OF SAMPLED HEALTH CARE FACILITIES IN MACHAKOS DISTRICT

FACILITY TYPE	GOVERNMENT FACILITIES IN SAMPLE			NGO / MISSION / PRIVATE FACILITIES IN SAMPLE		
HOSPITAL	1	Machakos District Hospital	(Central)	1	Bethany Hospital	(Central)
				2	Franciscan Convent Hospital	(Central)
HEALTH CENTRE / NURSING HOME	1	Katangi H/C	(Yatta)	1	Kansalu (Misyani) Mission H/C	(Machakos)
	2	Mitaboni H/C	(Kathiani)	2	Dr. Onyango's Nursing Home	(Machakos)
	3	Muthetheni H/C	(Mwala)	3	Machakos Nursing Home	(Central)
	4	Sulmac H/C	(Mwala)	4		
	5	Thinu H/C	(Kathiani)	5		
DISPENSARY / HEALTH CLINIC	1	Kaani Dispensary	(Central)	1	Kabaa Mission Dispensary	(Mwala)
	2	Kivaa Dispensary	(Masinga)	2	Ndithini Mission Dispensary	(Masinga)
	3	Matungulu Dispensary	(Kangundo)	3	Kibwezi Dispensary	(Kibwezi)
	4	Muthesya Dispensary	(Kathiani)	4	Kinyui Dispensary	(Masinga)
	5	Ndalani Dispensary	(Yatta)	5	Kyanzave Dispensary	(kibwezi)
TOTALS	**11**			**10**		

(Appendix Table 3 d)

DISTRIBUTION OF SAMPLED HEALTH CARE FACILITIES IN KIAMBU/THIKA DISTRICT

FACILITY TYPE	GOVERNMENT FACILITIES IN SAMPLE			NGO / MISSION / PRIVATE FACILITIES IN SAMPLE		
HOSPITAL	1	Kiambu District Hospital	(Kiambaa)	1	Kikuyu (PCEA) Hospital	(Kikuyu)
				2	Central Memorial Hospital	(Thika)
HEALTH CENTRE / NURSING HOME	1	Gakoe H/C	(Gatundu)	1	Kalimoni H/C	(Ruiru)
	2	Kagaa H/C	(Githunguri)	2	Kibubuti H/C	(Kiambaa)
	3	Lari H/C	(Lari)	3	Kiriita Mission H/C	(Lari)
	4	Lusigeti H/C	(Kikuyu)	4	Chania Maternity & Nursing Home	(Thika)
	5	Wangige H/C	(Kikuyu)	5	Kikuyu Nursing Home	(Kikuyu)
DISPENSARY / HEALTH CLINIC	1	Gaciika Dispensary	(Gatundu)	1	Gatitu Dispensary	(Kiambu)
	2	Gathanga H/C	(Gathanga)	2	Lioki Mission Dispensary	(Lioki)
	3	Gichuru Dispensary	(Kikuyu)	3	Thigio Mission Dispensary	(Kikuyu)
	4	Kagaa Dispensary	(Githunguri)	4	Limuru Nursing Home	(Limuru)
	5	Mataara Dispensary	(Gatundu)	5	Riuki Dispensary	(Limuru)
TOTALS	**11**			**12**		

Figure 1 – Map of Kenya with an inset of the study areas

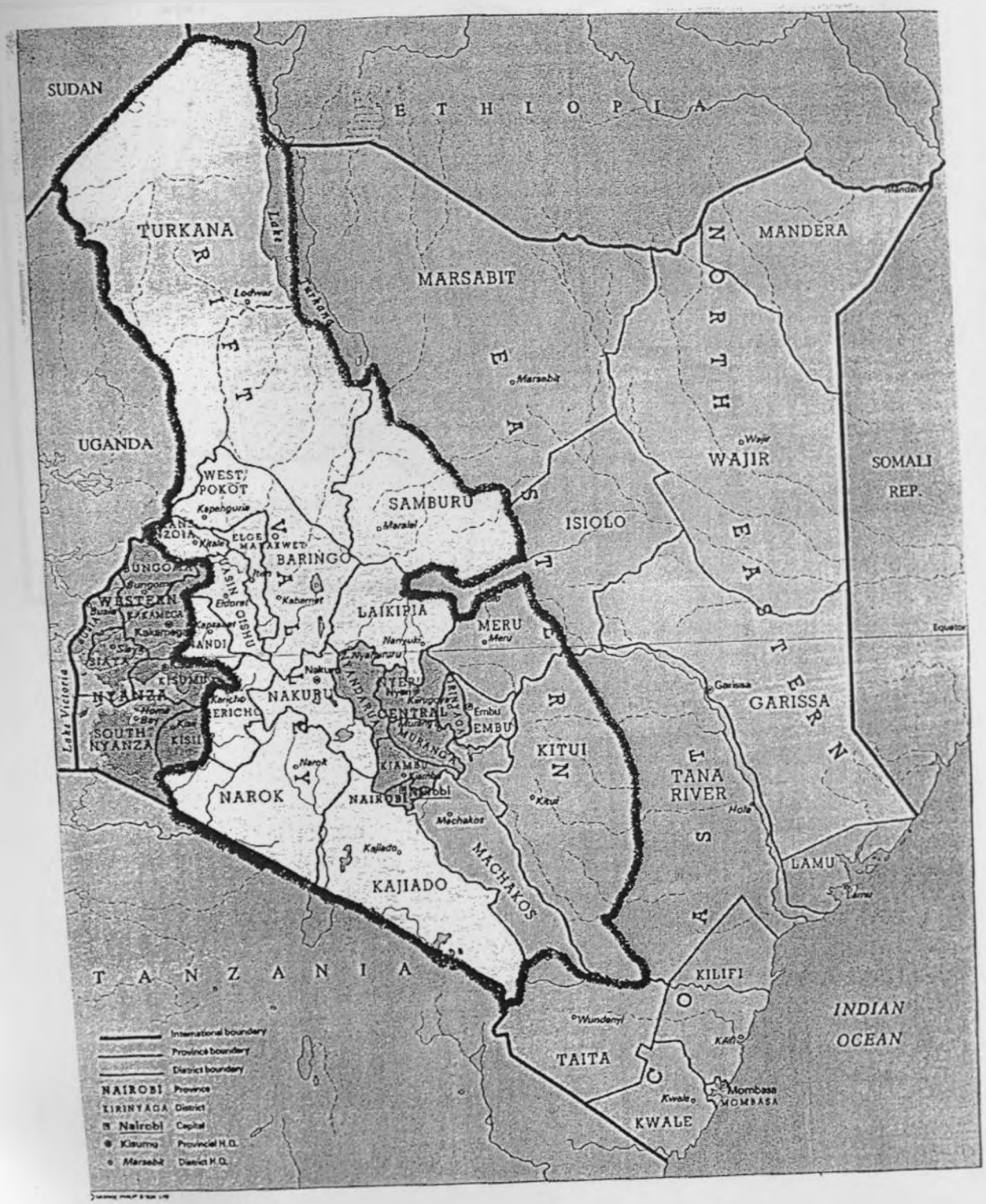


Figure 2 – Nairobi District: Health Facilities

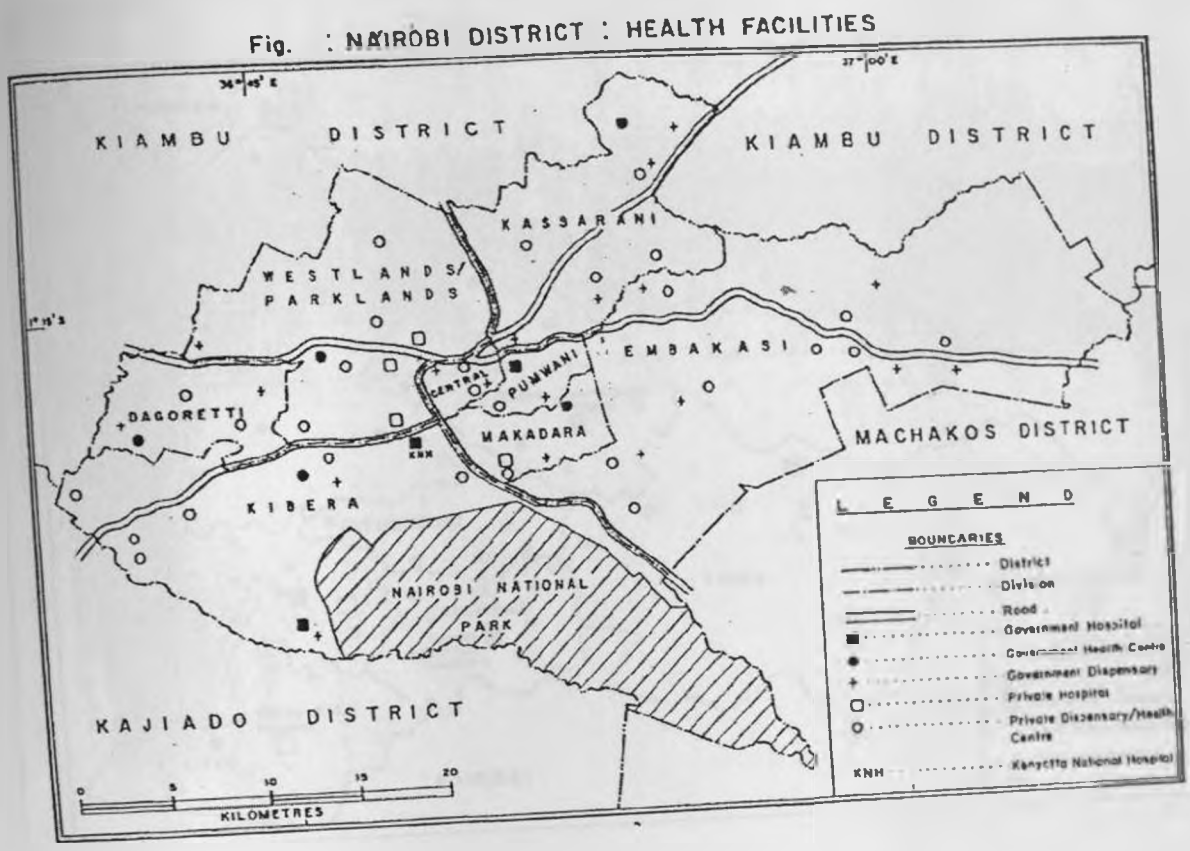


Figure 3 – Kiambu District: Health Facilities

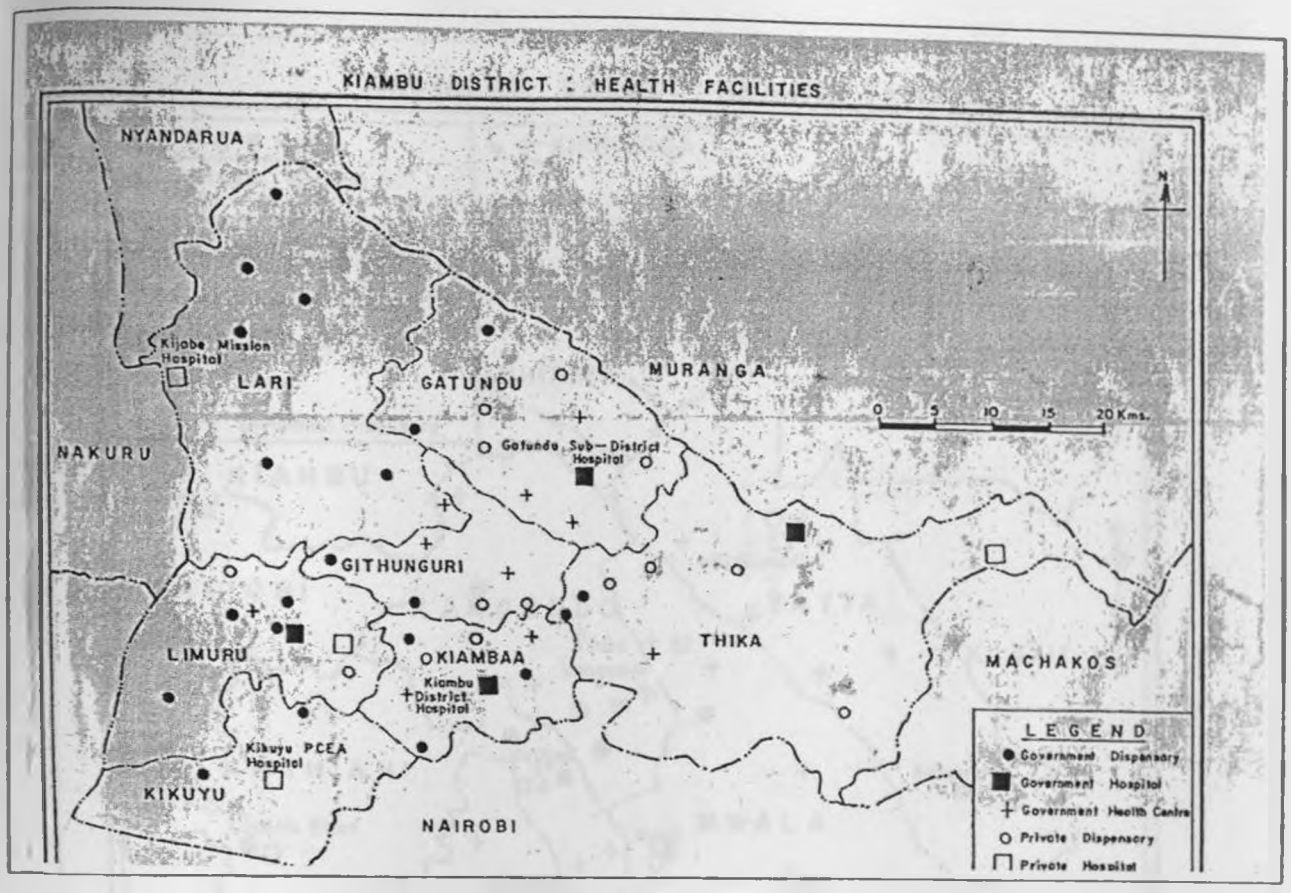
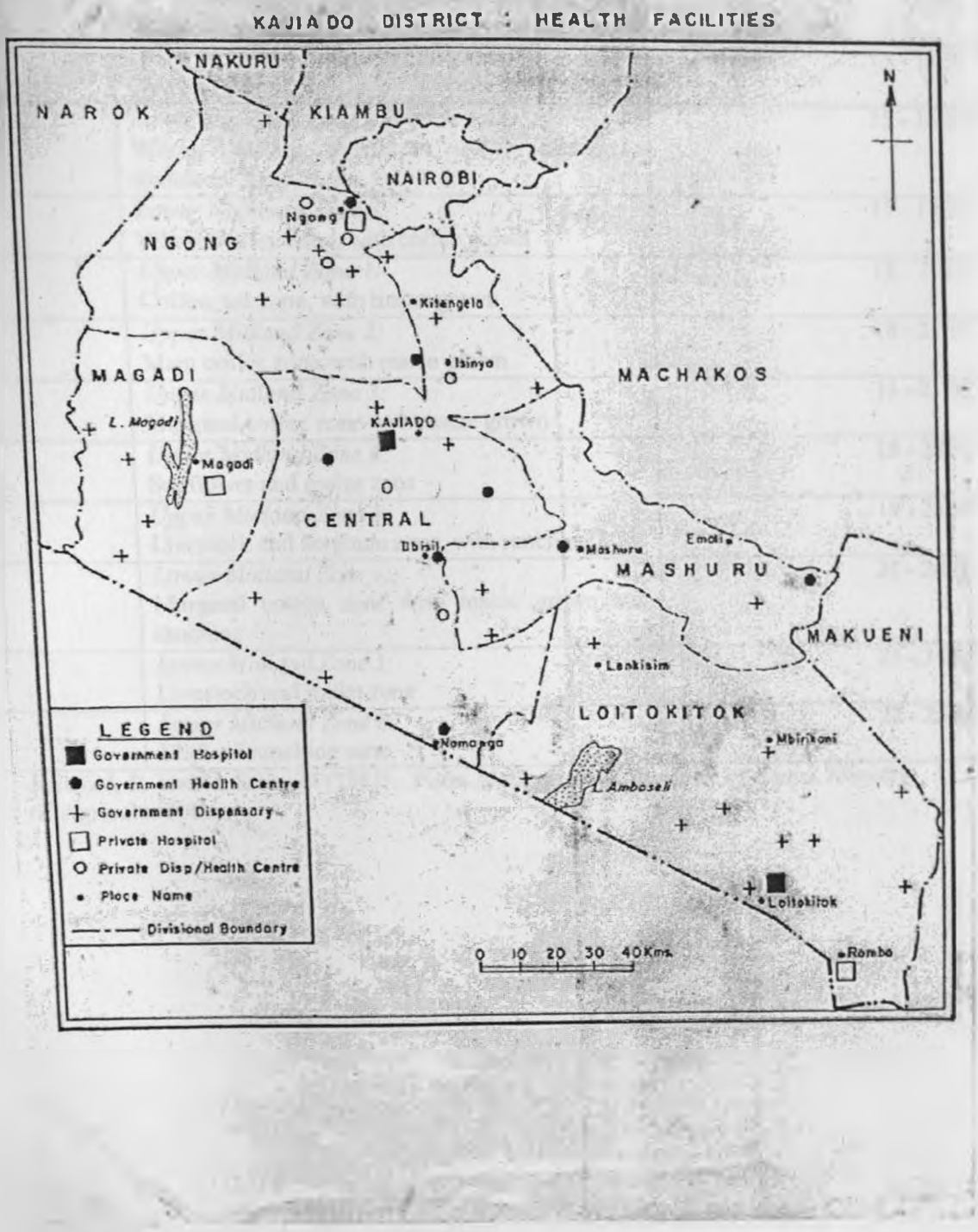


Figure 4 – Machakos District: Health Facilities

Figure 5 - Kajiado District: Health Facilities



Appendix Table 4 - Agroclimatological Zones of Kenya

Zone Code	Description and Related Economic Activities	Mean Annual Temperature Range
UH1	*Upper Highland Zone 1* (Fertile soils): Sheep and dairy zone, vegetables, maize and forests	10 - 15EC with seasonal night frosts
LH1	*Lower Highland Zone 1* (Fertile soils): Tea and dairy zone	15 - 18EC
LH2	*Lower Highland Zone 2 (Fertile soils):* Wheat, maize, pyrethrum zone; cabbages, tomatoes. Dairy zone	15 - 18EC
LH3	*Lower Highland Zone 3:* Wheat, barley zone, with coffee grown	17 - 19EC
UM1	*Upper Midland Zone 1:* Coffee, tea zone, with maize grown	18 - 21EC
UM2	*Upper Midland Zone 2:* Main coffee zone with maize grown	18 - 21EC
UM3	*Upper Midland Zone 3:* Marginal coffee zone with maize grown	18 - 21EC
UM4	*Upper Midland Zone 4:* Sunflower and maize zone	19 - 22EC
UM5	*Upper Midland Zone 5:* Livestock and sorghum zone, with ranching	19 - 23EC
LM4	*Lower Midland Zone 4:* Marginal cotton zone with maize grown and ranching	21 - 24EC
LM5	*Lower Midland Zone 5:* Livestock and millet zone	21 - 24EC
LM6	*Lower Midland Zone 6:* Midland ranching zone	22 - 25EC

Source: Jaetzold, R. and H. Schmidt (1983). *Farm Management Handbook of Kenya*, Ministry of Agriculture, Kenya.

Appendix Table 5
Yearly Stack of Facility – Specific and Catchment Area – Specific Variables (1986 –

995)

Observation (facility)	Health Service utilization	Determinants of Utilization	District
1986 1 2 3 22	Utilization levels in a facility	Utilization levels in a facility	NAIROBI
1 2 3 .. 23	Utilization levels in a facility	Utilization levels in a facility	KAJIADO
1 2 3 .. 19	Utilization levels in a facility	Utilization levels in a facility	MACHAKOS
1 2 3 .. 22	Utilization levels in a facility	Utilization levels in a facility	KIAMBU
1 2 3 .. 1995	Utilization levels in a facility	Utilization levels in a facility	NAIROBI

Appendix 2 – Questionnaire

Vector S: Provider Characteristics - Personnel

DISTRICT: _____ NAME OF CATCHMENT AREA: _____

ECOLOGICAL ZONE OF CATCHMENT AREA: _____

FACILITY TYPE: _____ (GoK / Non-GoK) FACILITY LEVEL: _____ (Hospital / Health Centre / Dispensary)

FACILITY NAME: FACILITY I.D.:

Year	No. of Doctors		No. of C.O.s		No. of Nurses		No. of Radiologists		No. of Pharmacists		No. of Lab. Technicians		No. of Support Staff (Cooks)		No. of Support Staff (Cleaners)		No. of Support Staff (Mortuary Attendant)		No. of Support Staff (Patient Attendants)		No. of Support Staff (Drivers)	
	A	S	A	S	A	S	A	S	A	S	A	S	A	S	A	S	A	S	A	S	A	S
1986																						
1987																						
1988																						
1989																						
1990																						
1991																						
1992																						
1993																						
1994																						
1995																						

Key: A = Actual S = Scheduled

Vector S - Provider Characteristics - Equipment

DISTRICT: _____ NAME OF CATCHMENT AREA: _____

ECOLOGICAL ZONE OF CATCHMENT AREA: _____

FACILITY TYPE: _____ (GoK / Non-GoK) FACILITY LEVEL: _____ (Hospital / Health Centre / Dispensary)

FACILITY NAME: FACILITY I.D.:

Year	No. of Beds		No. of Theatres		No. of Out-patient cubicles		No. of X-ray machines		No. of Microscopes		Percent of Scheduled Drugs available		Percent of Diagnostic Chemicals available		Percent availability of Surgical equipment	
	A	S	A	S	A	S	A	S	A	S	A	S	A	S	A	S
1986																
1987																
1988																
1989																
1990																
1991																
1992																
1993																
1994																
1995																

Key: A = Actual S = Scheduled

Vector A: Socio-Economic Characteristics of the Population in the Catchment Area

DISTRICT: _____ NAME OF CATCHMENT AREA: _____

ECOLOGICAL ZONE OF CATCHMENT AREA: _____

FACILITY TYPE: _____ (GoK / Non-GoK) FACILITY LEVEL: _____ (Hospital / Health Centre / Dispensary)

FACILITY NAME: _____ FACILITY I.D.: _____

Year	Average Household Size			Average Literacy Rate			Average years of Schooling			Population			No. of People below 15 years			No. of People above 15 years			Male female Sex ratio			Average age of Population		
	M	F	T	M	F	T	M	F	T	M	F	T	M	F	T	M			M	F	T	M	F	T
1986																								
1987																								
1988																								
1989																								
1990																								
1991																								
1992																								
1993																								
1994																								
1995																								

DISTRICT: _____ NAME OF CATCHMENT AREA: _____

FACILITY TYPE: _____ (GoK / Non-GoK) FACILITY LEVEL: _____ (Hospital / Health Centre / Dispensary

FACILITY NAME: FACILITY I.D.:

Year	Annual Rainfall	Annual Temperature Range	Ecological Zone	Disease most prevalent - 1	Disease most prevalent - 2	Disease most prevalent - 3	Disease most prevalent - 4	Disease most prevalent - 5	Disease most prevalent - 6	Disease most prevalent - 7	Disease most prevalent - 8
1986											
1987											
1988											
1989											
1990											
1991											
1992											
1993											
1994											
1995											

DISTRICT: _____ NAME OF CATCHMENT AREA: _____

ECOLOGICAL ZONE OF CATCHMENT AREA: _____

FACILITY TYPE: _____ (GoK / Non-GoK) FACILITY LEVEL: _____ (Hospital / Health Centre / Dispensary)

FACILITY NAME: _____ FACILITY I.D.: _____

Year	Service of Utilization Q^d	Own Service Price P_1	Price charged at nearest competing facility P_2	Distance from nearest facility D
1986				
1987				
1988				
1989				
1990				
1991				
1992				
1993				
1994				
1995				

Vector P_3, Y, W, and Other Variables in Catchment Area

DISTRICT: _____ NAME OF CATCHMENT AREA: _____

ECOLOGICAL ZONE OF CATCHMENT AREA: _____

FACILITY TYPE: _____ (GoK / Non-GoK) FACILITY LEVEL: _____ (Hospital / Health Centre / Dispensary)

FACILITY NAME: FACILITY I.D.:

Var Year	Average Price of Food P_3	Average Income Y	Wealth/Average land holding W (hectares/KShs)
1986			
1987			
1988			
1989			
1990			
1991			
1992			
1993			
1994			
1995			

Variable

DISTRICT: _____ NAME OF CATCHMENT AREA: _____

FACILITY TYPE: _____ (GoK / Non-GoK) FACILITY LEVEL: _____ (Hospital / Health Centre / Dispensary)

FACILITY NAME: _____ FACILITY I.D.: _____

Year											
1986											
1987											
1988											
1989											
1990											
1991											
1992											
1993											
1994											
1995											

Variable

DISTRICT: _____ NAME OF CATCHMENT AREA: _____

FACILITY TYPE: _____ (GoK / Non-GoK) FACILITY LEVEL: _____ (Hospital / Health Centre / Dispensary

FACILITY NAME: _____ FACILITY I.D.: _____

Year												
1986												
1987												
1988												
1989												
1990												
1991												
1992												
1993												
1994												
1995												

PANEL DATA - NAIROBI - 1986

Year	Observations	Q^d	P_1	P_2	S	Y	E	A	D	W	Z
1986	1										
	2										
	3										
	4										
	5										
	6										
	7										
	8										
	9										
	10										
	11										
	12										
	13										
	14										
	15										
	16										
	17										
	18										
	19										
	20										
	21										
	22										